UNIVERSITY OF EDUCATION, WINNEBA

PARTICIPATION OF STUDENTS WITH VISUAL IMPAIRMENTS IN PHYSICAL EDUCATION ACTIVITIES IN WENCHI METHODIST SENIOR HIGH SCHOOL, GHANA

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DECLARATION

Candidate's Declaration

I, Alice Avornyo, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE.....

DATE.....

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines for supervision of thesis as laid down by the University of Education, Winneba.

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DEDICATION

I dedicate this work to my parents Mr. and Mrs. Avornyo, for their inspirations, financial and moral support.

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ABSTRACT

The purpose of the study was to find out the extent to which students with visual impairments participate in physical education activities in Wenchi Methodist Senior High School in the Brong Ahafo region of Ghana. Data were gathered from 60 students with visual impairments and 2 physical education tutors. One-on-one interview and a close-ended questionnaire were used for the data collection. Data from the questionnaire were presented on Statistical Package for Social Sciences version 21.0 (IBM SPSS 21.0), and descriptive statistical method was used to calculate the frequency and percentages for each item-by-item analysis. The hypotheses were analyzed using the independent samples t-test. The study revealed that, students with visual impairments participated in physical education activities such as, gymnastics, ball games, athletics and physical fitness activities. Again, instruction, instructional materials and rules were adapted to suit students during physical education activities. The study further revealed that, students faced some challenges, including poor motor skills, lack of confidence, adapted materials and adapted physical environment. Again, teachers used strategies such as verbal description of words, demonstrations and peer tutoring to include students in physical education activities. Finally, human and material resources were available for students' participation. The researcher recommends that students with visual impairments should be encouraged participate in intensive physical education activities, with adaptations made to the environment, and more opportunities provided to reduce challenges among students, where one-on-one teaching and group teaching are used as a strategies to include students and more resources provided for including students in physical education activities in the school.

CHAPTER ONE

INTRODUCTION

1.0 Background to the Study

Physical education, which is one of the subjects included in the school curriculum at the secondary education level in Ghana, is intended to make students understand the importance of physical exercise, and to enable students to engage in physical education activities that lead to good healthy life and successful academic work. By the demand of Ghana's Ministry of Education (2010) the time allocated on the syllabus for physical education for senior high school students in Ghana is 80 minutes per-week. The Ghana Persons with Disabilities Act (PDA) 715 (2006) and the Ministry of Education (2013) also provided the rights for children with disabilities, including those with visual impairments, to have equal opportunities in participating in physical education activities.

The recommendation of physical activities for health promotion in children, on the other hand, requires that children should be involved in at least 60 minutes of moderate to vigorous physical activities (Council on sports medicine and fitness, council on school health, 2006). However, a research conducted by Bingham, Boddy, Ridgers and Stratton (2015) indicated that, most children with disabilities especially those with visual impairments normally engage in less than 60 minutes of the recommended physical education activities of their lesson time compared to their sighted peers.

According to Lieberman and Haibach, (2014), the education of students with visual impairments in the regular school system is becoming very effective, but mostly, the students have limited opportunities when it comes to their participation in physical education activities, whether for leisure, recreation or competition (Wiling, 2016). One

issue therefore recommended by Fragala-Pinkham, O'Neil and Haley (2010) to address this shortcoming is that, when choosing physical educational activities for all children and adolescents, it must be interesting, fun, and motivating to inspire them to participate. However, due to non-careful consideration by their sighted peers and teachers (Fragala-Pinkham et al; Rockson, 2014), students with visual impairments, in some cases, end up not being engaged in such activities.

Participation in physical education activities, as explained by the World Health Organization (WHO) (2007) is the nature and extent of a person's involvement in life situations and includes activities of self-care, mobility, socialization, education, recreation and community life. Participation in physical education activities therefore help students to build positive relationship, build positive self-esteem among themselves, enhance their mobility, reduce self-withdrawal and help them gain confidence in their day to day activities. Durstine, Painter, Franklin, Morgan, Pitetti and Roberts (2000) also noted that the main goals for the increase in physical education activities for children with visual impairments are to reduce their secondary impairment relating to mobility impairment, to improve physical functioning and the general well-being of the students

In spite of the above advantages that students stand to gain in participating in physical education activities, teachers often seem not to put much effort in modifying and adapting their instruction to meet the needs, interests and abilities of students with disabilities including those with visual impairments (Golder, Norwich & Bayliss, 2005). Block (2007) also noted that, teachers often do not involve students with visual impairments in physical education activities as done for their sighted peers. The extent to which students with visual impairments are involved in physical education activities may

also show how fast they would develop skills in the various activities. Limited involvement would also perhaps indicate that some teachers in the regular schools may have limited knowledge in adapting the activities and using the appropriate strategies to include students who are visually impaired to effectively involve them.

There are many physical education activities which students with visual impairments can participate in the regular schools if well planned (Wiling, 2016). These activities, which include physical education activities, might help in the development of physical and motor fitness and skills in dance, games and sports. Gymnastics, ball games, athletics and physical fitness activities may include some physical education activities students with visual impairment can fully participate in with their sighted mates in the regular classroom, if well adapted.

For effective participation of students with visual impairments in physical education activities, Wiling (2016) was of the views that it requires some adaptations to be made to suit their needs. Ensuring students full access to physical education activities may also require the need for use of specialized equipment. Appropriate adaptations of the activities may enhance their effective participation in such activities. In adapting some track events such as the 100 metres and 200 metres race, respectively, for example, a running guide, which is mostly made of ropes may be used to guide the students. This may be done by attaching the rope from one pole to the other with a hook along the lanes which the students trace while running towards a source of sound, being it a bell or music. Students with visual impairments can be taught various running techniques with the use of a rope, caller, human guide, treadmill, or guide wire (Lieberman, Haegele, Columna, & Conroy, 2014). Also, in adapting a game like football, five players instead of eleven players

from each team is allowed on the field (Fitzsimmons, 2007). Again, the goalkeeper is sighted and everyone on the field is blind folded. A bell is placed in the ball that allows students to know the direction the ball moves to.

The involvement of students with visual impairments in physical education has its own challenges. According to Tepfer (2002), the biggest barriers to the involvement of athletes with visual impairments in competitive sports are: (1) lack of others with who to participate, (2) lack of sighted guides, (3) limited opportunities, (4) lack of adapted material or equipment, and (5) negative perceptions of other people about athletes with visual impairments. Other challenges may include: (1) lack of specific information from instructors of the subject, (2) poor motoric skills, and (3) low self-esteem that hinders them from fully taking part in a variety of physical education activities. Nevertheless, special strategies may be used to involve students with visual impairments in physical education activities in the regular classrooms. Well-trained and well-equipped teachers, who have the knowledge and skills to teach adapted physical education to students with visual impairments, may be some of the ways to support students with visual impairments in physical education activities. According to Letcher (2016), when involving students with visual impairments in physical education activities, descriptive verbal instruction must be used; that is, teachers say what they are actually doing in body-oriented language. As a strategy, teachers give pupils with visual impairments the opportunity to participate in the activities by using the right adaptations. Research has demonstrated that significant improvements in motor activity and balance are possible for these students through training (Jazi, Purrajabi, Movahedi, & Jalali, 2012).

For effective participation of students with visual impairments in physical education activities, there may be resources available to support the needs of the students. These resources, which may be in the form of material resources and/or personnel resources, help boost students' participation. Material resources may include balls with bells, carpets, ropes, blindfolds, while human resources may include physical education teachers, orientation and mobility instructors, sighted guides and peer tutors. Several studies have been conducted on the participation of students with visual impairments in physical education activities in the regular class (Council on sports medicine and fitness, council on school health, 2006) room outside Ghana. However, it appears not much has been done concerning their participation in physical education activities in senior high schools in Ghana, whether in regular schools or special schools.

1.1 Statement of the Problem

Physical education activities are very relevant to all students including those with visual impairments. Physical education activities help all students to develop their gross and fine motor skills, such as loco motor skills, needed for fitness, wellness and independent living (Houwen, Hartman, & Visscher, 2009). However, in most regular secondary schools in Ghana, where both students with and without visual impairments are admitted, it appears students with visual impairments have little opportunities of being involved in physical education activities. Although, the special needs literature emphasizes that there is the need for physical education adaptations for students with disabilities, including those with visual impairments, it appears there is no specific adaptations made in physical education activities to accommodate students with visual impairments attending

Wenchi Methodist Senior High School. Additionally, it appears that students with visual impairments at the Wenchi Methodist Senior High School face many challenges when participating in physical education activities. In addition, it seems that teachers in the school do not use appropriate strategies that would allow the effective involvement of students with visual impairments in physical education activities. For students with visual impairments to participate fully in physical education activities requires some resources, but it appears the school lacks resources that would enable the students with visual impairments to fully participate in physical education activities.

1.2 Purpose of the Study

The purpose of the study was to find out the extent to which students with visual impairments participate in the various physical education activities in Wenchi Methodist Senior High School in the Brong Ahafo Region of Ghana. The study specifically sought to:

1. Find out the extent to which students with visual impairments participate in physical education activities in Wenchi Methodist Senior High School
2. Examine what adaptations physical education teachers make to physical education activities to suit the needs of students with visual impairments in the school.
3. Find out the challenges students with visual impairments face in participating in physical education activities in the school.
4. Identify the strategies teachers use in instructing students with visual impairments in physical education activities in the school.

5. Find out the resources available to support students with visual impairments in participating in physical education activities in the school.

1.3 Research Questions

The following research questions were raised to guide the study:

1. To what extent do students with visual impairments participate in physical education activities in Wenchi Methodist Senior High School?
2. What adaptations do physical education teachers make in physical education activities to suit the needs of students with visual impairments in the school?
3. What challenges do students with visual impairments face in participating in physical education activities in the school?
4. What strategies do teachers adopt in instructing students with visual impairments to participate in physical education activities in the school?
5. What resources are available to support students with visual impairments in participating physical education activities in Wenchi Methodist Senior High School?

Hypotheses

H_1. There is a significant difference between the extent to which students with low vision and those with blindness participate in physical education activities.

1.4 Significance of the Study

The findings of this study would provide information about the extent to which students with visual impairments participate in the various physical education activities in Wenchi Senior High School. This would enable the school authorities find means of involving students with visual impairments in physical education activities in the school. The findings, of the study would also help in providing information about the adaptations that physical education teachers make to suit the needs of students with visual impairment in Wenchi Methodist Senior High School. This would enable teachers in charge of physical education activities to re-examine those activities and adapt them to suit the needs of those with visual impairments.

The results of the study would further help in finding out any inherent challenges students with visual impairments face in their participation in physical education activities in Wenchi Methodist Senior High School. This would also enable teachers to find means of addressing any inherent challenges that the students face when participating in physical education activities. Furthermore, the findings of the study would help in finding out the strategies teachers use to instruct students with visual impairments in physical education activities in Wenchi Methodist Senior High School. This would enable the teachers to change those activities to suit the needs of those with visual impairments. Additionally, the findings of the study would again help in identifying the resources available to support the involvement of students with visual impairments in physical education activities. This would enable the school authorities to find means of providing teachers with the necessary resources that can be provided to increase the involvement of students with visual

impairments in physical education activities. Finally, the results of the study would add to the existing literature for any researcher interested in similar studies.

1.5 Delimitation

In the secondary school system, there are many activities that all students participate in, such as cultural activities, academics, and debates, among others. However, this study focused only on the participation of students with visual impairments in physical education activities with attention on only Wenchi Methodist Senior High School in the Brong Ahafo region of Ghana.

1.6 Limitations

One of the major challenges the researcher encountered during the study was the distance from where the researcher stayed and the school where the study was carried out. Another problem the researcher faced was the limited time period within which the final outcome for the study was to be submitted.

1.7 Operational Definition of Terms

Disability: It is a physical or mental condition that limits a person's movement or activities.

Visual impairment: It is the term used to describe any kind of vision loss whether total blindness or low vision

Physical education activities: They are activities that go beyond the classroom settings and that require body movement to develop physical fitness.

Adaptation: This refers to the adjustment or modifications made in activities to suit conditions of those with visual impairments and in this case physical education.

Participation: It involves the chance in taking part in an activity and in this case physical education.

1.8 Organization of the Study

The study is presented in six chapters. Chapter one of the study sets out background and the purpose of the study. It deals with the background to the study, statement of the problem, purpose of the study, and research questions and hypotheses. Other aspects of the chapter are the significance, delimitations, operational definition of terms and organization of the study. Chapter two deals with the review of related literature. It presents an overview of the theoretical perspectives and conceptual framework of the study. It also outlines what other authors or writers have written about the topic of the study. Chapter three focuses on the general methodology adopted for the study. It describes the research approach and design, the population, sample and sampling techniques, data gathering instruments, validity and reliability, pre-testing and data collection procedures of the study. Also covered in the chapter are procedures adopted for data analysis.

Further, chapter four also presented the results of the study, and in chapter five, the discussion of the findings are presented. Finally, the summary of findings, conclusions, recommendations and suggestions for further research form the concluding chapter of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section reviews related literature on the participation of students with visual impairment in physical education activities. The literature was reviewed under the following sub headings:

- Theoretical framework
- Participation of students with visual impairments in physical education activities.
- Adaptations teachers make to physical education activities for students with visual impairments.
- Challenges students with visual impairments face in participating in physical education activities.
- Strategies teachers use for involving students with visual impairments in physical education activities.
- Resources available for students with visual impairments to participate in physical education activities.

2.1 Theoretical Framework

A number of theories have been propounded about physical education activities. In this study the flow theory by Csikszentmihalyi (1975) was adopted. The flow theory deals with the intrinsic motivation that urges one to participate in an activity. Csikszentmihalyi describes the flow theory as "…the holistic experience that people feel when they act with

total involvement (p.36).” The flow theory deals with a state in which people involve themselves fully in an activity to the extent that they forget about all the external factors that may distract them. Due to how interesting the activity may be, they do it at a great cost no matter how challenging it may be (Csikszentmihalyi, 1990). The flow theory looks at the kind of inner feeling of satisfaction and joy a person gets when he or she is involved in an activity, even if the activity is challenging.

When involving students with disabilities in physical education activities, the number one factor to consider should be fun (Willing, 2016). When students are having fun they turn to forget about every other thing that may be happening around them, and they concentrate on that particular activity until the activity is done. The implication of the theory to this study is that when physical education activities are carefully selected to meet the needs of students with visual impairments, the students will be able to flow and immerse themselves fully into the activities. Moreso, when the physical education activities are well adapted to suit students with visual impairments they are able to enjoy the activities to the extent that they may forget about their disabilities and every other thing that may affect their involvement.

Secondly, with appropriate strategies, students are able to have full concentration when performing physical education activities. This also helps them to experience the flow since they may sometimes find it difficult to stop the activity because of how interesting it may be. Furthermore, the flow theory suggests that, as long as the activities are well selected, adaptations are made to the activities to suit the students and the appropriate strategies are used in involving the students, the students forget about all the challenges they may face in the activities, which also help them flow into the activities. Lastly with

appropriate resources available, students with visual impairments are able to have full concentration and flow into activities when involved in physical education since all the resources will suit their participation.

2.2 Participation of Students with Visual Impairments in Physical Education Activities

According to the Ministry of Education of Ghana (2010), physical education as a subject in Senior High School syllabus has been grouped into six thematic sections. Section one, focus on foundations of physical education and sports, section two, is on science of physical education and sport and cover the theoretical aspect of the subject, which should be taught in the classroom. Section three, includes gymnastics and dance, section four, athletics, section five, games and section six, physical fitness also cover the practical aspect of the subject which may be done on the field. The Ministry of Education (2010) further made it clear that all students must be involved in all the aspects of the physical education activities mentioned above and this does not exclude those with disabilities most especially those with visual impairments. Below are the extent to which students with visual impairments participate in the various aspect of physical education activities.

2.2.1 Participation of students in gymnastic

Gymnastics include stunts, combination of stunt activities, rhythmic activities, and traditional and social dances (Ministry of Education, 2010). Gymnastics is a major means of teaching basic motor skills and health related fitness, yet, it is very challenging to be taught inexperienced teachers (Donham-Foutch, 2007). Donham-Foutch added that, in

involving students in gymnastics, skills such as, running, jumping, hopping, leaping, sliding and galloping are very important. In addition to the above skills, Langton (2007) also mentioned skills that are needed in gymnastics, and these include; travel, weight transfer, rolling, rocking, step-like actions, flight, climbing, balance off- balance, counter-tension, counter-balance, spinning, circling, hanging, twisting, stretching, curling and swinging. Amade-Escot and Bennour (2016) also agreed with Langton when they stated that, in the national curriculum of Tunisia, some basic skills in gymnastics that students in the senior high school should be able to perform include forward and backward rolls, handstand and cartwheel.

Though gymnastics seem very difficult for students with disabilities, Ardito and Robert (2007) stated that it can be adapted to effectively involve students with visual impairments. They specifically stated that, when students with visual impairments are participating in gymnastics they may start with their hands positioned on the horse, floor competitors may also count their steps to the edge of the mat or different textured mats can be used and children on the balance beam can be warned when they are near the edge. However, Herold and Dandolo (2009) argued that during an observation in their study in a gymnastic lesson, a teacher made it clear that, centrally devised resources suitable for gymnastics were not available for involving students with visual impairments in gymnastics. The teacher further explained that, specialist worksheets for gymnastics in braille or formats that the visually impaired pupils could understand and use independently were also not available. This means that without the help of any one or the available resources, students with visual impairments may not be able to participate effectively in gymnastics.

Most students seem to withdraw themselves when it comes to their participation in gymnastics, which may be as a result of the activity being too difficult and does not involve fun activities (Fromel, Formankova, & Sallis, 2002). However, Morley, Bailey, Tan and Cooke (2015) conducted a study on teachers' views of including pupils with special educational needs and or disabilities in physical education. The study was done qualitatively with purposive sampling as the sampling technique and interview was also used as the tool for collecting the data. One teacher each was selected from 43 states secondary schools in a large city in the North of England. The findings of the study revealed that gymnastics was one of the activities that pupils with special educational needs were easily included in the mainstream settings.

2.2.2 Participation of students in ball games

Ball games, which students are usually involved in the senior high schools in Ghana, may include football, volleyball, handball, badminton, table tennis, tennis, netball and hockey, and may be found in the physical education curriculum to create fun and enjoyment among students. Sit, Lindner and Sherrill (2002), however, noted that students with disabilities mostly prefer games such as basketball, soccer, goalball and badminton to other games. Pandey and Sardar (2015) also pointed out that, when students are involved in court and field games such as handball, football, volleyball, basketball and hockey, they tend to develop their strength and speed.

One of the ball games, which is goalball, is a game specially designed for the full participation of people with visual impairments (Ardito & Roberts, 2007; International Blind Sports Federation, 2014). A study conducted by Gomes-da-Silva, Albuquerque de

Almeida and Antério (2015) on bodily communication in the game of goalball, revealed that goalball was an educational game in which its coordination and communication is complex. Further, when students were engaged in goalball, it allowed them to extend their attention to their whole body. The study was a qualitative one with a descriptive design. From a population of four male and female teams, with the male team consisting of 22 athletes were purposively sampled. The data were also collected through interview. It was finally recommended that the game of goalball should involve sighted students as well.

Leiberman, Robinson and Rollheiser (2006) also conducted another study on the experiences of youth with visual impairments in general physical education classroom and it was revealed that students with visual impairments were denied participation in physical activities such as football, because the activities were not modified to suit them. A similar study by Dakwa (2011) on the reflection of teachers' perceptions on the inclusion of children with visual impairments in ordinary schools in three schools in Masvingo District in Zimbabwe revealed that students with visual impairments were involved in only paper football and volleyball, though sports activities were the least they participated in the schools. The researcher purposefully used a questionnaire to sample 15 teachers who taught students with visual impairments in the district.

2.2.3 Participation of students in athletics

People with visual impairments may be able to take part in many athletics such a javelin, shot put, club throwing, running, high jump and long jump. These events have been practiced by athletes who are visually impaired for many years now (Sani, 2014). Based on history, athletics was not included in Olympic Games until 1896 in Athens (Errey,

2016). Women were also not allowed to participate in track and field events until 1928 in Amsterdam. However, athletics which include track and field events were adapted to suit athletes with visual impairments in 1970 (Blazesport America, 2012). Blazesports America further mentioned similar track and field activities that people with disabilities, including those with visual impairments, can participate in but added that some adaptations were made to the events where necessary, which sometimes made the rules more flexible. According to Errey, modern athletic events normally take place around a 400 metre running track on which most of the running events take place. Errey added that, the field events such as jumping and throwing also often take place inside the track.

Sprint is a track event in athletics which seem to be enjoyed by many students including those with disabilities. Montagnino (2001) stated that sprint for students with visual impairments requires a sighted guide trained by a teacher, the tether method and independent running where the student runs independently without contacting the guide, but rather depends on the verbal cues of a guide running behind him or her. With the use of a guide runner or a sighted guide, the student with visual impairments and the guide runner may each hold the end or loop of a flexible piece of material (Montagnino, 2001). United States Association of Blind Athletes [USABA] (2016) also added that for students with visual impairments to run well there is the need for a guide runner. Also Montagnino pointed out that, a student with visual impairments who is a sprinter may be able to run to a caller independently for a short distance without getting into contact with anyone. Again, the USABA suggested that for a 50-metre race, a caller may be placed behind the finishing line, facing the runner in the fourth lane.

Relay running, which is also a track event in athletics, may also be adapted for students with visual impairments to successfully participate. The relay running for students with visual impairments will require some adaptation due to the difficulties students may face during the baton exchange (USABA, 2016). The USABA therefore suggested that, increased communication between the runners and a modified hand-off may be used to help them participate effectively. They added that for the runner to know where his or her partner is, the waiting runner has to yell the runners' name.

Field events may include long jump which can also be called broad jump (Naskar & Mondal, 2015), and may be in the form of running long jump and standing long jump or standing broad jump. In standing long jump, students may be assisted by teachers if the need arises. Students with visual impairments may participate in these events with little modification through verbal cues. But for those who cannot do it at all, teachers may have to provide assistance. Farrenkof and Mcgregory (2000) suggested that when assisting students with visual impairments, who need more help in long jump, two teachers, one holding the student's left arm and the other teacher holding the right arm, assist the student, to swing his or her arms as he or she prepares to jump, the teachers support the student by guiding his hand and arm and forward while he or she lands in a sand pit.

Gawlik and Zwierzchowska (2006) conducted a research on a comparison of chosen strength abilities in adolescents with deafness and blindness, respectively. The participants consisted of adolescents with blindness in group B and adolescents with deafness in group D, as well as 16-17 year-old healthy subjects who formed the control (C) group. All the groups were selected purposefully because the researchers selected only adolescents who were completely blind since birth and adolescents with deafness above

80dB. One of the results revealed that in standing long jump, the adolescents with blindness (both boys and girls of the same age) performed poorly compared to the adolescents who were deaf. The boys with deafness were also close to those of healthy boys. The results of females with deafness were rather poor. The adolescents who were blind were significantly worse in the standing long jump in comparison to the healthy subjects. The researchers recommended that for running long jumps, students with visual impairments may run the length of the ramp and then jump without anyone's help with the use of a verbal cue. Farrenkof and Mcgregory (2000) added that for students with low vision, the ramp could be highlighted with a florescent chalk along the vertical line to show where the students should run.

Moreso, the USABA (2016) also stated that one of the main challenges students with visual impairments face in high jump is their inability to locate the crossbar. They therefore suggested that for students with blindness a high jump may be done successfully by placing raised starting marks on the runway which will be followed by the students practicing the number of steps to take before jumping. They further noted that beeper or other sound sources may be hanged on the bar or crossbar. They again added that learning to jump in this event is the most difficult and will require breaking down the steps into simpler form, starting first with no crossbar and working up to using one. Also, the USABA suggested that, for students with low vision, the crossbar can be striped black and white or by hanging strips of bright orange tape from the crossbar.

In high jumping for students with visual impairments, the use of a one-step approach is more appropriate (Montagnino, 2001). The author added that, the hop, step, and jump can be attempted from a standing start. Furthermore, Montagnino concluded that

provision of sound source from the direction the students should move to is also very necessary.

2.2.4. Participation of students in physical fitness activities

Physical fitness is the ability of a person to perform daily tasks regularly and still has more energy left for recreation and leisure activities (Ministry of Education, 2010). Physical fitness may include all the physical activities that make students fit to perform physical education activities. Both students with visual impairments and those without visual impairments may perform physical fitness activities effectively when involved, even though, one of the characteristics of students with visual impairments is that their physical fitness levels is below that of their sighted peers (Wind Gap Middle School, 2016). Lieberman (2002) pointed out that many people with visual impairments face various challenges when socializing with other people in the community when it comes to recreation and fitness activities. Lieberman, Stuart, Hand and Robinson (2006) however argued that students with visual impairments are able to reach the level of physical fitness that can be compared to their sighted peers when they are allowed to participate in physical education activities. Also, Caliskan, Karagözoglu, Kayapinar, Erzeybek, and Fisekcioglu (2007) pointed out that though students with visual impairments have lower levels of physical fitness, there are some students with visual impairments whose physical fitness levels are higher than their sighted peers. Hopkins, Gaeta, Thomas, and Hill (1987) carried out a study on physical fitness of blind and sighted children. With a random sampling technique, the researcher selected 27 students with blindness, they used a questionnaire to assess both students with visual impairments and those without visual impairments in

physical fitness. The findings revealed that students with visual impairments were less fit compared to their sighted peers due to their lower level of regular engagement in physical education activities.

Another study conducted by Szekeres and Dorogi (2002) confirmed that people who participate in sports on regular basis do not only experience an increased level of physical fitness but also become more self-sufficient and are able to perform better than before. Such people may include people with visual impairments. A study conducted by Colak, Bamac, Ayin, Meric, and Ozbek (2004) on physical fitness levels of players with blindness and visual impairments on goalball team found that students who were goalball players were significantly physically active than their peers who did not play in the goalball team. In this study, the authors used a quantitative approach and survey that involved 130 participants with visual impairments, who were volunteers with 51 goalball players, and 53 people who were not goalball players. The researchers used the non-parametric statistics to gather the information from the participants. The researchers recommended that sports should be used as a rehabilitation method for students with blindness to develop their physical capacities and have a better control over their body.

Furthermore, Demirturk and Kaya (2015) conducted a study on physical education lessons and activity status of adolescents with visually impairments and sighted adolescents in a secondary school for the students with visual impairments in Tokat, Turkey. The study was conducted on 53 adolescents that comprised of 22 adolescents with visual impairments and 31 sighted adolescents. A questionnaire was used as the main data collection too. The study revealed that, the activity level of children with total blindness was lower than that of children with low vision. It was recommended that, children in the secondary school,

especially those who are visually impaired, should be motivated and encouraged to take part in various sports or physical activities to help them increase their activity levels to the recommended levels that promote health benefits.

2.3 Adaptations made to Physical Education Activities to suit the needs of Students with Visual Impairments

Most students with special needs are able to take part in unhindered general physical education activities, but the programmes of students with visual impairments typically need some modifications for them to successfully participate (Sherrill, 2004). These modifications may include a guide or peer tutor, beeper or bell balls, or various textured items that would be specifically addressed when considering accommodations (Lieberman, 1996). The main purpose for providing adaptations to students with disabilities is to promote equal opportunities and avoid discrimination (Petrie, Power, & Swallow, 2009).

According to Montagnino (2001), for students with visual impairments to participate fully in physical education activities, the instruction, the materials or equipment, environment and the rules in the game must be adapted. Thus, people with disabilities can successfully participate in general physical education activities if the rules are modified, cues are provided, equipment is changed, the students are permitted to play specific position in a team or are provided with peer tutors or buddies (Motorn et al., 2012).Without the adaptation of the environment where the activity is going to take place, materials that are going to be used for the activities, the instructional strategies that the teachers will use in involving the students in the activities, and the rules that guide the activities, students

may totally be neglected when it comes to their participation in physical education activities.

A study carried out by Wanjiku (2014) on teaching strategies used by teachers to enhance learning among learners with multiple disabilities in four selected counties in Kenya, revealed that, majority of teachers (85.7%) who taught learners with autism and blindness suggested that they needed training in all areas of disabilities including autism and knowledge on instructional techniques, curriculum adaptations, assessment and evaluation. In that study, the triangulation via mixed methods design was adopted for nine schools that were purposively selected from 14 schools that had learners with disabilities. The targeted population, however, was 123 teachers and head teachers from which 66 participants (9 head teachers and 57 teachers) were selected for the study. Wanjiku therefore suggested that, for improvement in teaching of learners with multiple disabilities, learners should be provided with an adapted or a specialised curriculum, provision of adequate teaching resources, IEP to be designed by a multidisciplinary team and all teachers to be given further training on how to differentiate instruction for learners with multiple disabilities.

According to the American Association for Physical Activity and Recreation/ National Association for Adapted Physical Education Services (2010) some students with disabilities may benefit from adapted physical education class, while others may be able to participate in a regular physical education class using modifications and adaptations when necessary. Furthermore, when adapting physical activities instructors should rely on tactile cues, auditory cues, and visual cues (Arditor & Roberts, 2007). There are various types of adaptations to be made in physical education activities which are;

2.3.1 Adaptations made to instructions

Most physical education activities may be enjoyed by students with special needs including those with visual impairments, if the instructions are well adapted. Students with disabilities find it extremely difficult to learn when instruction is not simplified and presented in concrete terms. In other words, students with disabilities find it difficult to complete tasks given to them due to lack of clarity, but not because they are being to physically perform the activities (Faison-Hodge & Porretta, 2004). Smit and Humpert (2012) added that students who receive differentiated instruction (adapted experience high achievements. The findings from a study conducted by Koeze (2007) in Michigan, also showed that differentiated instructional strategies of choice and interest played a very important role in achievement and student satisfaction in learning. The purpose Koeze's study was to determine if differentiated instruction had an effect on students' achievement. The mixed method design made of qualitative method and quantitative methods was used as an approach for the study. Data were collected on the 27 participants in the study from surveys, test scores, classroom observations, and interviews. Though this study was mainly conducted on students without visual impairments, conclusions drawn from the findings may be applicable to students with visual impairments.

Winnick (2011) stated that when adapting instruction for a game like softball for students with disabilities, physical assistance, peer tutors, teaching in braille, task analysis, sign language, hand signal, verbal cues, demonstrations, auditory cues and one-on-one instruction are very necessary. Montagnino (2001) also noted that, when students are participating in physical activities, explicit body-oriented instructions such as, "to your left", "Pull elbow into sides", "reach forward and then up", must be given. Montagnino

again added that, when involving students in group games such as soccer, specific instructions must be given to the students. First of all, students who are blind must be warned of an upcoming pass. For example, “get ready”, “pause”, “catch”, and then “pass the ball”. The use of bounce pass gives an additional warning when passing balls. British Blind Sport (2016) also asserted that in running, the guide needs to describe the running environment out loud for the person with visual impairments. For instance “Left turn 10m”, “ramp” “tree root” and countdown to inform of approaching obstacles such as “kerb in 5, 4, 3, 2, 1” must be used.

Letcher (2016) also stressed that, when teaching throwing and catching, the teacher must give the receiver a sound clue, the ball must be bounced instead of throwing it directly, different types of balls, such as nerf or fluff must also be used to lessen the impact when hitting with the ball. Ontario Curriculum (2005) argued that before every activity starts, instructors must ensure that students’ undivided attentions are gotten before the instructions begins. When teachers are giving instructions in physical education classes, students are expected to pay attention while he or she speaks to the class (Diedrich, 2010).

Igune (2009), however, pointed out that some teachers lacked skills and competence in adapting their instruction to meet the needs of children who are blind. In support of this, a study conducted by Alhassan and Abosi (2014) on how teachers adapt instruction to suit pupils with learning disabilities in the regular classroom indicated that, regular teachers have limited to moderate competence in adapting instruction. Yet, another finding from the same study also showed that adapted instructions were very necessary for the competence domain of students with learning disabilities for their effective inclusion into the regular classroom. The authors’ study adopted the mixed-method approach, and

used descriptive and correlational survey design in which 387 randomly selected teachers participated. Data were collected through the use of a questionnaire and observation.

According to Agbenyega and Deku (2011), for an effective inclusion of both students with disabilities and those without disabilities in Ghana to be successful, there is the need for teachers to change their classroom practices through the use of adaptive instructional practices. However, most teachers find it very difficult to adapt their instruction in inclusive classroom (Hodge, Ammah, Casebolt, Lamaster, & O'Sullivan, 2004).

2.3.2 Adaptations made to instructional materials

One of the things to consider when involving students with visual impairments in physical education activities may be the materials or equipment used. Activities such as basketball, soccer, football, hockey, lacrosse, volleyball, tennis, and badminton in the traditional format cannot be played independently by students with visual impairments without any adaptation (Lieberman & Houston-Wilson, 1999). The U.S. Department of Education (2011) also added that, with appropriate equipment, children and youth with disabilities are able to participate in physical activities. The above suggests that some physical education activities need intensive material adaptations to enable the full participation of students with special needs.

Some materials such as beeper balls and goals, bell balls, larger and brighter materials, and guide ropes for running may benefit some students with visual impairments since most of them produce sound or speech for effective participation (Letcher, 2016). Foley, Lieberman and Wood (2008) also mentioned similar materials but added that a

sound source behind baskets or goals, bells on nets, bright, easily identifiable pinnies to wear when playing a game, and ropes taped on the floor to mark boundaries or activity areas help improve on students participation in physical education activities. This explains what Ocloo (2011) noted that, teaching and learning materials for children with visual impairments must have some unique characteristics which comprise accurate information and must be appropriate to the lesson and the age of the children involved.

A research conducted by Lieberman et al., (2006) on adolescents with visual impairments' experiences in general physical education classes showed that students with visual impairments were often not involved in physical education activities because of their visual impairments or the teachers did not have the appropriate equipment that they could use to enhance student participation. Lieberman et al.noted that, the games and sports that were introduced in physical education classes were group activities such as baseball, football and soccer and were not modified for students with visual impairments to effectively participate.

Igune (2009) also indicated that appropriate materials provide learners with visual impairments with tactile skills that help them to explore and describe activities being learnt and provide meaning to new knowledge. Foley et al. (2008), also stressed that the more children with visual impairments engage in class activities, the more they increase in their daily step counts. This means that if the balls are not well adapted, students may not be able to participate effectively in physical activities. According to Simpkin (1998), when planning games, it is very important to adapt the materials from local resources. These material resources may include targets, balls, bean bags and markers.

Herold and Dandolo (2009) conducted a study on the experiences of teachers and pupils in including students with impairments in physical education lessons. A case study design was used for the study. Out of 260 children with moderate learning difficulties, one student with visual impairment was sampled. Data were collected using a semi-structured interview instrument and field observation. The findings revealed that the pupil with visual impairments sometimes experienced inequitable learning situations, because the teacher used and adapted general inclusion materials for learning that was not favourable to the student. It was recommended that resources needed for including students with visual impairments should be audited systematically and further development of central and accessible learning resource bases, including more advanced learning resources, should be considered.

2.3.3 Adaptations made to physical environment

The environment in which adapted physical education is provided will vary depending on the needs of the student (Winnick, 2005). Corn, Anderson, Bachofer, Jose and Perez (2003) mentioned five major environmental scopes that can be adapted to assist students with visual impairments to access their environment through the use of vision which include colour, contrast, time, illumination and space. In physical education, the environment must be free of obstacles that may prevent students with visual impairment from moving around. Students with disabilities are to receive the same amount of physical education as their peers of the same age **(**Lieberman & Houston-Wilson, 1999), therefore the environment in which the activities are going to take must be adapted to suit the students so that they can also benefit. However**,** Akandere (2006) noted that, games and sports

activities are the most important ways through which a child explores and interiorizes the environment.

According to Ontario Curriculum (2005), clear visual cues such as lines on floor must be used to help identify boundaries when involving the learners with visual impairments in physical education activities. In support of this, Letcher (2016) also explained further, that when adapting the environment, in terms of the boundaries, the floor texture must be changed. For example, a rug or rubber polydot must be used on the floor to mark space where exercises are done. Again, a rubber carpet runner must also be placed next to the wall so that when the child steps onto the surface, he will know that he has stepped out of bounds. Letcher, further explained that, the change in surface also signals a warning to the student that a wall or object is coming up so he needs to slow down and stop.

Montagnino (2001) also noted that when adapting the environment for effective participation by learners who are blind, the floor texture must be changed by placing a rubber carpet runner or tumbling mats next the boundaries so that when the child steps on it, it will signal to him that he is stepping out of the boundary. The author again, added that when the surface is changed it gives a clue to the child not to go closer to the boundaries. According to Wiling (2016) playground orientation is very necessary for students with visual impairments. The author added that the orientation may be done when the playground is very quiet and when other students are not on the playground so that the students can tactually explore and locate where the equipment are and to learn how they move.

Boateng (2007) conducted a study on the strategies for including the individuals who are physically challenged in mainstream schools in Ghana. Thirty-five were interviewed and observed regarding strategies that teachers used when teaching students with physical disabilities. The findings of the study revealed that students found it difficult to move around freely in the environment due to restrictions such as stones, potholes and open gutters in the schools. The researcher therefore recommended that adaptations should be made to the environment for easy movement among students with physical disabilities.

2.3.4 Adaptations made to rules

Montagnino (2001) mentioned that rules may be modified to accommodate visual limitations, but teachers must be careful not to alter the basic structure of the games. For example, in volleyball, the ball may be permitted to bounce once, or the student who is blind or visually impaired may take one serve before each team begins serving. Again, students with visual impairments or blindness may want the activity to remain as close to its original form as possible, therefore care must be taken when adapting the rules.

In adapting the rules of a particular game, smaller field and fewer participants are considered (Luo, 2000). Again, most sports for individuals with disabilities are normally played using International Federation of Association Football (FIFA) rules and may include modifications of the field of play, equipment, numbers of players and other rules that are required to make the game suitable for the participants (Beras, 2013). For example, in adapting the rules of a game, such as football, the number of players may be reduced to 5 players. Winnick (2011) also mentioned that adapting the rules of the game of softball may include, hit off a tee, five-strike rule, no strike out, three swings and no strikes and

running with a partner or a guide. Yet, British Blind Sport (2015) argued that with the use of guides in running events, the rule allows only B1 and B2 runners to use sighted guides. According to the British Blind Sport (2015), B1 runners are runners who have visual acuity of no light perception up to hand movement, while B2 runners are runners whose visual acuity would enable them to count fingers at any distance.

Ardito and Roberts (2007) noted that in adapting physical education activities for successful involvement of students with visual impairments in physical education, the adaptation of the rules of games, such as soccer, for inclusion of both sighted students and students with visual impairments is one of the techniques to consider. The authors further stressed that when games are broken down into their component parts and the rules are modified, students with visual impairments can practice each major skills that are given to them. When sighted students are participating in group or individual games with their peers who are visually impaired, the rules may be adapted to suit both of them. However, Australian Sport Commission (2016) argued that, in modifying the rules of a game, it may not be necessary to modify the game's rules or equipment for everybody because of one person with a disability, the change can be made to suit only that person.

In view of the above findings, Perlman and Piletic (2012) conducted a study in which a participant observed that when rules are changed in sporting activities for students with disabilities, they participate in games that make them feel part of the activities. The purpose of that study was to investigate the influence of an adapted physical education course on preservice teachers' instruction using a self-determination lens. The participants for the study were 46 pre-service physical education student teachers. Data were collected

using qualitative measures of scenario responses, reflections and peer observations, and were analyzed using the constant-comparative method.

2.4 Challenges of Students with Visual Impairments in Physical Education Activities

A number of challenges exist that make the participation of students with visual impairments in physical education activities very difficult. International Platform on Sport and Development [IPSD] (2016) stressed that people with disabilities in developing countries face a lot of challenges when participating in sporting activities. Rimmer (2008) found out that lack of transportation to fitness centres, lack of information on available accessible facilities and programmes, lack of equipment and perception of unfriendly environment were some challenges some adults with disabilities faced that made it difficult for them to participate in physical education activities.

Coakley and Donnelly (2004) cited in Barayagwiza (2011) also noted that:

> the sport preferences are influenced by various factors that include (i) the personal preference of the person; an emphasis on enjoyment and participation in a sport that stimulates the person may be important for continued participation, (ii) the characteristics of the sport; physiological demands, collision potential, team or individual, coordination requirements, (iii) the medical condition; beneficial and detrimental aspects, (iv) conditions associated with the condition; although motor dysfunction may initially appear to be the major limitation to participation there may be for example an associated cardiac condition to consider, (v) the cognitive ability and social skills of the person; ability to follow rules and interact

> with others, (vi) availability of facilities, (vii) availability of appropriate coaching and support staff; for example, lifting and handling, (vii) equipment availability and cost; as disability sport has evolved, so has the technology (pp. 31-32).

Kentiba (2013) conducted a research on the problems and challenges affecting the participation of students with disabilities in physical education activities in a regular classroom in Ethiopia. The author used a mixed method approach that involved 43 participants, who responded to a questionnaire, were interviewed and observed as part of the data collection procedure. The findings revealed some challenges that students with disabilities faced when participating in physical education activities, which included: (1) lack of equipment, (2) inaccessible school compound, (3) absence of disability sport competitions, (4) poor pupil-to-pupil support, (5) limited professional development trainings, and (6) incomprehensive curriculum. The researcher therefore suggested that, curriculum experts and policy-makers must ensure that teaching materials are available to suit students with disabilities in inclusive classrooms. Secondly, physical education teachers should encourage pupils-to-pupils' interaction through play or other means.

Gondo and Gondo (2013) conducted a similar study in Zimbabwe that involved 15 participants from two universities. In that study, the participants responded to an open-ended questionnaire regarding challenges that students with disabilities faced when attempting to participate in physical education activities. The authors found that practical activities in physical education as a subject was generalized in nature and activities were not adapted to suit students with disabilities, which was a major requirement in integrated schools. Additionally, specialized equipment to cater for the needs of students with

disabilities was not readily available. Also, the students with visual impairments found it difficult to involve themselves because braille modules were not easily available on registration and were only produced on request. The researcher recommended that students with disabilities should be given special opportunities through the provision of specialized equipment. These finding corroborate conclusions by Gosch, Bambring, Gennat, and Rohlmann (1997) that, these challenges mostly seem to discourage students with visual impairments from participating in physical education activities since they have limited opportunities to engage in physical activities that sighted children participate in.

2.4.1 Poor motor skills development

Motor development is defined as the development of the muscles and bones of a person and the ability of the person to manipulate his or her environment (Boskic, 2010). There are two types of motor development; namely, fine motor development and gross motor development. Fine motor development describes the skills and activities that deal with the use of hands and fingers (Amundson & Weil, 2001), while Boskic explains gross motor development as the development of the large muscles in the human body which may include walking, running, jumping and balance.

Magill (2007) noted that, interaction with the environment and direct interactions with people help develop motor skills among students with visual impairments. Though the development of motor skills among students with visual impairments is very essential for their active participation in physical education activities, they mostly seem very limited in interacting with the environment, including direct interaction with the people around them. According to Poulsen, Ziviani, Johnson and Cuskelly, (2008), and Houwen,

Visscher, Lemmink, and Hartman (2009b), motor skills play a crucial role in the social and emotional functioning of students and may impact their quality of life and wellbeing. However, for most students with visual impairments, developing the motor skills for participating in physical education may be a very big challenge, especially for students who are totally blind. This seems to make them not to have enough confidence when participating in physical education activities and, therefore, leads to withdrawal. Skinner and Piek (2001) cited in Houwen, Visscher, Lemmink and Hartman further explained that poor performance in physical activities may be as a result of poor motor development, which may further reduce the competence level of students. One of the reasons why most students with visual impairments have poor physical conditioning and motor abilities is because they are mostly not included in activities with their peers (Lieberman & McHugh, 2001).

Fitness level and motor skill development of children with visual impairments is often found to be lower in level and less compared to their sighted peers (O'Connell, Lieberman & Peterson, 2006). In support of this statement, Williams, Pfeiffer, O'Neill, Dowda, McIver et al. (2008) argued that preschool children with poorer motor skills performance were less active than children whose motor skills are more developed. They concluded that health of children, most importantly; obesity could be prevented as a result of the relationship that exists between motor skill performance and physical activities. The purpose of the study was to examine the relationship between motor skill performance and physical activity in preschool children. Participants were 80 children who were 3 years old and 118 children who were 4 years old. *Motor Skill Protocol* was used to assess the process characteristics of six locomotors and six object control skills, which included locomotors,

object control and total. They suggested that clinicians should work with parents to monitor motor skills and to encourage children to engage in activities that promote motor skill performance. However, Oosthuizen (2010) stated that when children are underdeveloped before the age of two, their motor development is mostly poor.

According to Smith, Nolen-Hoeksema, Fredrickson and Loftus (2003) cited in López-Justicia and Cordoba (2006), low self-esteem can affect the development of physical and mental wellbeing of a person which can result in isolation and depression. The findings from a study conducted by Fotiadou, Christodoulou, Soulis, Tsimaras and Mousouli (2014) indicated that children and adolescents with visual impairments scored lower on motor development and self-esteem than their sighted peers. The purpose of the study was to evaluate and investigate the relationship between motor development and self-esteem of adolescent with visual impairments. Thirty-seven participants, aged 8 years to14 years-old, responded to the Cooper Smith Self-assessment Instrument to measure the respondents' self-esteem, while the Bruininks-Oseretsky Test of Motor Proficiency was used to assess the motor development of the respondents. The researcher concluded that, it was very important for all those involved in the treatment and education of children with visual impairments to assist in promoting motor development and instill a sense of confidence very early in them.

Students with visual impairments may not participate in physical education activities because of the perception they may have about their motor skills development during physical education activities. Not being able to move around independently and freely may discourage students from taking part in physical activities. According to

Lubans, Morgan, Cliff, Barnett, and Okely (2010), poor motor skills are mostly associated with low perceptions of physical competence.

Brian, Haegele and Bostick (2016) carried out an investigation on the perceived motor competence (PMC) of children with visual impairments. The purposes of this study were to examine the association between visual impairment level and PMC scores for children ages 3 to 13 years old, and the association between PMC and physical activity (PA) of children with visual impairments. The participants included 13 recruited children from a center for the blind in a southern location within the United States who were purposively sampled for the study, because they were documented as having visual impairments and within the ages between 3 and 13 years old. A specialized expertise in motor development, adapted physical education focusing on visual impairments, and a professional development/teacher education of teachers of visual impairments were used by the authors for the study. The findings of the study showed that the participants demonstrated very poor levels of perceived motor competence. The researchers suggested that, practitioners such as physical education teachers, recreation therapists, and orientations and mobility instructors should provide meaningful and successful physical activity experiences at this critical time to continue to promote activities that will reduce lower perceived motor competence.

Lieberman, Haibach and Wagne (2014) also conducted a research on *let's play together*: sports equipment for children with and without visual impairments. The purpose of the study was to determine whether gross motor skill performance of sighted children varies depending on the equipment used. The participants included 28 sighted students within the age of 6 to 12 years who were recruited from a local school district. The test of

Gross Motor Development II was used to evaluate the gross motor performance of the participants. A qualitative approach was used with observation as the main instrument. The findings revealed that modified equipment did not interfere with gross motor skill performance of students who were sighted.

2.4.2 Lack of confidence

According to Mishra (2013), self-concept and self-confidence are two very important things which help in the overall development of the personality of people. Lack of confidence may happen among students with visual impairments because of few academic opportunities given to them to participate in physical education activities (Lieberman & Houston-Wilson 1999). Harter (1990) cited in Zwald (2008) stated that a high level of physical competence seems to reinforce positive self-confidence and contributes to more positive self-confidence. Yet, a comparative study conducted by Mishra and Singh (2012) on the self-concept and self-confidence of sighted children and children with visual impairments revealed that, students with visual impairments were found to have average self-confidence. Mishra and Singh recorded that 64% of the respondents had average to high self-confidence and 35% of the respondents had very low self-confidence. The researchers used a descriptive survey method and sampled 200 students with and without visual impairments in some schools in Delhi, India. The Self-Concept Inventory was used to measure the self-concept while Self-Confidence Inventory was also used to measure the self-confidence. After comparing the level of confidence between students with visual impairments and their sighted peers, the sighted and the visually impaired, the researchers realized that the students with visual impairments had

lower self-confidence compared to their sighted peers. The authors therefore suggested that ample opportunities should be given to students with visual impairments to develop educationally, socially and emotionally. Mishra and Singh indicated that these will help children with visually impairments to build on their self-concept and self-confidence.

One of the findings from another study on self–concept Mishra (2013) in relation to ego-strength of sighted students and their peers who are visually impaired in Chandigarh and Haryana in India revealed that, sighted students have higher self-concept than students with visual impairments. The researcher used descriptive survey and purposively sampled 40 students with visual impairments and 40 sighted students. A Children's self-concept scale and Ego-strength were used as the tools for collecting the data. Mishra recommended that teachers should create conducive environments, better interaction opportunities, and self-confidence in students with visual impairments in order to improve their self-concept and ego-strength.

Furthermore, Stuart (1998; cited in Lieberman & Houston-Wilson, 1999) conducted and interview with 35 students with visual impairments participating in a developmental sports camp, revealed the following reasons why students with visual impairment refrain from participating in physical activities: (1) low skill levels and fear of ridicule, (2) fear of losing the game for their team, or (3) fear of hurting themselves or others. Roy (2007) stressed that, sport is well suited to helping persons with disabilities acquire social skills they may be lacking. Self-confidence which helps boost these social skills maybe very necessary in the lives of students with visual impairments. Lieberman and Houston-Wilson explained that high level of physical education capabilities help to

sustain positive self-confidence and contribute to more positive self-esteem in children with visual impairments.

2.4.3 Lack of trained tutors

Block (2007) stressed that, one of the challenges students with visual impairments face is that, physical educators may not have adequate knowledge about how to teach adapted physical education skills since there are limited programmes for training teachers in content regarding learners who are visually impaired. Perkins, Columna, Lieberman and Bailey (2013) agreed with Block's findings when they conducted a study on parents' perceptions of physical activities for their children with visual impairments. The study was a qualitative study in which 11 parents of students with visual impairments were the participants. Data were collected through interviews with the parents. The researchers found that lack of opportunities for active participation, poor communication with the physical education teachers, and lack of training of the physical education teachers working with students with visual impairments were some of the main barriers for involving students with visual impairments in physical activities. Kozub and Oh (2004) added that one of the challenges students with visual impairments face when participating in physical education activities is the lack of effective instruction and practice from instructors.

Lieberman and Houston-Willson (1999) also noted that most teachers and students feel that lack of professional preparation prevents students with visual impairments from actively taking part in physical education. Furthermore, teachers sometimes seem not to have much idea about adapted physical education for students who are blind, and this may be because most of them have not received enough training to effectively involve students

with visual impairment in physical education activities. They therefore suggested that professional preparation and in-service training for practicing teachers should be improved by providing information about approaches that could be used to include students with visual impairments in the main content of the curriculum. Similarly, Ammah and Hodge (2006) stressed that, sometimes trained physical education teachers feel unprepared to adapt physical activities for people with disabilities.

Wischochil, Lieberman, Houston-Wilson and Peterson (2007) argued that, the need for one-on-one instruction is necessary for students with visual impairments to understand the skills needed to be successful in physical activities. Yet, the fact that teachers are not effectively prepared for physical activities often leads to the exclusion of students with disabilities from their classes (Stuart, Lieberman, & Hand, 2007), which in turn may lead to teachers not giving students the one-on-one instruction they need. Shields and Synnot (2016) carried out a study on perceived barriers and facilitators to participation in physical activity for children with disabilities. Sixty participants (23 children with disabilities, 20 parents, and 20 sport and recreation staff) participated in a qualitative study that used focus group interview for data collection. Shields and Synnot found that, children with disabilities faced many challenges which included lack of instructor skills and unwillingness of instructors to include the students with disabilities, negative societal attitudes towards disability, and a lack of local opportunities. Zwald (2008) added that, special education teachers must be trained in adapted physical education so that they can effectively engage students with special needs in physical education activities.

Conroy (2012) also conducted a study on supporting students with visual impairments in physical education by physical educators. The purpose of the study was to

explore the experiences of physical education teachers in supporting the curricular needs of students with visual impairments in general physical education classes. With a Twenty-five participants were interviewed concerning how physical education teachers support the curricular needs of students with visual impairments in general physical education classes. One of the findings was that teachers needed training in planning and differentiating the curriculum for students with visual impairments in physical education, as well as training about how students with visual impairment learn. Conroy, further suggested that training in the expanded core curriculum and strategies for including these areas into physical education classes would help physical education teachers better meet the needs of students with visual impairment in a way that could carry over into many other areas making instruction authentic, meaningful and highly motivating.

2.4.4 Lack of adapted physical environment

Environmental barriers are defined as all the obstacles that may hinder the full participation of people in activities in the environment. For instance, Owusu (2009, p. 35) explained environmental barriers as "consisting of "…physical and social elements that create and limit the participation opportunities" .Physical environments are the objects and spaces in which a person interacts while the social environment consists of social groups and occupational forms (Hemmingson & Borell, 2002). Owusu added that children's perception about an environment affects their opportunities in participating in an activity, which in turn affects the situations surrounding their participation. Martin (2013) indicated that, in some previous researches, children often stressed that, lack of a place to play and not having friends to play with were some of the barriers that prevented them from

participating in physical activities. Also, parents of children with visual impairments stated that lack of opportunity was one of the top three barriers to the inclusion of their children in physical activities (Lieberman et al., 2002).Additionally, Agesa (2014) added that restrictions in environment are some of the challenges that children face in inclusive settings.

From a study conducted by Hemmingson and Borell (2002) on environmental barriers in mainstream schools, which involved 34 students with physical disabilities, the researchers found that majority of the students with physical disabilities in mainstream schools experienced barriers to participation in both the physical and the social environment. For the validity of the study 16 experienced occupational therapists, who worked in seven different habilitation centers in Sweden collected the data. Based on the findings of the study, the researchers suggested that, older students with disabilities and students who do not have access to an assistant should be considered first. In other words, for an effective inclusion to happen, environmental surroundings that are vital for students with special needs should be considered. These may include mobility equipment such a white cane for students with visual impairments and wheelchairs for students with physical disabilities (Msuya 2005).

Ammah, Casebolt, Lamaster and O'Sullivan (2004) also conducted a study to find out behaviours and beliefs of secondary general physical education (GPE) teachers in including and teaching students with disabilities. The study concluded that though most teachers had positive beliefs about inclusion, most of them felt inadequately prepared or lacked support and resources to effectively teach students with more severe disabilities.

When inclusion is not well implemented, students may not be given enough support services when it comes to subjects such as physical education, which in turn may not give the teachers the opportunity to make the necessary adaptations, especially to the environments where physical education activities are supposed to take place (Block, 2000). In support of this, Owusu-Amoako (2015) carried out a study on support services and adaptations for pupils with visual impairments in an inclusive school in Ghana. He used a case study design and a questionnaire as the instrument for collecting the data from 14 teachers. One of the findings of the study suggested that, the school's environment did not encourage mobility, neither did the playground allow pupils with visual impairments and the sighted pupils to engage in physical activities together in the school. The researcher therefore suggested that, for increased participation of both students with visual impairments and their sighted peers in school activities in the same environment, the government must help build adaptable environments to enhance learning activities in schools.

Garedew (2011) also conducted a study on the implementation of physical education lesson for students with motor disability in Oromia zone in Addis Ababa, Ethiopia. The study used a qualitative research and a case study design that involved 24 participants (12 students and 8 teachers who were purposively sampled, and 4 principals who were randomly selected). Data collection was done through interview, observation and focus group interview. The results of the study showed that the school's playgrounds, facilities and equipment and physical environments were not appropriate and equitable in teaching physical education to both students with and without disabilities. The researcher recommended that physical education teachers and administrators should seek the most

equitable ways of making knowledge and skills of the discipline of physical education accessible to students with physical disabilities.

2.4.5 Lack of adapted materials

One of the factors affecting the participation of students with disabilities is inadequate materials and equipment (Kentiba, 2013). From the study conducted by Garedew (2011) the researcher observed from 8 schools she visited that there was not enough and appropriate instructional materials, equipment and facilities to teach physical education to both students with and without disabilities. Agesa (2014) pointed out that, students with visual impairments found it very difficult to perceive the qualities of objects when they are not embossed for touch and manipulation. Therefore, by adapting physical education equipment, rules, and roles to students with visual impairments will assist teachers to help students with disabilities to be more experienced (Tedekel, 2010). From an investigation carried out by Kelly, Ajuwon, and Wolffe (2015), it was revealed that, lack of adapted equipment was one of the challenges adults with visual impairments face in participating in recreation and leisure activities., The participants in that study included 172 working adults with visual impairments in Nigeria who responded to an open-ended survey about recreation and leisure activities. Based on their findings, Kelly et al. recommended that working adults with visual impairments should be provided with equipment and materials that could increase their engagements in physical activities. Asempa (2013) also conducted a study on adaptations for enhancing inclusion of pupils with disabilities in selected schools in Ghana. Ninety teachers were randomly selected for the study, and questionnaire was used to collect the data. The findings in that study

indicated that though there were adequate instructional materials in the schools, they were not adapted to meet the needs of students with disabilities. Asempa recommended that teachers should be provided opportunities for in-service training so they can acquire requisite skills in adapting the national curriculum to enable pupils with disabilities to participate effectively in teaching and learning process.

2.5 Strategies for Involving Students with Visual Impairment in Physical Education Activities

Various strategies may be used by teachers to involve students with visual impairments when teaching physical education activities. These activities may include, tactile modeling, physical guidance, physical demonstration with verbal prompts and one-on- one instruction which may be an effective methods that can be used in improving motor skills and physical activities of students with visual impairments (O'Connell, Lieberman, & Peterson, 2006). Wanjiku (2014) defines teaching strategies as the personalized instructional approaches or methodologies that cater for the individual needs of learners with multiple disabilities which may include; support services, structured teaching, functional curriculum, teaching resources and specially trained personnel among others.

2.5.1 Verbal description of instructions

According to Letcher (2016), descriptive verbal instructions may be used when teaching or demonstrating activities to students with visual impairments. Whatever needs to be said for students to understand instruction, must be said the exact way it is being

performed. For example, when teaching how to hop, the teacher may use instructional prompts like, "Stand on your left foot", "raise your right foot" and "jump in the air on your left foot". Letcher (2016) further asserted that, the use of directional words and landmarks such as, "walk to the door, turn toward the window using quarter turn" in the playing area to direct a student with low vision is very necessary when instruction students with visual impairments.

Also, in teaching the students who are visually impaired, charts, diagrams, graphs and other information being presented in a visual format must be explained and described verbally (Miner, Nieman, Swanson, Woods, & Carpenter, 2001). Furthermore, coaches must use concise verbal instructions and descriptions when teaching an activity such as swimming to athletes with visual impairments (Special Olympics Aquatics Coaching Guide, 2004). The environment where the games take place and the equipment to be used may also be described verbally for effective participation. Orienting a student who is visually impaired in a new physical education environment may also need verbal description of the route in order to enable them to gain the initial spatial orientation by building the related cognitive map of the environment (Garaj, Jirawimut, Ptasinski, Cecelia, & Balachandran, 2003). Garaj et al. added that, in a very complex environment, a detailed verbal description cue can be provided to students with visual impairments. This might help the students feel more comfortable when moving in the environment, such as a physical education environment.

A study was conducted by Carpenter and Nangle (2002) on effects of brief verbal instructions on aggression in pre-school pupils. The researchers used 19 pre-school children as the subjects, whom they observed over time during the period of the study. The

findings suggested that, the use of verbal instructions help teachers to minimize aggressive behaviours among pupils in pre-school. The researchers suggested that parents must be involved in any future research in a similar study, so that parents can also observe pupils in the home environment. The differences between the study conducted by Carpenter and Nangle (2002) and the current study was the use of pre-school children as the participants while the current study focused on students in a senior high school. The similarity on the other hand is the use of verbal instruction as a strategy for effective participation of children in classroom activities.

Luo (2000) also noted that, the use of physical and verbal descriptions influences children's abilities to deal with their emotions or those of other people around them. Luo pointed out that the use of "I-messages" such as "I am sorry", "I will assist you" is very important in explaining adults' feelings. Also, descriptive feedback must be used to acknowledge children's behaviour. The author further asserted that, students must be reinforced through praise. When these are done, students are able to express their feelings in words. However, Ponchilli (n.d.), argue that, demonstrations in teaching are better instructional choices than verbal instructions. From an observation by Herold and Dandolo (2009) realized in a gymnastic lesson during a physical education class, that whenever pupils do not fully understand the verbal instructions of the teacher, the learning support assistant verbally provided a more detailed explanation.

2.5.2 Use of demonstrations

Demonstration seems to be the commonest teaching strategies teachers use to involve their students in various physical education activities in the regular classroom. In physical activities, demonstrations are very necessary when working with people with visual impairments (British Blind Sports, 2015). Alberto and Frederick (2000emphasized that students without visual impairments usually learn through visual observation, but for students with visual impairments, instructors must regularly use physical guidance or tactile modeling to convey the correct skills. Physical guidance involves performing a particular movement with an individual to get the feel, rhythm, and motion of the movement being instructed, and it is mostly done with the instructor physically assisting the student. Tactile modeling describes how the student physically explores the movement of the instructor (O 'Connell et el., 2006).

A study by Cieslak (2013) revealed that, out of 13 children with visual impairments 46% of them preferred physical guidance, followed by tactile modeling (30.8%), then both physical guidance and tactile modeling (15.3%); and lastly, verbal explanations (7.7%). From the above, it is very clear that using physical guidance as an instructional strategy led to a quicker learning process. The qualitative approach and phenomenological design were used for the study. The focused group- interview and observation were also used to gather the information from the participants. It was finally recommended that, the best practices that could be used to support students with visual impairments was to improving their level of participation in physical activities.

Again, a study carried out on the effects of trained peer tutors on physical education of children who are visually impaired by Wiskochil et el., (2007) through the use of

demonstration, feedback, physical guidance and tactile modeling as strategies by peer tutors revealed that, out of the four strategies, the use of tactile modeling was the least to be used by the peers. The researchers used experimental design for the study and the participants included four students with visual impairments and two to four same-aged, same-gender peer tutors from their integrated physical education classes. The British Blind Sport (2015), again added that tactile board may also be used to demonstrate activities to athletes with visual impairments.

Further, Obi et al. (2006) conducted a qualitative research on teaching numbers to pupils with intellectual disabilities in two unit schools for students with intellectual disabilities in Ghana. With a population and sample size of 4 teachers of pupils with disabilities, they used observation, interview and document scrutiny as the instruments for data collection. It was revealed that, demonstration was one of the main strategies teachers use to involve pupils with intellectual disabilities in teaching of number concepts to pupils with intellectual disabilities. This implies that, demonstration plays a great role in teaching pupils with disabilities including those with visual impairments because when activities are not demonstrated, pupils may end up not understanding concepts.

Shelton (2013) also tried to find out if demonstration can be used as a strategy to improve understanding of concepts among students with and without disabilities in the mainstream classroom and to improve high school students' abilities to understand concepts in chemistry. The researcher selected 96 students for the study. Pre-test and post-test questions were used to gather the information from the students. The researcher found that, students understood concepts and performed better when teachers used demonstrations in teaching chemistry. The researcher suggested that, though the study was

for only students with disabilities in a chemistry class, demonstration can be used in other subjects to enhance effective teaching and learning. There were few differences between the above study and the current study which include, the geographical location of the schools and subjects in which the study was conducted. The place where the study was conducted was in the United States of America and it was done in a chemistry class, but the current study was conducted in Ghana in physical education environments. Demonstrating an activity for a person with severe visual impairment may be very difficult, but there are ways through which demonstration can be modified to suit their participation; and one of the ways is by demonstrating through modeling (Ponchillia, n.d.). The author further added that,

> The most common tactual means of modeling is by either having the learner follow the instructor's movements or by manipulating him/her. The former type is useful for such shots as comparing a proper and an improper shot putting technique, or for demonstrating the proper body position for the take off in long jumping. In the case of putting, the instructor would demonstrate (model) the movement and have the athlete either get close enough to see it or to tactually "watch" it (p.11).

Skills which are mostly taught in the classrooms can be done through the use of prompts and then by guiding students as they develop independence (Rosenshine, 2012). During an observation in a study conducted by Surakka and Kivela (2008), the authors realized that when instructors were demonstrating hands on activities, the participants who were visually impaired placed their hands on the instructor´s body to feel the movement. This may help students with visual impairments to get the mental picture of how the activities

are being done. Alternatively, O 'Connell et al. (2006) suggested that, if students who are totally blind are not able to use only demonstration or are not able to perform physical activities successfully after enough explanation, tactile cues should be used to ensure success. They further added that physical demonstration techniques must not be used in isolation, but rather with verbal prompts, descriptions, and feedback in a language that students are able to speak and understand.

2.5.3 Use of peer tutors

A peer tutor is a student who helps another student(s) during teaching (Block, 2007). Peer tutoring, which can also be called peer teaching (Rink, 2006) has to do with children learning activities in pairs in the classroom (Igune, 2009). Block added that it is done to reduce the workload and pressure on teachers and for children with special needs and their non-disabled peers to effectively interact in the classroom. Doganay (2007) also sees peer tutoring as a teaching strategy where skillful students teach other students in the same grade level with the guidance of a teacher. According to Nurmi, Hirvensalo and Klemola (2013), peer tutoring helps students to be more responsible, take part actively in tasks, and promote their level of involvement in activities. Loke and Chow (2007) also pointed out that, peer tutoring helps students to be self-confident, responsible and socialize easily.

Wiskochil et al. (2007) conducted a study on the effects of trained peer tutors on academic learning time-physical education of persons with visual impairments. The findings from this study revealed that utilizing trained, same-age peer tutors during physical education is beneficial for students with visual impairments to be included in the

general physical education class. The experimental design was adopted for this study and the participant included four students with visual impairments who were observed from 4 to 6 classes in baseline. The researcher used a modified version of the ALT-PE coding sheet to gather the information for the study.

Again, one of the findings of the study carried out by Mirzeoglu (2013) on the effects of peer teaching on university student's achievement in cognitive, affective, psychomotor domains and games performance in volleyball in Turkey, revealed that students who were taught by their peers performed very well in volleyball skills. The researcher however, used the quasi-experimental design for the study. For the participants, 70 students were used for the study where they were divided into experiment I, experimental II and control group X. It was concluded that instructional models influence the university students' achievement in the different domains in similar ways.

Yet, another study conducted by Klavina and Rodionova (2015) revealed that, social interaction between peer tutors and tutees still remained low after performing in many physical activities. The study explored the effects of instructional accommodation of peer tutoring on interaction behaviours between middle school students with and without severe and multiple disabilities in inclusive physical education. Two students with severe multiple disabilities were purposively selected to participate in the study under two instructional support conditions for students with severe and multiple disabilities (SMD).

Again for peer tutors to have a positive effect on the performance of students with visual impairments in the physical education classroom there may be the need for training and preparing the peer tutor. According to Yang and Rusli (2012), peer training may be necessary for peer intervention when teachers want to use them for teaching. They added

that, in the training peers are taught different strategies that will help their classmates with disabilities increase interactions or responses to questions being asked. The use of trained peer tutors is one of the instructional strategies many teachers use for including students with visual impairments into the regular class room (Zwald, 2008). Fernandez-Vivo and Cordero (2005) stated that peer tutoring increased the level and stability of the motor-appropriate behaviour of students with visual impairments who were integrated into general physical education classroom.

2.6 Resources Available for Supporting Students with Visual Impairments in Physical Education Activities

According to Marshall and Hardman (2000), lack of material and personnel resources is a challenge in physical education as a subject, because it has always been marginalized and undervalued by authorities in many countries. Adeogun and Osifila, (2008) also added that educational resources may include human, material, physical and financial resources. Wanyama (2011) explained that physical education resources include, teachers, classrooms, playing fields, facilities and financial abilities, therefore physical education encompasses everything that is needed to ensure the provision of physical education in schools.

According to a study conducted by Delicata (2011), lack of resources was revealed to be one of the challenges experienced teachers face when teaching physical education to females with disabilities in inclusive settings. Delicate therefore recommended that appropriate training for health and physical educators with regard to how to appropriately instruct those with physical disabilities must be included in teacher education programs.

The United Nations Educational, Scientific and Cultural Organizational (UNESCO, 2005) indicated that a range of resources which include teaching materials, special equipment, additional personnel, new teaching approaches or other learners can provide support when learning a task.

Teketel (2010) studies challenges and opportunities to persons with disabilities in physical education curriculum in higher education institutions and found that, lack of resources was one of the challenges students with disabilities face in physical education curriculum. The study employed a qualitative approach that included 33 physical education teachers in higher institutions, 22 students with disabilities and 5 concerned informants of special needs education students. Questionnaire, semi structured interview, focus group discussions and observation were the instruments used in collecting the data. Teketel concluded that the curriculum must be adapted for students with disabilities in physical education in order to address their needs according to the type and the level of disabilities or impairments. Lieberman (2011) stressed that, mostly there is no separate physical education curriculum for children with visual impairments since adaptive physical education teachers make adaptations based on individual characteristics, whether associated with a variety of co-occurring disabilities or with varying levels of vision loss.

2.6.1. Human resources for teaching physical education

Human resource is about people that operate an organization (Heathfield, 2016), and in physical education, it may include every person who helps in achieving successful physical education activities for children. The human resource list may include physical education teachers, coaches, trainee/coach, player/coach, grounds-men, volunteers, store

keepers, and facility managers (Aluko, 2011). The author further added that, all these people help in facilitating successful sport. On this note, Aluko conducted a survey study on the status of school physical education in public primary schools in Edo State. The author intended to develop a benchmark for describing the programme of physical education in public primary schools in Edo State, Nigeria, based on the findings. In all, 486 primary schools were sampled with a checklist to gather the information on the part of the sports personnel. The author found that only National Certificate of Education (NCE) and Ordinary National Diploma (OND) holders had the highest status, which further indicated that, there was lack of personnel resources in teaching and managing sports in the schools.

Lieberman (2011) also pointed out that, for an appropriate inclusion of students with visual impairments in physical education, there is the need for multi-disciplinary team members who can work hand in hand for a successful physical education, such as parents, resource specialist in adapted physical education, the vision teacher, and an orientation and mobility instructor. According to Zwald (2008) orientation and mobility specialists are:

> Professionals who graduated from a university with an accredited Bachelor/Masters degree program in orientation and mobility. These specialists teach skills necessary for safe and independent travel in a variety of environments using a cane or other assistive devices according to the individual needs of the student (p. 21).

Additionally, an orientation and mobility instructor is one of the multidisciplinary team members who help in developing and implementing individualized education programmes for children with visual impairments (Hill, 2016).

Winnick (2011) identified other critical school and non-school staff, including school nurse, adapted physical education teacher, regular physical education teacher, physicians, coaches and related service personnel as some of the human resources needed in engaging students with visual impairments in physical education. Bevans, Fitzpatrick, Sanchez, Riley, and Forrest (2010) conducted a study on physical education resources, class management, and student physical activity levels in Maryland and West Virginia. The findings of the study suggested that the availability of a greater number of physical educators per student influence students' activity levels by reducing the amount of session time devoted to class management. The authors therefore suggested that, school districts must allocate adequate resources to recruit and retain highly skilled physical educators to permit longer physical education class sessions and maximize student physical activity during physical education.

2.6.2 Material resources for teaching physical education

Material resources are physical and concrete means that help in achieving a goal (Didactic Encyclopedia, 2015). According to Send All My Friends to School (2014), for effective inclusion teachers to have knowledge in child-centered teaching methods, there should be learning materials that can easily be accessible, and the school environments should provide children with disabilities the opportunity to fully participate in their learning. However, many studies have established that physical and material resources in secondary schools are inadequate all over the world (Wanjiku, 2013). Niwagaba (2014)

stressed that, it has been agreed universally that special material resources are very necessary for the success of students with visual impairments in regular schools.

Materials resources for including people with visual impairments in physical education may include jingle balls, sound balls, tactile materials, and lager and brighter materials (British Blind Sport, 2016). The findings from a study conducted by Tadese (2012) showed that, there were limited materials resources that students could use when participating in physical education, and there were also not enough opportunities for students to participate in specific sports. The researcher therefore recommended that, the physical education environment and facilities should be conducive and easily accessible to female students.

2.7 Summary of literature review

Chapter two reviewed related literature on participation of students with visual impairments in physical education activities. The literature highlighted the extent to which students with visual impairments participate in the various physical education activities such as gymnastics, ball games, athletics and physical fitness. The literature also revealed the various adaptations made to physical education activities to fully involve students with visual impairments in the various physical education activities. These adaptations included the adaptations made to the instructions, instructional material environment and rules.

Strategies teachers use to involve students with visual impairments in physical education activities were another aspect which were highlighted in the literature. The strategies included verbal description of instructions, use of demonstrations and use of peer tutors. The literature revealed the challenges students with visual impairments face when involved in the various physical education activities in the regular classroom. Poor motor

skill development, lack of confidence, lack of trained tutors, lack of adapted environment and lack of adapted materials were some of the challenges revealed in the literature as students with visual impairments face when participating in physical education activities in the regular classroom. The literature finally revealed the resources available for including students with visual impairments in physical education activities. Two resources were highlighted in the literature; namely, human resources and material resources. The literature however, did not specifically highlight the participation of students with visual impairments in physical education activities in Senior High Schools in Ghana, specifically Wenchi Methodist Senior High School. This study was therefore set out to address the gap.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the methodology for the study. The following areas were covered: research approach, research design, population, sample size, sampling technique, instrumentation, validity, reliability, procedure for data collection, data analysis and ethical considerations.

3.1 Research Approach

The mixed method approach was adopted for the study. Creswell and Plano (2011) noted that, mixed method approach involves collecting data using both quantitative and qualitative methods in a single or many studies for the purpose of understanding the phenomenon of interest. Mixed method approach is not required to choose between qualitative or quantitative methods but rather, to determine how both qualitative and quantitative methods would answer one's research questions (Graff, 2016). Creswell (2003) also stressed that, data collection in mixed method approach involves gathering both numeric data and qualitative data so that the final database would represents both qualitative and quantitative information. The mixed method approach was used for this study because, the researcher wanted to obtain data on the targeted sample for the study. This was intended to further help the researcher to compare the participants' responses to check if the respondents had similar or different answers to the research questions.

Plastow (2016) citing Creswell (2013) identified three different types of mixed-methods studies, which include concurrent (convergent), explanatory sequential and exploratory sequential. This study focused on the concurrent type of mixed method approach.

In concurrent mixed method, the researcher converges both qualitative and quantitative data in order to provide a comprehensive analysis of the research problem (Creswell, 2009). Plastow (2016) added that concurrent research involves a single data collection episode in which various qualitative and quantitative strategies are used to answer a research question. According to Creswell, Tashakkori, Jensen, and Shapley (2003) concurrent research is used to confirm, cross-validate or corroborate findings within a single study. Concurrent mixed method collection strategies is employed to validate one form of data with the other form, to transform the data for comparison, or to address different types of questions (Creswell & Plano 2011).The researcher used this type of mixed method because, it allowed her to collect both the qualitative and quantitative data at the same time during the study and compared the data during the interpretation of the result to check if the two results were the same or similar (Creswell, 2014). Furthermore, this design helped the researcher to ascertain information from the participants on the participation of students with visual impairments in physical education activities.

3. 2 Research Design

The descriptive survey research design was adopted for the study. This design involves describing how things really happen in their natural phenomena (Jong & van der Voordt, 2002). Descriptive survey does not fit neatly into the definition of either qualitative

or quantitative research approach, but instead it can utilize elements of both approaches which are usually within the same study (Association for Educational Communications & Technology, 2001). According to Creswell (2008) descriptive survey is mostly used to compare variables, and may be directed more toward learning about a targeted population. Danso (2009) also stated that a descriptive survey provides a more accurate and meaningful picture of events or seeks to explain people's perception and behaviour on basis of what data is gathered at a particular time. This design was adopted for the study because it is a single design that employs both the qualitative and quantitative approaches, which further allowed the researcher to compare responses concerning the purpose of the study.

3.3 Population

The population for this study included all students with visual impairments and all teachers teaching physical education as a course in Wenchi Methodist Senior High School in the Brong Ahafo Region of Ghana. The total population was 65 respondents, which comprised 60 students with visual impairments and 5 tutors teaching physical education in the school. Table 1 shows the population distribution for the study.

Table 1. Population distribution of respondents

Participants	**No.**
Physical education tutors	5
Students with visual impairments	60
Total	**65**

Source: (Field data, 2016)

3.4 Sample Size

The sample for the study was made up of 62 respondents in the school. These comprised all the 60 students with visual impairments and 2 tutors teaching physical education as a course in the school. All the students were involved because the population of the students with visual impairments was small and could give concrete information about their participation in physical education activities in the school. Two tutors who were teaching physical education were involved because of their roles and experiences in teaching physical education in the school. Table 2 shows the sample size distribution of respondents.

Table 2. Distribution of Sample Size of Respondents

Participants	**No.**
Physical education tutors	2
Students with visual impairments	60
Total	**62**

Source: (Field data, 2016)

3.5 Sampling Technique

Sampling technique refers to the process of selecting a portion of the population to represent the entire population (Fraenkel & Wallen, 2000; Muijs, 2004). The purpose of sampling is to obtain a group of participants who will be representative of the larger population or will provide specific information needed to address the questions raised (Hayford, 2013). Purposive and census sampling were used for selecting the respondents for the study. The tutors were purposively selected whilst the students were sampled using

the census approach. Cohen, Manion and Morrison (2007) also noted that, in purposive sampling, the researcher handpicks the cases to be included in the sample on the basis of his or her judgment. The purposive sampling technique was used to select the tutors because the tutors those the school personnel responsible for teaching physical education, and who had been teaching the subject in the school for over two years now. Therefore those two teachers were well experienced and could provide key information about the research questions.

The census approach was used to select the students with visual impairments. A census study, according to Creswell (2012), permits conclusions to be drawn about the entire population. The census approach was used as the sample size selection for the students because the number was small and it simply report descriptive statistics about the entire population (Creswell, 2012). Also, Krejcie and Morgan (1970), cited in Cohen et el. (2007) stated that where the population of the study is small as in less than 100, it is advisable to include the whole wider population as the sample. Furthermore, the use of this technique helped the researcher to get more information from all the participants concerning the research topic.

3.6 Instrumentation

The instruments used for collecting the data for the study were semi-structured interview guide and close ended questionnaire.

3.6.1 Semi-structured interview guide

A semi-structured interview guide was used for collecting the data for the study. The interview questions were prepared based on the key themes raised in the questions. According to Avoke (2005) interviews can be described as a form of conversation between two people. Semi-structured interview guide was used because it allowed for deeper probing of issues from respondents on the research questions.

3.6.2 Questionnaire

A close-ended questionnaire in the form of a Likert scale type was used to collect the data from the students; and the items were built on a five-point scale ranging from strongly agree (SA) = 5, Agree (A) = 4, Neutral (N) = 3, Strongly Disagree (SD) = 2 and Disagree (D) = 1. This type of data gathering was appropriate for the study because it was in line with the assertion of Robson (2003) who stated that a Likert scale type makes respondents enjoy responding to questions posed by the researcher, since in many cases, respondents respond to opinions demanded by the researcher. Again, the Likert scale is very easy to analyze statistically (Jackson, 2009) and brings out the information needed on the research topic. However, it has a disadvantage of respondents not being allowed to express their own personal view.

3.7 Validity

First of all, a written format of the interview guide for the interview was shown to the researcher's supervisors for approval. To ensure trustworthiness, responses for the interview were played to respondents to listen immediately after the interviews were

conducted to make sure what were recorded were really respondents' views. The transcribed interviews were also shown to the respondents again to check if what were said were what had been transcribed. The content validity was then adopted where the interview guide and questionnaire items were carefully designed to cover the key themes raised in the research questions.

3.8 Reliability

To ensure reliability of the interview guide, it was given out to colleagues for peer review and expect opinion from the research supervisors. On the other hand, a pre-test was conducted with a sample of 10 students with visual impairments from the University of Education, Winneba who completed Wenchi Methodist Senior High School a year earlier. A questionnaire was used to collect data, which was used for the reliability test. Cronbach's alpha value was calculated. Table 3 shows the results of the reliability test for the various sections of the questionnaire.

Table 3: Reliability Scores of the Pre-test

Factor	Cronbach's Alpha	No. of items
Involvement in physical education activities.	0.584	10
Adaptations to physical education activities.	0.614	13
Challenges in participation in physical education activities.	0.759	14
Strategies used to involve students in physical education activities.	0.589	8
Resources available for teaching physical education.	0.202	7
Total	**0.745**	**52**

Source: (Field data, 2016)

From Table 3, the reliability of the questionnaire items was computed to be 0.74. According to Zaiontz (2016) the acceptable variables for alpha, range from 0.70 to 0.95. Therefore the Cronbach's Alpha value was reliable and can be used for gathering the data. The interview which was also conducted on the result from the pre-test revealed that, some of the questions were not well-structured and asked, and therefore needed corrections. This was in line with Alumode (2011), who stated that the main reason for pre-test is to detect ambiguities, deficiencies and weaknesses in the instrument for correction and modification so as to improve the internal consistency of the instrument.

3.9 Pre-testing

The questionnaire was pre-tested on 10 students with visual impairments in University of Education, Winneba, who completed Wenchi Methodist Senior High School a year earlier. The purpose of the pre-test was to establish the validity and reliability of the questionnaire by checking for clarity of items, instructions and layout, as well as to gain feedback on the questionnaire (Cohen et al., 2007). The pre-test was conducted to determine whether the questionnaire would be understood by the sample to be surveyed. Results from the pre-test informed the researcher on whether the participants understood the questions in the instrument. This offered the researcher an opportunity to modify the questionnaire. This resulted in altering some of the items which needed further clarification, to fine-tune the questionnaire for the main study.

3.10 Procedure for Data Collection

Before the researcher went out to collect the data for the study, she took an introductory letter from the Head of Department of Special Education, University of Education, Winneba, which was shown personally to the headmaster of Wenchi Methodist Senior High School to seek permission to collect data from tutors and students. After the headmaster had agreed and informed the tutors about the intentions to involve the tutors and the students, the researcher met with the tutors in their classrooms and explained the purpose of the study were made known to them. They were all assured of the necessary confidentiality plans concerning the data to be collected. The day and time of the data collection was agreed upon with the tutors and the students. When the time was due, the researcher went back as agreed on and collected the data.

3.10.1 Interview

The semi-structured interview guide was used to collect data for the study. The teachers were interviewed on one-on-one basis. The one-on-one interview approach was used for the teachers because they were all willing to share their views about participation of students with visual impairments in physical education activities. Creswell (2005) supported this when he noted that, one–on-one interview is ideal for interviewing participants who are willing to speak, articulate and who can share ideas comfortably.

Again, since only two physical education tutors were involved, the researcher found it appropriate to interview them one-on-one so that she could get more accurate answers to her research questions. The interview, which was done face-to-face, took place in the information and communication technology (ICT) laboratory and lasted between 35

minutes to 40 minutes. The respondents were interviewed each at a time in order to elicit correct responses. Responses from the participants were recorded on a tape recorder for easy transcription. The interview questions were asked from an interview guide but the researcher asked other related questions which were not on the interview guide.

3.10.2 Questionnaire

The questionnaire were personally administered to the 60 students selected for the study and they were given two days to finish answering the questionnaire. Prior to giving out the questionnaires, the researcher adequately explained how the student participants were to answer the questionnaire.

3.11 Data Analysis

The analysis of the data was done by analyzing the interview, followed by the analyses of the questionnaire.

3.11.1 Analysis of interview data

The interview data were transcribed based on the code for each interview. The thematic contents were formulated based on the research questions and the data gathered were grouped together and analyzed under each thematic content, and then discussed with the findings of other related studies. Participants' verbatim responses were also used where necessary.

3.11.2 Analysis of questionnaire data

With the help of the Statistical Package for Social Sciences version 21.0 (IBM SPSS, 21.0), descriptive statistics were calculated to obtain the frequency and percentages for each item-by-item analysis which was used to simplify the data. Also, the independent samples t-test was used to test the hypothesis for statistical significance. The researcher used the SPSS software for the data analysis because it was reasonably user friendly. For the purpose of the data analysis and discussions, the responses at the extremities such as "Strongly Agree" and "Agree" on the Likert-scale were combined as one and those for "Strongly Disagree" and "Disagree" were also combined as one. This was done to simplify the data for easier analysis and discussion.

3.12 Ethical Consideration

Ethical matters are very important in research and therefore have to be a concern to the researcher. The students and tutors who took part in this study were personally informed about the purpose and the procedure involved in gathering the data for the study by the researcher before the study was conducted. The participants were not forced to take part in the study, but rather it was done on a voluntary basis. The participants were assured of confidentiality of any information they would give. The researcher also assured the participants that information they gave was going to be treated confidentially; and they were also told that they could withdraw from the study anytime they wanted. Again permission was sought from the participants to tape record the interviews.

CHAPTER FOUR

ANALYSIS OF FINDINGS

4.0 Introduction

This chapter presents the results of the findings. The chapter is divided into two sections: the first section presents the transcriptions of data generated from the interview conducted with the teachers and the second section analyzes data from the students through a questionnaire. The analysis reflected on the themes that emerged from the data.

4.1 Analyses of Qualitative Interview Data

This section presents analyses of the one-on-one interview data which was done with the teachers. The interview data were coded and subjected to thematic analyses and consequently, the themes and sub-themes have been used in the analysis of the main variables of the research questions. To answer the first research questions, the responses from the interview data were used.

4.1.1 Research Question 1: To what extent do students with visual impairments participate in physical education activities?

Four themes emerged from the analysis of this variable. These included the extent to which students with visual impairments participate in gymnastics, ball games, athletics and physical fitness activities. The respondents who were the teachers were interviewed one- on- one at different times. Each teacher was asked to describe the extent to which students with visual impairments participated in physical education activities and from

their responses it was noted that the students with visual impairments were involved in some of the physical education activities. For example,

Teacher A commented:

> *I involve students with visual impairments in so many activities such as soccer and goalball which we add the sighted students, volleyball, handball, basketball and also athletics events* (A verbatim expression by one teacher).

The same teacher added:

> *For the track events they participate in 100 metres dash and for the field, the standing broad jump*. (A verbatim expression by the same teacher).

Teacher B also said:

> *Physical education is a general subject for all students in the institution so that whatever activity that we get ourselves involved in we try to engage those with visual impairments too but the engagement is normally based on their abilities because there are certain activities that they can't participate in so much especially when it involves manipulative activities. However for activities such as football, volleyball, basketball, aerobics dance, long jump, 100 metres and activities that involve rolling, we try to adapt it to include them.* (A verbatim expression by another teacher).

From the analysis of the interview four sub elements emerged. These included, the extent to which students with visual impairments are involved in gymnastics (rolling), game balls, athletics and physical fitness activities (aerobics).

Participation of students in gymnastics

From the analysis of the data, it was realized that one of the main themes under the extent to which students with visual impairments participated in physical education activities was gymnastics. For instance, a teacher commented this way:

> *We include them in gymnastics. The only problem is that with gymnastics it is very difficult to deal with the hard ground. You need mattress at least to soften the body content. But because all these things are not available certain times we don't include hard activities that involves body contact but body in suspended form can be done, they can hang on bars as they swing, we only have to tell them that they should hold it firm so that they don't go off from the bars***.** (A verbatim expression teacher A).

Teacher B commented:

> *There are certain gymnastics activities they can get involved. For example handstand. Or you will use wall and use handstand with legs up against the wall right? Then they can roll, roll forward and backward roll. These are movements that are quite easy.* (A verbatim expression by another teacher).

From the above comments it was clear that, though students with visual impairments did not participate in intensive gymnastics, they participated in the adaptable ones such as rolling, hanging on bars and handstand. It was again noted from the comment that some of the resources for including students with visual impairments in gymnastics in the schools were not available which further limited them in the kind of gymnastic activities to participate in.

Participation of students in ball games

Another theme that emerged regarding the extent to which students participated in physical education activities was their participation in ball games.

Teacher A said:

> *As for the ball games we always involve them in the goalball and football. For the goalball you know it is pertaining to only the visually impaired students. But what we do is we normally involve the sighted colleague's not to guide them but to also have the feel of the game.* (A verbatim response by one teacher).

Teacher B remarked:

> *We have a lot of games which involve balls that we involve students with visual impairments, we have….erm handball, football, goalball and basketball. But we don't involve them in table tennis and volleyball because it is highly difficult to involve them in. It needs the sight to play and serve.* (A verbatim expression by another teacher).

It was evident from the analysis that students with visual impairments participated in some ballgames but were excluded from others which involve the intensive use of sight.

Participation of students in athletics

Another sub-theme which emerged from the analysis was the participation of the students in athletic events.

Teacher A noted:

> *They participate in field events like the standing broad jump and then long jump. For the standing broad jump, we normally ask them to come and stand on a broad board over there and then they will listen to a whistle and immediately it goes they will jump from the spot and then we will go there and measure the exact distance.* (A verbatim response by one teacher).

Similarly teacher B also added:

> *We introduce what we call broad jump. Stand at a spot, swing your arms enough and take off both legs at the same time then you land in the front and then you will measure the distance. For the field event too we involve them in the shot put, because for that one… we don't need …. You only need to know the direction and the skill to deliver.* (A verbatim expression by another teacher).

Teacher B again stressed that:

> *But when it comes to sprint…. for those with total blindness, we create an environment that is conducive. Normally from 50 metres to 100 metres dash and we make sure the environment is safe, then we use a bell, some lead running and with the ringing of the bell they can follow the direction.* (A verbatim expression by the same teacher).

Teacher A also added:

> *What we do is we normally use the 100 metre dash. For the 100 metre dash, they will be on their lanes, and normally we use ropes so that it will demarcate their various lanes of which they will run through. So while they are running we have people who will be clapping at the end line so that they will know where to stop.* (A verbatim expression by one of the teachers).

The comments from the teachers indicated that students with visual impairments participated in some track and field events. Though they did not participate in the kinds of athletics sighted students participated in, they had specialized athletics such as the 50 metre to 100 metre dash, the standing broad jump and shot put that students with visual impairments took part in.

Participation of students in physical fitness activities

Another sub-theme that emerged from the analysis was participation of students with visual impairments in physical fitness activities. It was revealed that students with visual impairments participated in a lot of physical fitness activities

Teacher A stressed:

> *We have so many physical fitness activities which students with visual impairments are involved in, for instance during aerobic dance because it forms a rhythmic pattern they normally follow music whiles it flows. Again, we also do the sit and reach the toes activity and also they have the jogging aspect the scoring rams we have a target or a cone there and they run to that end and come back.* (A verbatim expression by one of the teachers).

Teacher B also added:

> *Physical fitness activities are more or less, jogging, exercising the body, aerobic dance which we do on the field with both the sighted and the blind. We involve… and the most interesting thing is because they belong to the various classes, they have friends who are sighted so when we are jogging, they hold their hands and jog together. In fact these activities help the students to gain more confidence and learn to move freely without much help from people.* (A verbatim expression by another teacher).

It was obvious from the analysis of responses of the teachers that physical fitness activities were activities in which almost all the students greatly participate. These physical activities included aerobic dance, sit and reach the toes and jogging. It could clearly be noted here that both students with visual impairments and those without visual impairments were involved together without much adaptations.

4.1. 2. Research Question 2: What adaptations do teachers make to physical education activities to suit the needs of students with visual impairments?

According to the respondents, some of the adaptations made for effective participation of students with visual impairments in the various physical education activities included, adaptations made to the instructions, instructional materials, the physical environment and the rules governing the activities. In describing some of the adaptations the teachers make to the physical education activities, Teacher A noted:

> *One of the problem we face here is the playground for the activities, but we try all that we can to put certain things in place to make it suitable for them. Also during competitive activities we reduce the number of players on the field and the time is also reduced. So… yes, those are some of the adaptions we make during physical education activities.* (A verbatim expression by one of the teachers).

Teacher B remarked:

> *You know, blind students can never participate effectively without any adaptation. First of all most of the balls they use have bells in them, again we give them vivid description of every activity*. (A verbatim expression by one of the teachers).

The above analysis shows the various adaptations that were made to the various physical education activities to successfully include students with visual impairments. These adaptations included reduction of number of players, reduction in time of play, the use of bells in balls and vivid description of activities.

Adaptations made to instructions

According to the respondents, they make various adaptations to instructions during physical education activities. For example, teacher A remarked that:

> *I mostly break my instructions into simple units for better understanding and building the confidence level of the students. What I do when I am teaching something like football is, before we start I*

> *have to introduce the lesson to everyone, and tell them how the various skills are done. I have to do it bit-by-bit from the bitten aspect I have to first of all execute it for the sighted colleagues to assist those with visual impairments, through my instructions so when I instruct them we are going to start with throwing for throwing, you have to take the ball. I will ask them to feel the ball and some students will fear to take the ball so as they feel, it will just take away their fear. They will then lift the ball up and throw from behind their shoulder as instructed (*A verbatim expression by a teacher)

Teacher B also added:

> *In the process of carrying out an activity that you will like to use the sighted ones, you would have to need some adaptations of the instructions so that it will help them to either locate or to be able to perform an activity. I tell the students exactly what we are doing so that they can also have the mental picture of the activity.* (A verbatim response by one of the teachers).

Teachers' views were also sought on the satisfaction of the students on instructional adaptations in physical education activities and these were some of their responses,

> *So, at times some of the students come to you and say that ohh… today dier…, the lesson we were very happy.* (A verbatim expression by teacher A)

Teacher B also added:

> *On the issue of they being satisfied or not, after the instructions, it depends on the interest of the students. Sometimes when the students already have interest in the activities it does not take a long time for them to get the instructions given, therefore they become very satisfied and happy. Again sometimes the students doesn't need to tell you if they are satisfied or not, as a teacher sometimes you will see it yourself.* (A verbatim expression by another teacher).

The comments above show that when instructions are well adapted, activities become very interesting which arouse the inner interest of the students. Some of the adaptations teachers make to the instructions is breaking down of task into it simplest unit for students to follow

and telling students exactly what do during lessons. Another sub-theme was adaptations made to instructional materials.

Adaptations made to instructional materials

As one of the adaptation made to physical education activities for students with visual impairments, instructional material adaptations also emerged as one of the sub-themes. For instance teacher A opined:

> *We have some materials that we use during instructional lesson, so we have the goalball, the futsalball, we also have the medicine ball the small one and we also have football. The goalball and the futsal ball are specialized balls for the blind. They have bells in them that allow them to know and trace the ball where ever it goes. But sometimes when we need more balls we use the normal football. We put it in a rubber bag that makes noise for them to trace.* (A verbatim expression by one of the teachers).

Teacher B also added:

> *You use the instructional material and produce sound out of it. The use of whistle is also very important. For those with low vision we use bright coloured balls except the goalball that has brown colour.* (A verbatim expression by a teachers)

Teacher B again commented on the adaptations made to goalpost as an instructional material in this way:

> *However, there are few problems with the goalpost in that we try to get a flexible and normally we use the pipe holes so that in case they get into contact they will not hurt themselves.* (A verbatim response by the same teachers).

It can be deduced from the teachers' comments that, few adaptions were made to some of the materials used to involve students with visual impairments in physical education activities. For example the use of noisy rubber bag around the ball to produce sound, use

of bells in balls, the use of bright colours on the balls and use of pipe holes as goalposts to prevents students from getting hurt.

Adaptations made to physical environment

Adaptations made to the physical environment were another sub-theme that arose from the interaction with the teachers. Through the interactions it was realized that though there were few challenges in adapting the environment, the teachers tried their best to make the environment suitable for students with visual impairments to also participate effectively in the various physical education activities. These can be deduced from this comment made by Teacher B

> *Certain times also the environment itself doesn't benefit us. For games like goalball, for example, nothing is done to the playground, no carpet on the ground to prevent them from getting hurt so it is not suitable for the game. But for other game balls, we try to locate the specific area that is devoid of all these things that will hurt them, stones, sticks and all that so that their movement is smooth so that they will not run into anything.* (A verbatim expression by one of the teachers)

From the comment above, it was clear that, during games the environment was not adapted to suit the students. For example, no carpet was laid on the playground to prevent the students from getting hurt. However, when it came to the use of ropes to demarcate the lanes or create boundaries, there was a contradiction. For example Teacher A said

> *The running event especially the sprint when they are doing the 100meters dash. We normally use ropes for the various track event. Let say 6 tracks we have about 8 ropes so that you don't fall or move to anybody's track. Sometimes they also trail the rope to the finishing line independently without any ones help. Sometimes also I allow the students to form their own boundaries. But mostly I use the rope. If the ropes are not around what I do is that I ask the students to form boundaries.* (A verbatim expression by a teacher)

But Teacher B said:

> *Though ropes can be used to demarcate the lanes around the boundary, I don't normally use ropes, because the rope itself is also another dangerous thing that can hurt them. But what I normally do is that at the various corners of the field, we have other students with whistles who blow the whistle and the moment the students hear the whistle they realize that they are going out of bounds or when they are getting closer the whistle is blown and that will draw their attention. But all these environment is very difficult to create a very suitable environment for the students.* (A verbatim response by another teacher).

From these comments it was realized that the two teachers were all saying two different things. One said he used ropes to demarcate the lanes to prevent the students from getting hurt and even uses the ropes as trails to the finishing line but the second teacher also said he does not use ropes because the use of ropes itself could be dangerous to the students when they bump into them.

Adaptation made to rules

Adaptations made to the rule also emerged as one of the sub-theme.

Teacher A noted:

> *Mostly in competitive football games we reduce the number of players to five players in each team instead of eleven in each team. But during P.E lessons we mostly concentrate on the skills so rules are not really….. how do I say it…. not really used but sometimes I make the rules very flexible, so that both the blind students and the sighted students will benefit. If this is done the students feel part of the activities.* (A verbatim response by one of the teachers).

Teacher B added:

> *The rules, generally we don't adapt them in the first place, normally we don't have standard rules that we need to follow during physical education. But during competitive games such as football we reduce*

> *the number of players to 5 students in each team, so that they can also enjoy the games.* (A verbatim expression by another teacher).

Comments from the teachers indicated that some rules were only used during competitive games, but when it comes to physical education as a lesson, rules were not adapted because concentration was mostly on the various skills. However, one of the teachers stressed that sometimes he made the rules flexible during physical education lessons so that students with visual impairments would not feel left out.

4.1.3 Research Question 3: What challenges do students with visual impairments face in participating in physical education activities?

The teachers indicated that students with visual impairments faced the following challenges during physical education activities:

Teacher B stated:

> *The challenges are numerous in the sense that when you are dealing with two different people you have to make sure you make the activities suit everyone, in terms of the environment, the materials you will use and many others. But sometimes during physical education lesson due to lack of certain materials for adapting some of the activities for the blind we end up concentrating on only the sighted students, which pose a challenge to students with visual impairments because they are mostly ignored.* (A verbatim expression by a teacher).

From the comment of teacher B it was very clear that, students with visual impairments faced many challenges including lack of materials for adapting some of the activities to suit students with visual impairments. This leaves the teachers with no other option than to concentrate on only the sighted students.

Poor motor skill development

During the interview poor motor development of students with visual impairments emerged as a sub-theme.

Teacher A commented:

> *Generally motor skills developments such balance, running and jumping is a challenge to all students but a little bit more difficult for the visually impaired students because those with the sight can see and that is one advantage but those without the sight will need a lot more effort to bring them up in the skill.* (A verbatim expression by one of the teachers).

Teacher B also added:

> *We can never compare the motor development of students with visual impairments to that of the sighted students. Normally when it comes to motor development the sighted are more developed than the blind because of their ability to see and imitate.* (A verbatim response by another teacher).

It was clear from the views of the teachers that, motor development indeed was a challenge to students with visual impairments in physical education activities. Because most of the students found it difficult to jump, run and have a stable balance.

Lack of confidence

Another sub-theme that emerged from the interview was lack of confidence as one of the challenges students with visual impairments face when participating in physical education activities. For example teacher A said:

> *Some of them may feel they may hurt him or her, especially when playing with sighted students so the first instant they withdraw. But I always tell them or instruct them to have a feel of the ball so that they don't fear the ball.* (A verbatim expression by a teacher).

Teacher B also added:

> *When students are participating in the beginning of an activity for the first time they have very low confidence because they feel their sighted friends may laugh at them but by the time they finish with the activities their confidence level rise a little and occasionally some of them gain very high confidence.* (A verbatim expression by another teacher).

The above comments show that students with visual impairments level of confidence becomes high after they took part in an activity for a long time.

Lack of trained tutors

Lack of trained tutors for the participation of students with visual impairments in physical education activities was also in the analysis:

Teacher A said:

> *There are about five P.E teachers in this school. But only one of them has been trained in special education and physical education which is me. Though I did not do any course in adapted physical education, I take care of the students with visual impairments during physical education lessons. Because of this, students are not getting most of the concepts and they rather end up losing because they are far more than the teacher.* (A verbatim expression by one teacher).

Teacher A again added that:

> *The trained teachers teaching physical education to the blind are very few. Therefore the students are not given the effective instructions as they are supposed to. But I think there should be more physical education teachers who are trained in adapted physical education so that the students will not be affected.* (A verbatim expression by another teacher).

From the above comments made by the teachers, it became clear that, though there were about five physical education tutors in the school, only one of them had been trained in

dealing with students with visual impairments. However, he was also not trained in any adapted physical education, which was a big challenge, because the students ended up not benefiting since they are limited in participating in physical education activities.

Lack of adapted physical environment

With regard to lack of adapted physical environment as a challenge to students with visual impairments when included in physical education activities,

Teacher A stated:

> *When it come to the environment the students face many challenges. For instance the court on which they play the goal ball is full of potholes and also the football field is not levelled and it's also full of potholes.* (A verbatim expression by a teacher).

Teacher B also stated that:

> *However, due to lack of materials for adapting the physical environment we sometimes are not able to involve the blind and sighted together. Which pose a challenge to the blind because when it happens that way we involve only the sighted students.* (A verbatim expression by another teacher).

Comments from the teachers revealed that physical environment where both students with visual impairments and the sighted are involved in physical education is a challenge to those with visual impairments because the environment is mostly not suitable to them.

Lack of adapted instructional materials

Regarding the lack of adapted instructional materials as a challenge faced by students with visual impairments. Teacher A said:

> *For goal posts for example, we were supposed to have bell hanged around behind the poles that is the net so that when the bells ring or when the ball hit the net it will ring for them to hear that there is a goal but here we don't have those materials. We also don't have enough balls specially designed for the blind.* (A verbatim expression by a teacher).

Teacher B also added:

> *The school hasn't got adapted equipment to specifically deal with student with visual impairments. Though there are a lot of materials here, most of them can only be used by the sighted students, because we can't adapt them to for the blind.* (A verbatim expression by another teacher).

Teachers' views on the lack of adapted instructional materials shows that most of the materials available were for only the sighted students therefore preventing students with visual impairments from participating in many of the physical education activities.

4.1.4 Research Question 4: What strategies do teachers use to involve students with visual impairments in physical education activities?

The analysis of the data shows that teachers used many strategies to involve students with visual impairments during physical education activities and have been analysed below.

Teacher A state that:

> *I describe the activities vividly for students to understand* (A verbatim expression by a teacher).

Teacher B added:

> *After explaining each activity, I mostly ask the students who understands the topic well to explain it further to the class.* (A verbatim expression by another teacher).

It can be deduced from the above statements that, teachers use strategies such as vivid description of instructions and students' peers to explain topics into detailed. However more questions were asked on the following strategies:

Verbal descriptions of instructions

On the issue of verbal descriptions of instructions as a strategy,

Teacher A said:

> *Since they are visually impaired I have to verbally describe every single thing I do to them because sometimes if you don't describe some of the instructions to them they will not know. For example In games like football, when we talk of the kicking I always tell them that when you want to kick the ball you have to get closer to the ball, know where the ball is, touch the ball first, after touching it, put your foot that you are going to use to kick the ball behind the middle or around the circumference of the ball, swing the leg you are going to use to kick from behind and kick the ball.* (A verbatim response by a teacher).

Teacher B also added:

> *So for me all my instructions are very direct, brief and vivid.* (A verbatim expression by the second teacher).

From the above comments, it was clear that teachers use verbal description such, direct, brief and vivid instructions as a strategy to include students with visual impairments in physical education lessons.

Use of demonstrations

Another strategy used by teachers to include students with visual impairments in physical education activities is demonstrations. For example teacher A commented that;

> *As for the blind students, I will stand closer or behind the student with the help of other sighted colleagues so that we can go through all the step before kicking the ball. First of all I will hold the leg and demonstrate it and tell them that this is how we are going to kick the ball*. (A verbatim expression by a teacher).

Teacher B also added that:

> *Demonstrations are there and we use them to improve on understanding by students. But demonstrations are done by seeing it but with the case of students with visual impairments, we hold them and give them directions of how their body movement should be done then we allow them to do several attempt.* (A verbatim expression by another teacher).

From the analysis of the viewpoints of the teachers it was very clear that teachers used demonstration as a strategy to include students with visual impairments in physical education activities. The demonstration according to one of the teachers is used to improve on understanding among students.

Teachers view were also sought on the type of demonstration students with visual impairments preferred, whether physical guidance or tactile modelling and below were their verbatim expression,

Teacher A noted:

> *For me I will say the students prefer both the one you hold the students and perform the activity with him or her and the one you will show her the activity before he or she perform the activity on his or her own. This is because sometimes, you need to use the two for better understanding.* (A verbatim expression by one of the teachers).

Teacher B also added:

> *I think the students prefer the physical guidance to the tactile one. This is because I think they find it easier, yeah.* (A verbatim expression by another teacher).

It could be noted that the teachers had different thought about students with visual impairments preference. One of the teachers stated that the students preferred both techniques; physical guidance and tactile modelling while the other teachers also stated that students with visual impairments preferred physical guidance to tactile modelling.

Use of peer tutors

The use of peer tutors was the third strategy under which the analysis is based on.

Teacher A stated that:

> *Normally I always involved the students themselves like the sighted colleagues to sighted colleagues, sighted student to visually impaired student, visually impaired students to visually impaired students, because when you do that they gain more understanding from their peers.* (A verbatim expression by one teacher).

Teacher B also added:

> *When the blind student understands the activities and does it very well, then I allow the person to describe the activities or help the other total blind student to perform, because they understand themselves better than you the teacher.* (A verbatim expression by another teacher).

According to the statements made by the teachers it was revealed that the use of peer tutors as a strategy played a great role in the performance of students with visual impairments in physical education activities. It was confirmed from their responses that they used peer tutoring to include students with visual impairments in physical education activities.

4.1.5 Research Question 5: What resources are available to support students with visual impairments in participating physical education activities?

Concerning the resources available for the participation of students with visual impairments in physical education activities, two major sub themes emerged. These included the material resources and the human resources. For instance,

Teacher B stated that:

> *When we talk of resources available in this school, we have the material resources and personnel resources.* (A verbatim expression by a teacher).

Human resources

For the human resources available for including the students in physical education activities below are the comments made by the teachers

Teachers A said:

> *For the human resources, we have resource personnel, one adapted physical education teacher, 4 regular teachers but no orientation and mobility instructor.* (A verbatim expression by one of teachers).

Teacher B also stated that:

> *We have regular P.E teachers who teach the sighted students and as said earlier we also have one adapted P.E teacher but for orientation and mobility teacher we do not have but I believe when it comes to worse the resource teachers can assist in that.* (A verbatim expression by another teacher).

It can be clearly inferred here that human resources, which included regular physical education teachers, adapted physical education teachers and resource teachers, were available when including students with visual impairments in physical education activities.

However both teachers mentioned that the school did not have orientation and mobility instructors.

Material resources

The teachers mentioned some of the material resources available for the participation of students with visual impairments in physical education activities.

Teacher A mentioned that:

> *For the material resources, though they are few, we have some that we use to include the blind students. We have the balls, and the football field, very few field events equipment, we also have the clappers for both sighted and the visually impaired students. again, for the balls we have the bigger ones like the goalball, larger balls the futsal ball, football, goalball, medicine ball and the volleyball.* (A verbatim expression by another teacher).

Teacher B also added:

> *For the material resources we have variety of balls in sizes, shapes and weight, there is a playground where the students take part in the various activities. They are even working on new one which is more or less like a stadium where all the games can be played. Again instead of carpet we normally have enough mattresses that we use.* (A verbatim expression by another teacher).

Teacher B again noted that:

> *However the resources are very few material and the students are far more than balls which prevent us from teaching some of the activities intensively.* (A verbatim expression by another teacher).

From the teachers' comments it can be noticed that material resources such as variety of balls, playground, mattresses, clappers and equipment for field events were available for students' participation in physical education activities.

4.2 Analysis of Quantitative Data

This section provides analyses of the data generated from the questionnaire administered to students. The data were analyzed based on the research questions and a hypotheses raised to guide the study. In the analysis of the questionnaire data, the two extremities of the responses were combined, such as Strongly Agree (SA) and Agree (A) as one idea, and Strongly Disagree (DS) and Disagree (D) as one, for the purposes of discussions. The results of the frequency distributions of opinions expressed by respondents to each set of items for each research question were used for the data analysis.

4.2.1 Research Question 1: To what extent do students with visual impairments participate in physical education activities in the school?

Table 4 represents data on the extent to which students participate in ball games. It covers the questionnaire items 1 to 11 which covers students' participation in gymnastics, ball games, athletics and physical fitness activities. Below shows the responses of students

Table 4: Participation of Students in Physical Education Activities

Statement	Agree	Neutral	Disagree	Total
Gymnastics				
I do rolling and hanging on bars	40(66.7%)	5(8.3%)	15(25%)	60(100%)
Required skills are taught	44(73.3%)	3(5.0%)	13(21.6%)	60(100%)
Ball Games				
I am take part in ball games	48(80%)	0(0%)	12(20%)	60(100%)
I participate in Goalball	54(90%)	0(0%)	6(10%)	60(100%)
I participate in Football	46(76.7%)	0(0%)	14(23.3%)	60(100%)
Athletics				
I take part in field events	45(75%)	3(5%)	12(20%)	60(100%)
I take part in Broad jump	34(56.7%)	6(10%)	20(33.3%)	60(100%)
I participate in track events	42(70%)	1(1.7%)	17(28.3%)	60(100%)
I participate in sprint	36(60%)	5 (8.3%)	19(31.7%)	60(100%)
Physical Fitness				
I participate in physical fitness activities	55(91.7%)	0(0%)	5(8.3%)	60(100%)
I become fit after physical fitness activities	51(85%)	1(1.7%)	8(13.3%)	60(100%)
Total	**495 (75.0%)**	**24 (3.6%)**	**141 (21.4%)**	**660 (100%)**

Source: (Field Data, 2016)

Table 4 presents the frequency distribution of responses of the respondents which sought to find out the extent to which students with visual impairments participated in gymnastic activities, ball games, athletics and physical fitness activities. In terms of students' participation in gymnastics, the results showed that most of the respondents (66.7%) agreed that they participated in gymnastic activities and 25% of the same respondents disagreed, however 8.3% of them also had neutral idea about the statement. Further, 73.3% of the same respondents agreed that skills needed in gymnastic activities were included in physical education activities while 21.6% of the same respondents

disagreed with the statement. In sum, the responses from the items show that, students were greatly involve in gymnastics in the school (70%). Though few (23.3%) and (6.7%) disagreed and had neutral ideas respectively.

Further, it can be observed from table 4 that majority (80%), of the students with visual impairments agreed that they participated in ball games while 20% also disagreed. For their participation in goalball, 90% of the respondents agreed while 10% of them disagreed. Again, 76.7% of the respondents agreed that they participated in football whereas 23.3% of them disagreed. The overall response to these items for the participation of students in ball games showed that students with visual impairments greatly participated in the ball games during physical education lessons (82.2%). Though 17.8% of them disagreed

For athletics, 75% of the respondents agreed that they took part in field events during physical education activities while 20% of them disagreed with the same statements and 5% of them were neutral. Again, majority of the students (56.7%) agreed that they participate in long jump as one of the field events during physical education activities, but 33.3% of them disagreed with that statement while 10% of them were neutral. In terms of their participation in track events, 70% of the students agreed that they were involved in track events whereas few of them (8.3%) disagreed with the statement. Finally, 60% of the students agreed that they participated in sprint as a track events during physical education activities, 31.7% of them disagreed whilst 8.3% were neutral. It is evident that the students took part in athletics since majority of them (65.4%) agreed with the overall items.

Finally, the responses for physical fitness activities revealed that greater percentage (91% and 85%) of the respondents agreed that that they became fit when involved in

physical fitness activities respectively, it was clear that the students with visual impairments were not left out when it came to physical fitness activities during physical education. Though most of them agreed to these statements, few of them disagreed. For example 8.3% of them disagreed that they participated in physical fitness activities and 13.3% of them also disagreed that they became fit when they took part in physical fitness activities. However, the overall response showed that 88.3% of the students had positive views about their participation in physical fitness activities.

In summary, majority of the respondents (75.0%) gave positive response to their participate in physical education activities especially such as gymnastics, ball games, athletics and physical activities whiles few of them (21.4%) disagreed.

4.2.2. Research Question 2: What adaptations do teachers make to physical education activities to suit the needs of students with visual impairments in the school?

To answer this research question, frequency distributions and percentages of the respondents' views on the Likert scale Items numbered 12– 25 were generated and used. Table 5 shows the responses of students on the adaptations made to physical education activities in terms of instruction, instructional materials, environment and rules:

Table 5: Adaptations made to Physical Education Activities

Adaptations	Agree	Neutral	Disagree	Total
Adaptations made to instructions				
Instructions are adapted	47(78.3%)	2(3.3%)	11(18.4%)	60(100%)
I become satisfied when instructions are adapted	53(88.3%)	1(1.7%)	6(10%)	60(100%)
Made to the instructional materials				
Bigger balls are used in physical education activities.	38(63.3%)	2(3.3%)	20(33.3%)	60(100%)
Balls are painted with bright colours	32(53.3%)	6(10%)	22 (36.7%	60(100%)
Bells are placed in balls	47(77.7%)	2(3.3)	11(16.7%)	60(100%)
Goal posts are painted with bright colours.	16(26.6%)	4 (8.3%)	40(66.7%)	60(100%)
Bells are hanged on nets of goal post	15(25%)	1(1.7%)	44(73.3%)	60(100%)
Adaptations to physical environment				
Rubber carpets are used during physical education activities	22(36.6%)	1(1.7%)	37(61.7%)	60(100%)
Guided lines are used to prevent me from getting hurt and stepping out of the boundary	16(26.6%)	1(1.7%)	43(71.7%)	60(100%)
The environment is free of noise during physical education activities	22(36.7%)	0(0%)	38(63.3%)	60(100%)
Guide ropes are used for demarcating the lanes for running events	14(23.3%)	4 (6.7%)	42(70%)	60(100%)
Adaptations to rules				
Rules are simplified during physical education activities	46(76.7%)	2(3.3%)	12(20%)	60(100%)
The Number of players are reduced during physical education activities	40(66.7%)	2(3.3%)	18(30%)	60(100%)
The time of play is reduced during physical education activities	34(56.7)	5(8.3%)	21(43%)	60(100%)
Total	**442 (52.6%)**	**33 (3.9%)**	**365 (43.5%)**	**840 (100%)**

Source: (Field Data, 2016)

Table 5 above revealed responses from students on the adaptations made to physical education activities to suit students with visual impairment. It could be noticed that 78.3% of the students agreed that, instructions were adapted to include them in physical education activities. Again, 88.3% of them agreed that they became satisfied when instructions were adapted to suit their participation in physical education activities. However, 18.4% and 10% of the students also disagreed with the two items respectively whilst 3.3% and 1.7% also were neutral. The total response of the students in terms of the adaptations made to instructions during physical education activities showed that 83.3% of them agreed that instructions were adapted to suit their participation. However, 14.2% of the respondents showed that they did not agreed with the statement that instructions in physical education activities were adapted to suit their participation.

Again, the responses from students on the adaptations made to the instructional materials for including them in physical education activities revealed a composite percentage of 49.3% of the respondents agreeing to the fact that the instructional materials were adapted, a great percentage (45.7%) of the students also disagreed with that fact. However, majority of the respondent agreed with that statement, which means that instructional materials were indeed adapted to include students with visual impairments in the school. Most of the students (63.3%) agreed that bigger balls were used in physical education activities and 53.3% of the same students again agreed that balls with bright colours were used during physical education activities. Furthermore, it was noted that majority of the students (77.7%) agreed that bells were placed in balls to prompt them on the where about of the ball during play. A good number of the students (66.7%) also disagreed that goal posts were painted with bright colours during physical education

activities and on the issue of bells hanged on the nets of goal posts to prompt them when a goal is scored, 80% of the students disagreed. Yet, 26.6% and 20% agreed respectively to the two items. Again 73.3% of the students disagreed that bells were hanged on nest of goal post. The overall response of the respondents shows that instructional materials were adapted to suit the participation of students with visual impairments in the school (49.3%).

Table 5 further shows the responses of students on adaptation made to the physical education activities. The overall responses from the respondents (66.7%) disagreed that the environment was adapted to include them in physical education activities whilst 30.7% of them agreed. The analysis of the response of each item showed that most of the students responded negatively. For example the use of rubber carpets around the playground to prevent students from getting hurt and stepping out of the boundary (61.7% disagreed and 36.6% agreed). Again, for the use of guided lines being placed around the playground to prevent students from getting hurt and stepping out of the boundary (71.7% disagreed and 26.6% agreed). Further, 63.3% disagreed and 36.7% agreed that the environment was free of noise during physical education activities and finally 23.3% and 70% of the respondents agreed and disagreed respectively that guide ropes were used for demarcating the lanes for running events during physical education activities in the school.

The table finally shows the adaptations made to rules during physical education activities in the school. 76.7% of the respondents noted that rules were simplified to suit them during physical education activities while 20% of the same respondents disagreed with the same statement. Again, 66.7% of the respondent agreed that the number players were reduced in most of the physical education activities for them to effectively participate 30% of them disagreed. Further, most of the students (56.7%) agreed that the time of play

was reduced during physical education activities whereas 43% of them disagreed. All the responses when combined showed that 66.7% of them agreed that rules were adapted to suit them during physical education activities whilst 28.3% of them disagreed and the rest 5% were neutral.

In summary, it could be noted that apart from the adaptations made to the environment which majority of the respondents (66.7%) disagreed that it was adapted for them, it could clearly be seen that the majority of the respondents agreed that, the rules (66.7%), the instruction (83.3%) and the materials (49.3%) used in physical education activities were modified to suit their participation, it can therefore be concluded here that adaptions were made to physical education activities to suit students during physical education activities. The overall responses for the adaptation made to the physical education activities show that 52.6% of the respondents agreed that teachers made various adaptations to the activities to suit them whiles 43.5% of them disagreed.

4.2.3. Research Question 3: What challenges do students with visual impairments face in participating in physical education activities?

Research question 3 was concerned with the challenges students with visual impairments face when participating in physical education activities. Questionnaire items 26-40 were used to generate the frequency distributions and percentages of the respondents' opinions. These items were grouped, poor motor development, lack of confidence, lack of trained tutors, lack of adapted environment and lack of adapted environment. Table 7 shows the responses of students:

Table 6: Challenges of Students in Physical Education Activities

Statement	Agree	Neutral	Disagree	Total
Lack motor skills development				
I find it difficult to perform skills and activities that involve the use of hands	27(45%)	0(0%)	33(55%)	60(100%)
I find it difficult to perform skills and activities with my fingers	24(40%)	1(1.7%)	35(58.3%)	60(100%)
I cannot walk during physical education activities	19(31.7%)	0(0%)	41(68.3%)	60(100%)
I cannot run during physical education activities	28(46.7%)	0 (0%)	32(53.3%)	60(100%)
I cannot jump during physical education activities	30(50%)	1(1.7%)	29(48.3%)	60(100%)
I find it difficult to balance during physical education activities	31(51.7%)	2(3.3%)	27(45%)	60(100%)
Lack of confidence				
I may not perform well during physical education activities	34(56.6%)	2(3.3%)	24(40%)	60(100%)
I am afraid of getting hurt during physical education activities	37(61.7%)	0(0%)	23(38.3%)	60(100%)
Lack of trained tutors				
Few available adapted physical education tutors	47(78.3%)	1(1.7%)	12(20%)	60(100%)
Inadequate preparation of tutors	30(50%)	3(5%)	27(45%)	60(100%)
Lack of adapted physical environment				
The environment is not adapted during physical education activities	33(55%)	1(1.7%)	26(43.3%)	60(100%)
Lanes for running events are not demarcated during physical education activities	38(63.3%)	3(5%)	19(31.7%)	60(100%)
Lack of adapted materials				
Few balls with bells are available for physical education	29(48.4%)	6(10%)	25(36.7%)	60(100%)
Few available bright coloured material for physical education activities	30(50%)	5(8.3%)	25(41.7%)	60(100%)
Ball with embossed letters are not used during physical education activities	46(76.7%))	1(1.7%)	13(21.6%)	60(100%)
Total	**483 (53.7%)**	**26 (2.8%)**	**391 (43.4%)**	**900 (100%)**

Source: (Field Data, 2016)

Data presented in Table 6 shows the views of students on the challenges students face during physical education activities. Under motor development skills, most of the respondents (55%) disagreed that they found it difficult to perform skills and activities that involve the use of hands, whereas 45% of them agreed. Again, 58.3% of the respondents disagreed that they found it difficult to perform skills and activities that involve the use of fingers while 40% of them agreed. Further, 68.3% and 53.3% of the students respectively disagreed that walking and running were motor activities that they could not perform during physical education activities. However, majority of the students agreed that Jumping (50%) and balance (51.7%) were motor activities that they could not perform during physical education activities. Therefore, majority of the students (54.7%) disagreed that motor development was a challenge they faced during physical education activities compared to 44.2% of them who agreed and 1.1% who were neutral. It can therefore be concluded that respondents did not see themselves as having poor motor development.

It was clear again from table 6 that majority of the students (59.2%) lacked self-confidence during physical education activities. It can be deduced from these items that, most of the students had positive views about the feeling that they may not perform well during physical education activities (56.7%) and they being afraid of getting hurt during physical education activities (61.7%). Though most of them agreed with these statements few of them also disagreed (40% and 38.3%) respectively.

The table above further shows data gathered from the students on the lack of trained tutors for physical education activities as a challenge. With a composite frequency distribution of 64.2% agreeing and 32.5% disagreeing, it is clear that, most of the students had positive views about lack of trained tutors as one of the challenges they face during

physical education activities. 78.3% of the students agreed whilst 20% disagreed that there were few trained adapted physical education tutors for including them in physical education activities. Again, 50% of the same students also had a positive view that physical education tutors were not prepared adequately to involve them in physical education activities while 45% of them disagreed.

Also, a good number of the respondents agreed that lack of adapted environment was a challenge they face (59.2%). In line with the composite frequency distribution, 55% of the students agreed that adapted environment which included the playground was not adapted for their involvement. Again, 63.3% of the respondents also agreed that lanes for running events were not demarcated during physical education activities. Few of the respondents however disagreed with these statement respectively (43.3% and 31.7%) and the rest which were 1.7% and 5% were neutral.

Finally, the table also presents the frequency distributions of views expressed by the respondents on the lack of adapted materials as a challenge students' face during physical education activities. Majority of the respondents (58.3%) agreed that lack of adapted materials was one of the challenges students face during physical education activities, whereas 35% of them disagreed. For each of the items most of the respondents agreed that balls with bells were few (48.4%), few bright coloured materials(50%) and lack of materials with embossed letters for including students with visual impairments(76.7%) were some of the challenges they faced.

In summary, apart from poor motor development where majority (54.7%) of the students disagree that was a challenge they faced, the rest which included lack of confidence (59.2%), lack of trained tutors (64.2%), lack of adapted environment (59.2%)

and lack of adapted materials (58.3%) agreed upon to be some of the major challenges the students face during physical education activities. Therefore majority of the students agreed (53.7%) that they faced some challenges during physical education activities.

4.2.4 Research Question 4: What strategies do teachers use to involve students with visual impairment in physical education activities?

Items 41 to 51 of the student questionnaire were used to explore the strategies teachers use in involving students with visual impairments in physical education activities. Table 7 present the views of the respondents on the use of verbal description of instructions, demonstration and peer tutors as some of the strategies used by teachers to involve them:

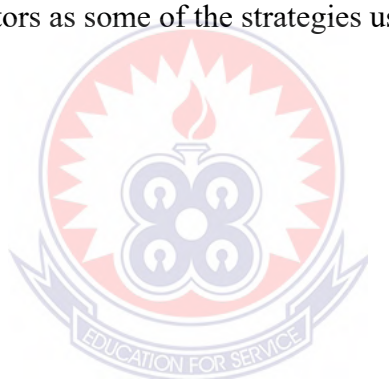

Table 7: Strategies for Including Students in Physical Education

Statement	Agree	Neutral	Disagree	Total
Verbal description of instructions				
Verbal instructions are used during physical education activities	45(75%)	2(3.3%)	13(21.7%)	60(100%)
Directional words are used during physical education activities	44(73.3%)	3(5.0%)	13(21.6%)	60(100%)
Landmarks are used during physical education activities	32(53.3%)	1(1.7%)	27(45%)	60(100%)
Verbal descriptive feedback are used during physical education activities	36(60%)	0 (0%)	24(40%)	60(100%)
Verbal prompts are used during physical education activities	11(18.3%)	1(1.7%)	48(80%)	60(100%)
Use demonstration				
Physical guidance is used during physical education activities	43(71.7%)	2(3.3%)	15(25%)	60(100%)
Teachers use tactile modeling during physical education activities	45(75%)	1(1.7%)	14(23.3%)	60(100%)
I prefer physical guidance to tactile modeling during physical education activities	44(73.3%)	4(6.7%)	12(20%)	60(100%)
Use of peer tutors				
Peer tutors to are used during physical education activities	39(65%)	0(0%)	21(35%)	60(100%)
I perform better when I am taught by my peers	45(75%)	2(3.3%)	13(21.7%)	60(100%)
I socialize with my sighted peers when they assist me in physical education activities	50(83.3%)	0(0%)	10(16.7%)	60(100%)
Total	**434 (65.8%)**	**16 (2.4%)**	**210 (31.8%)**	**660 (100%)**

Source: (Field Data, 2016)

From the analysis of the viewpoints of the students from table 7, it was obvious that teachers used verbal description of words to include students with visual impairments in physical education activities. This can be linked to the composite of the frequency

distribution of 57.3% of the students who agreed and 41% of the students who disagreed. The students views meant that, verbal instructions (75%), directional words (80%), landmarks (53.3%), except verbal prompts (18.3%) were used during physical education activities. Though majority of the students agreed with most of these items, 21.7%, 18.3%, 45%, 40% and 80% of them disagreed respectively with each of the statements, which means that verbal prompts was not used.

The table again, presents the results of the responses of students on the use of demonstration for their participation in physical education activities. The results showed that, 71.7% of them agreed and 25% disagreed that teachers use physical guidance as a form of demonstration to tell students what to do during physical education activities. With respect to teachers using tactile modelling as a form of demonstration, 75% of the students agreed while 23.3% disagreed. The result again revealed that majority of the students (73.3%) preferred physical guidance to tactile modelling as a form of demonstration while 20% of them stated otherwise. However, for the combination of all these results, majority of the students (73.3%), agreed that demonstration was used as one of the strategies to involve students with visual impairments during physical education activities.

Again the same table shows the responses of the students on the use of peer tutors by teachers to involve students with visual impairments in physical education activities. When Students were asked whether teachers use their peers to help them to effectively take part in physical education activities, 65% of them agreed while 35% disagreed. Again, one of the items was on whether students perform better when they are taught by peer tutors and 75% agreed while 21.7% disagreed. Finally the students were asked if they were able to socialize themselves with the sighted student when they assist then in physical education

activities. Majority (83.3%) of the students agreed with 16.7% disagreeing. For the combination of the result under the use of peer tutors, majority (74.4%) of the students had positive views about the use of peer tutors as a strategy to include them in physical education activities in the school though few of them (24.5%) disagreed.

On the whole it can be deduced from items table 7 that, teachers used strategies such as verbal description of instructions (57.3%), demonstration (73.3%) and peer tutors (74.4%) to include students with visual impairments in physical education activities in the school. Therefore a sum of 65.8% of the students agreed that the above strategies were used to include the in physical education activities.

4.2.5. Research Question 5: What resources are available to support students with visual impairments in participating in physical education activities in the school?

Items 52 to 58 of the questionnaire were used to answer this research question. Table 8 below presents the responses from students in terms of human resources and the material resources available in the School:

Table 8: Resources Available for Including Students in Physical Education Activities

Statement	Agree	Neutral	Disagree	Total
Human resources				
Regular physical education teachers are available during physical education activities	48(80%)	1(1.7%)	11(18.3%)	60(100%)
An adapted physical education teacher is available for physical education activities	49(81.6%)	1(1.7%)	10(16.7%)	60(100%)
Orientation and mobility instructor are available during physical education activities	20(33.3%)	4(6.7%)	36(60%)	60(100%)
Material resources				
There are variety of balls during physical education activities	35(58.3%)	1(1.7%)	24(40%)	60(100%)
There are enough balls for during physical education activities	19(31.7%)	1(1.7%)	40(71.7%)	60(100%)
There is a playground where I do physical education activities	45(75%)	1(1.7%)	14(23.3%)	60(100%)
Guide ropes are available for physical education activities	16(26.7%)	8(13.3%)	36(60%)	60(100%)
Rubber carpets are available for physical education activities	13(21.7%)	2(3.3%)	45(75%)	60(100%)
Total	**245 (51.0%)**	**19 (4%)**	**216 (45%)**	**480 (100%)**

Source: (Field Data, 2016)

From table 8, it can be generally noted that most of the students (51%) of the respondents agreed that there were resources available for including them in physical education activities whilst 45% of them responded otherwise. In terms of the availability of human resources, 65% of the respondent agreed that were human resources in the school. For example, for regular education teachers, 80% of the students agreed and 18.3% disagreed that they were available during physical education activities. Again, 81.6% and 16.7% agreed and disagreed respectively that adapted physical education teachers were

available for physical education activities. However, 33.3% and 60% of the students agreed and disagreed respectively that orientation and mobility instructors were available for physical education activities.

The same Table 8 shows the responses of students on the materials resources available for the participation of students with visual impairments in physical education activities. It can be clearly observed here that apart from the balls (58.3%) and playground (75%) which majority of the students agreed to be available, the students disagreed on the rest which included, enough balls (71.7%), guide ropes (60%) and rubber carpets of being available. On the whole, 42.7% and 53% of the students agreed and disagreed respectively that material resources were available for their participation in physical education activities. This shows that enough material resources were not available for their participation in the school.

To sum up, it can be deduced from the results that for the resources available most, students (65%) agreed that human resources were available while majority (53%) also disagreed that material resources were available. However the composite frequency distribution of all the items under resources shows that there were resources available.

4.2.6 H_1. There is a significant difference between the extent to which Students with Low Vision and those with Total Blindness Participate in Physical Education Activities.

The study posed a hypothesis which stated that, students with low vision will participate in physical education more than students with total blindness. An independent-samples t-test was conducted to compare the participation of students with low vision and those with total blindness in physical education activities. Table 9 represent the result of the test.

Table 9: Independent Samples t-test Result for the Extent to which Students Participate in Physical Education Activities

	Type of visual impairments		*T*	*Df*
	Blindness	Low vision		
Participation of students	3.09 (.45)	3.28 (.41)	1.67	58

Source: IBM SPSS Analysis

Table 9 shows the results of the independent samples t-test analysis on the extent to which students participate in physical education activities. The results of the test shows that there was no statistically significant difference in the scores for students with blindness (M=3.09, SD=.45) and students with low vision (M=3.28, SD=.41); [t (58) =-1.67, p=.96, p>.05]. Therefore the hypothesis was rejected. This result therefore implies that both students with blindness and low vision participate in physical education activities in the school.

The eta squared formula was used to calculate the magnitude of the differences in the mean value of the two categories of students with visual impairments. Below is the calculation

$$\text{eta squared} = \frac{t^2}{t^2 + (N1 + N2 - 2)}$$

$$\text{eta squared} = \frac{1.67^2}{1.67^2 + (33 + 27 - 2)}$$

$$\text{eta squared} = .04$$

The magnitude of the differences in the mean was very small (eta squared=.04). This means that there was only 4% of the variance in the students' participation which explains that the difference between the extent to which students with blindness and those with low vision participated in physical education was very small and therefore insignificant.

CHAPTER FIVE

FINDINGS AND DISCUSSIONS OF RESULTS

5.0 Introduction

This chapter presents the findings and discussions of results for the study. The findings are discussed in line with the key themes raised in the interview guide and the questionnaire items.

5.1. To what extent do students with visual impairments participate in physical education activities in Wenchi Methodist Senior High School?

The analysis of the data collected from the teachers and students respectively revealed elements that show the extent to which students with visual impairments participate in the various physical education activities in the school. From the analysis of the data, it was obvious from the respondents that, the students participated some aspect in gymnastics, ball games, athletics and physical fitness activities.

On the extent to which students with visual impairments participate in gymnastics, the teachers commented that the students were involved in the rolling, hanging on bars and handstand aspect which Amade-Escot and Bennour (2016) mentioned as some of the basic skills needed in gymnastics that could be learnt easily. However, the teachers mentioned that due to lack of resources available for including students with visual impairments in gymnastics the students were not able to take part in intensive gymnastics. This was also in line with an observation made by Herold and Dandolo (2009) where a teacher stated that, centrally devised resources suitable for gymnastics were not available for involving students with visual impairments in gymnastics in the school they conducted their research.

Similarly from the views of the students, it was noted that majority (70%, 82.2%, 65.4% and 88.3%) of them had positive views about their participation in physical education activities. This confirms what the teachers stated that during physical education activities, students were never excluded but rather allowed to participate in the activities. Again, from the analysis of the students' responses (66.7% and 73.3%), it was clear that the students did rolling and hanging on bars in gymnastics and the skills needed in gymnastics were included for their participation. In line with these findings, Morley et al. (2015) also conducted a study whose results revealed that gymnastics was one of the activities that pupils with special educational needs were easily included in the mainstream settings.

Again, it was evident from the comments of the teachers and responses of the students that students with visual impairments participated in ball games such as goalball and football. For example, 80% of the students agreed that they participated in ball games such as football (90%) and goalball (76.7%). This result is contrary to the findings from a study conducted by Lieberman et al. (2006), which revealed that students with visual impairments were not involved in balls games such as football. Similarly, findings from a study conducted by Dakwa (2011) also revealed that students with visual impairments were involved in only paper football as a football game in the school the research was conducted. Also, the teachers noted that, students were not allowed to participate in ball games that involve the intensive use of the sight such volley ball and tennis. However, Gomes-da-Silva et al. (2013) conducted a study and the findings revealed that participation of students with visual impairments in ball games especially goalball enabled students to pay more attention to their whole body

Another aspect that was looked at was students' participation in athletics. From the analysis, it was revealed that students with visual impairments (65.4%) participated in athletics in the school. However, both the teachers and students stated that the athletics that the students took part in were specialized ones which included sprint such as 50 meters -100 meters dash, standing broad jump and shot put. Moreover, all these activities were done with ringing of bells, lead runners, whistle and clappers to direct students to where to end the activity. This result is contrary to Gawlik and Zwierzchowska (2006) whose result revealed from a study they conducted that, students with visual impairments performance was poor in standing long jump during athletic activities due to lack of participation.

Finally, concerning students' participation in physical fitness activities, both teachers and students made it clear that students with visual impairments were greatly involved. According to the teachers, this was an activity that both students with and without visual impairments took part together without much adaptations specifically for the blind. Majority of the students (91.7%) also responded positively to the questionnaire that they were involved in physical fitness activities. According to Szekeres and Dorogi (2002) people who take part in sports on regular basis do not only experience an increased level of physical fitness but also become more independent. The finding from this study revealed that students became fit, gained more confidence and became more independent when they were involved in physical fitness activities. This supports the findings of Szekeres and Dorogi which revealed that when students are involved in physical fitness activities, they become very fit and are able to move around independently.

In sum, the results showed that students with visual impairments participated in most of the various physical education activities in the school. This support the flow theory

which states that, people experience the flow when they fully participate in various activities, to the extent that, they forget about all the external factors that may distract them. However, most of the activities were adapted to suit their full participation. Though an activity like goalball is specially designed for students with visual impairments as stated by Ardito and Roberts (2007) students without visual impairments were also engaged to allow them to have a feel of the game, as recommended by Gomes-da-Silva, et al. (2013). Other specialized activities also pointed out included, 50 metres to 100 metres dash and standing broad jump that students with visual impairments participated in.

5.2. What Adaptations are made to physical education activities to suit the needs of students with visual impairments?

As noted in the previous chapter, it was evident from the analysis that, teachers made various adaptations to the various physical education activities for effective participation of students with visual impairments. According to the comments made by the teachers some of the major adaptations made to the activities included, adaptations made to the instructions, instructional materials, physical environment and the rules. These adaptations according to Montagnino (2001) help students with visual impairments to fully participate in physical education activities. Similarly, the responses from the students revealed that, adaptations were made to physical education activities in terms of the instructions (83.3%), instructional materials (49.3%) and rules (66.7%). However, most of the students (66.7%) were of the view that the environment was not adapted to suit their participation in physical education activities which was contrary to the view expressed by the teachers.

Adaptations made to physical education instructions for effective participation emerged as one of the sub-themes under adaptations made to physical education activities for students with visual impairments. From the analysis of the data from the teachers and the students' response, it was revealed that, teachers made various adaptations to the physical education activities to suit students with visual impairments. According to the teachers one of the instructional adaptations made was breaking down of instructions into simple units which help students to follow the instructions effectively. Faison-Hodge and Porretta, (2004) stated that, when teaching students with disabilities instructions must be simple and concrete, in order to help students complete tasks easily.

The findings further revealed that when instructions are well adapted, it arouses the inner interest of students (Koeze, 2007). According to one of the teachers, after physical education activities lessons, some of the students often came to him to tell him how satisfied they were when they understood the instructions. Again most of the students (83.3%) stated that when instructions were well adapted they became satisfied which enabled them to participate fully in the various activities. This is in support of the flow theory which has to do with the kind of inner feeling of satisfaction and joy an individual gets when he or she is involved in an activity. This statement was again in line with Koez who stated that adapted instructions play a very important role in the satisfaction of students learning.

From the analysis, it can clearly be noted that, teachers made various adaptations to the various physical education activities through instructional materials. Most of the materials for teaching physical education to students with visual impairments are specially designed for their participation (Ocloo, 2011). These adaptations mentioned by the teachers

included, the use of bells in balls or putting the ball in noisy rubber bag to produce sound and use of pipe holes as goalpost to prevent students from getting hurt. This result is contrary to Lieberman, et al. (2006) who conducted a study on adolescents with visual impairments experience in general physical education classes, which findings revealed that students with visual impairments were often not involved in physical education activities because the teachers did not have the appropriate equipment that could be used to enhance their participation.

It was noted again from the findings (49.3%) that larger balls, use of bright colours on balls and placing of bells in balls were some of the adaptations made to instructional materials to include students in physical education activities. This was in line with Letcher (2016), who noted that the use of larger balls, brighter balls and balls with bells were some of the adapted materials used during physical activities for students with visual impairments. Majority of the students (66.7% and 80%), however, stated that goal posts were not painted with bright colours and bell were also not hanged on the nets of the goal posts as suggested by Foley et al. (2008).

In terms of the adaptations made to the physical environments during physical education activities, it was evident from the findings that, apart from the removal of obstacles such as stones and sticks from the playground during physical education activities such as goalball, nothing much was done to the playground to ensure the safety of the students with visual impairments. This is in support of findings from Boateng (2007) which revealed that students with physical disabilities often were not able to move around freely in restricted environment due to obstacles such as stones, potholes and open gutters.

Though the teachers gave two different responses to the use of the guide ropes in physical education activities, the findings from the students also revealed that much (66.7%) adaptations were not made to the environment to include them in physical education activities. Again the findings revealed that, rubber carpets were not used on the floor to prevent students from getting hurt (61.7%), guided lines were not used to prevent students from stepping out of bound (71.7%), the environments was not free of noise (63.3%) and the lanes were not demarcated during running events(70%). However, Montagnino (2001) and Letcher (2016) stated that, for effective participation of students in physical education activities most of these adaptations must be made specifically to the environment.

Finally, from the findings it was clear from the teachers comments that, some rules were only adapted during competitive games. However, during physical education lessons, rules were not adapted because concentration was mostly on the various skills. Again, it was noted that rules made were flexible during physical education lessons so that students with visual impairments will also feel part of the activities as stated by Perlman and Piletic (2012). Further, it was revealed that rules were simplified (76.7%), the number of players were reduced (66.7%) and the time of play was also reduced (43%) in most physical education activities. Luo (2000) stated that these adaptations must be seriously considered when including students with visual impairments in physical educations activities.

Generally, the findings indicated that apart from the environment which was not well adapted (66.7%), the rest of the elements which included the instruction (83.3%), materials (49.3%) and rules (66.7%) in physical education activities were modified to suit students' participation. This means that various adaptations were made to physical

education activities to facilitate the participation of students with visual impairments during such activities. This therefore motivated the students to flow into the activities as stated by Csikszentmihalyi (1975).

5.3 What challenges do students with visual impairments face when participating in physical education activities?

The findings from the teachers' responses revealed various challenges students with visual impairments faced when participating in physical education activities. For instance the teachers stated that one of the challenges the students faced was lack of adapted physical education materials for their effective participation. Gondo and Gondo (2013) noted from a study they conducted that, practical activities in physical education as a subject was generalized in nature and activities were not adapted to suit students with disabilities which was a major requirement in integrated schools. This challenge, according to the respondents made the students felt left out.

Poor motor development emerged as a challenge students with visual impairments face during the interview with the teachers. Both teachers stated clearly that poor motor development was indeed a challenge to students with visual impairments during physical education activities because they were mostly not able to run well even with the help of a guide, jump and have a stable balance. In comparing the sighted students with those with visual impairments, it was revealed that in terms of motor development, students with visual impairments perform far less than the sighted. This is in line with the finding of

Fotiadou et al. (2014) who stated that students with visual impairments' performance is mostly lower than the sighted when they were allowed to participate in the same activities.

However, the statement made by the teachers concerning poor motor development was contrary to the responses of the students. Majority of the students (54.7%) disagreed that poor motor development was a challenge they faced during physical education activities. Apart from jumping (50%) and balance (51.7%), most of the students disagreed that they found it difficult to perform skills that involved the use of the hands (55%), fingers (58.3%), walking (68.3%) and running (53.3%) during physical education activities. These findings may be as a result of the many opportunities given to the students to interact with the environment and with the sighted students during physical education activities (Magill, 2007). As stated by Csikszentimihalyi, in flow theory, no matter the challenges people face when taking part in an activity, they continue to participate in the activity until it is over.

Lack of confidence was another element that was considered under the challenges students with visual impairments faced during physical education activities. According to the findings of this study, the teachers stated that, students with visual impairments gained average confidence and occasionally very high confidence after they participated in a particular activity for a long time (Mishra & Singh, 2012). This is consistent with the flow theory which states that, flow theory deals with the kind of inner feeling of satisfaction and joy a person gets when he or she is involved in an activity, even if the activity is challenging. Therefore, with constant practice the urge of 'flow' sets in which made the students gain more confidence in the activities. The findings revealed that the confidence level of students with visual impairments became very low when participating in the same

activities with their sighted peers. This result is again is consistent with another findings from the Mishra and Singh study, which revealed that, the level of self- confidence of students with visual impairments is mostly lower than that of sighted students.

Similarly, from the findings, 59.2% of the students confirmed that lack of confidence was a challenge they faced during physical education activities as stated by the teachers. This may be due to the fact that, they had the feeling that, they may not perform well, get hurt when playing with the sighted or they may be laughed at during the activities as stated by Lieberman and Houston-Wilson (1999).

Apart from the two challenges that have been discussed already, lack of trained tutors also emerged as one of the challenges students with visual impairments face during physical education activities, it was revealed from the findings that, teachers who were trained in adapted physical education were few in the school (78.3%). According to the teachers, out of five teachers teaching physical education, none of them had been specifically trained in adapted physical education. Four of the teachers were regular physical education teachers while one was trained in regular physical education and special education and was the one teaching students with visual impairments physical education. These responses from both teachers and students agreed with the findings of Perkins et al. (2013) whose findings revealed that lack of trained physical education teachers to work with students with visual impairments was one of the main challenges students faced during physical education lesson. Lack of trained tutors affect students greatly, in the sense that, the students may not be able to take part in most of the activities (Lieberman & Houston-Willson 1999) and this compelled the teachers to concentrate on only the sighted students as noted by the teachers.

The findings again revealed that students faced a lot of challenges when it came to the physical environment. According to the teachers, the field where physical education activities took place was full of potholes and was not levelled which prevent the students from moving freely during physical education activities. These finding are similar to the findings of Boateng, (2007) which observed that students with physical disabilities faced challenges in moving freely around the environments due to obstacles such as stones, potholes and open gutters. Additionally, materials for adapting the physical environment was also limited which prevented teachers from involving students with visual impairments and those without visual impairments together. This posed a big challenge to students with visual impairments because the teachers mostly ended up involving only the sighted students. A study conducted by Owusu-Amoako (2015) revealed similar findings which stated that lack of adapted playground prevented pupils with visual impairments and the sighted pupils to be engaged together in physical activities.

It was again noted from the findings that majority of the students (55% & 63.3%) stated that the environment which included the playground and lane for athletic events were not adapted to suit their participation during physical education activities. A study conducted by Garedew (2011) revealed similar findings that the playground was one of the challenges students with visual impairments faced during physical education since it was mostly not appropriate in teaching both students with disabilities and those without disabilities together. In addition, the findings from Hemmingson's and Borell's (2002) study revealed that most students with physical disabilities in mainstream schools experienced barriers to participation in both physical and social environments which may be due to poor nature of the environment.

Findings from the teachers, revealed that though there were few materials mainly for the blind, most of the materials available were for sighted students and were not adapted to suit students with visual impairments which prevented them from participating in many of the activities available. This finding which is line with the finding of Asempa (2013) who stated that though many instructional materials were available in the school the study was conducted, they were not adapted to meet the needs of students with disabilities. When this happens students with visual impairments are ignored or are not even allowed to take part in the activities as noted by the teachers earlier.

Further, most of the students (58.3%) agreed that, balls with bells and brighter materials available for their participation were few. Again, embossed materials for including students with visual impairments in physical education activities were also not available. Garedew's (2011) research findings agreed with this finding which revealed that there were not enough and appropriate materials for including students with and without disabilities in the same activities. Agesa (2014) also stated that students with visual impairments mostly found it difficult to perceive the quality of materials because, the materials were mostly not embossed. The teachers further added that, materials such as bells that could be hanged on the net to produce sound and carpets were not available. Again, the adapted balls with bells specially made for the blind were very few for all the students with visual impairments to be engaged in smaller groups. This confirms the findings from a study conducted by Tadese (2012) which revealed that, limited materials were available for including students during physical education activities.

5.4. What strategies do teachers use to involve students with visual impairments in the physical education activities?

The findings of the study revealed, verbal description of instructions, use of demonstrations and use of peer tutors as some of the strategies teachers use to improve on the participation of students with visual impairments in the school.

Findings from the teachers revealed strategies such as the use of direct, vivid and simple but concrete instructions during verbal descriptions of instructions to improve on students understanding during physical education activities. Majority of the students (56%) also agreed that verbal description of instructions such as directional words, landmarks and verbal feedback were used to include them in physical education activities. All these show that the teachers indeed used verbal descriptions as one of the strategies to help students grasp concepts easily. Every single thing which was done during the activities were verbally described for students to follow and imitate. In line with this, Garaj et al. (2003) opined that, students with visual impairments must always be provided with detailed verbal descriptions of cues when they are in a very complex environment.

From the findings, demonstration emerged as one key strategy teachers used to enhance students' participation in the various physical education activities in the school. According to the teachers and the students, physical guidance and tactile modelling were used as forms of demonstrations to include students with visual impairments in physical education activities. These finding are in line with that of Obi et al. (2006) whose findings revealed that demonstration was one of the main strategies teachers used to include students with disabilities in physical education. However, one of the teachers and majority of the students (73.3%) responded that, students with visual impairments preferred the use of

physical guidance which involved the teacher performing a particular activity with the students to get the feel, rhythm, and motion of the movement given, to tactile modelling. This was in line with a research conducted by Cieslak (2013) whose results indicated that most students with visual impairments preferred physical guidance to tactile modelling with very few of them preferring both as stated by one of the teachers. Another study conducted by Shelton (2013) however revealed that understanding among students become high when demonstrations are used for teaching practical subjects. The students may therefore prefer physical guidance due to the reason given by Shelton.

The final strategy that was revealed during data analysis was the use of peer tutors during physical education activities. During teaching, teachers sometimes used sighted students as peer tutors to help students with visual impairments or students with visual impairments who understood the concept as peers to help their colleagues with visual impairments. According to the findings, since the students understood each other better, it was better to use it to help them get the concept of the activities. Zwald (2008) stated that the use of trained peer tutors was one of the instructional strategies many teachers used for including students with visual impairments into the regular class room. When this is done properly it increases their level of confidence and socialization among both the sighted students with visual impairments and the sighted students (Loke & Chow, 2007).

The findings from the students confirmed the use of peer tutors as a strategy for including them in physical education activities. It was also revealed from the findings that, majority (75% & 83.3%) of the students responded positively that they learned easier, performed better and were able to socialize with their sighted peers when they were taught by their peers. This result agrees with Mirzeoglu (2013) findings which showed that

students with visual impairments performed better when peers are used during teaching and learning. Again, according to the findings of Wiskochil et al. (2007) the use of peer tutors during physical education lessons is beneficial to students with visual impairments to be included in the general physical education class.

5.5 What resources are available for supporting students with visual impairments in physical education activities?

On the issue of the resources available for including students with visual impairments in physical education activities in the school, the teachers mentioned resources which could be categorized into two; human and material resources.

For the human resources, the teachers mentioned an adapted physical education teacher, resource teachers and regular physical education teachers as the human resources available for including students with visual impairments in physical education activities. Further, a greater number of the students (80% & 81.6%) agreed respectively that regular physical education teachers and adapted physical education teachers were some of the human resources available for including them in physical education activities. The teachers and majority of the students stated that there were no orientation and mobility instructors in the school for including them in physical education activities. These findings were contrary to Lieberman (2011) and Winnick (2011) who noted that orientation and mobility instructors are important human resources needed for including students with visual impairments in physical education activities. The teachers added that they needed more physical education teachers especially the adapted physical education teachers for including students with visual impairments during physical education activities. According

to the findings from a study conducted by Bevans et al.(2010) the availability of a greater number of physical educators per student impact student activity levels by reducing the amount of session time devoted to class management (Lieberman, 2011).

The second and final resource that was considered was the material resources available in the school and they included variety of balls, as in shape, size, weight and balls with bells, playground and mattresses and very few field events' equipment. The teachers however made it clear that material resources though available, were extremely few which caused challenges to the students and teachers during lesson (Tedekel, 2010). According to the teachers most of the activities were not taught effectively as they wished, due to limited materials. Many of the students (53%) however disagreed that resources were available for their participation in the activities. In terms of availability of variety of balls and playground, majority (58.3% & 75%) of the students agreed respectively that they were available. However, most of these students (71.7%, 60% & 75%) disagreed respectively that there were enough balls, guide ropes and carpets available for their participation. It was generally concluded that few material resources were available during physical education activities. The finding is in line with a study conducted by Tadese (2012) whose finding revealed that, there was limited resources available that could be used to include student with visual impairments in physical education in the school the study was conducted.

5.6 H_1. There is a significant difference between the extent to which students with low vision and those with blindness participate in physical education activities.

The findings showed that there was no significant difference between the extent to which students with low vision and those with blindness participated in physical education activities. The results of the data analysis showed that the difference in mean scores of the two groups of students was very small ($p = .96$), suggesting that there was no significant difference between the two groups. Further, the magnitude of the difference in the mean score was found to be very small (eta squared = .04) which also implies that a very small percentage (4%) of the variance is influenced by this findings which therefore revealed that both students with blindness and those with low vision had equal opportunities to participate in physical education activities. This finding is contrary to that of Demirturk and Kaya (2015) which revealed that, the physical activity level of adolescents with blindness was lower than that of adolescents with low vision.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

The purpose of the study was to find out the extent to which students with visual impairments participated in the various physical education activities in Wenchi Methodist Senior High School in the Brong Ahafo Region of Ghana. It specifically sought to:

- Find out the extent to which students with visual impairments participate in physical education activities in Wenchi Methodist Senior High School.
- Examine the adaptations made to physical education activities to suit the needs of students with visual impairments in the school.
- Find out the challenges students with visual impairments face in participating in physical education activities in the school.
- Identify the strategies teachers use to involve students with visual impairments in physical education activities in the school.
- Find out the resources that are available to support students with visual impairments in participating in physical education activities in the school.

Five research question and one hypothesis were developed to guide the study. The flow theory by Csikszentmihalyi was adopted to guide the study. The concurrent mixed research approach using the descriptive survey design was also used. A likert scale type questionnaire was used to collect the data from 60 students with visual impairments and 2 tutors teaching physical education. Data from the interviews were analysed using themes that emerged from the responses of the respondents, while data from the questionnaire was

also analyzed via Statistical Product and Service Solutions (SPSS) version 21.0, to generate the percentages on frequent count.

6.1 Summary of Major Findings

The major findings are summarized below:

6.1.1 Extent to student's participation in physical education activities

The result revealed that, students with visual impairments participated in physical education activities in the school. The findings revealed that the students participated greatly in gymnastics where skills such rolling, handstand and hanging on bars were included. However, due to lack of resources the students were not involved in intensive gymnastics.

Participation in ball games was another aspect that was looked at during physical education activities. The students and teachers indicated that students with visual impairments participated in ball games such as football and goalball. However, it could be noted that students did not participate in ball games which involved the intensive use of the sight such as tennis and volleyball.

Athletics was one of the physical education activities that students participated in. Field events such as long jump or standing broad jump and shot put were some of the athletics the students were involved. It was again revealed that the students were involved in track events such as sprint which include 50 meters to 100 meter dash.

It was finally revealed that students with visual impairments took part in physical fitness activities. It was one of the activities the students participate in without much

adaptations. It was noted again that students with visual impairments became very fit when they were involved in physical fitness activities**.**

6.1.2 Adaptations made to physical education activities

The study revealed the adaptations that were made to the various physical education activities. These adaptations included, adaptations made to the instructions, instructional materials, the environment and the rules. For the adaptions made to the instructions for example, it was revealed that, teachers' task analysed the instructions to help students to follow the instructions effectively. The finding again revealed that students become satisfied when instructions were adapted to suit them.

Further, the findings revealed the adaptations made to the instructional materials in physical education activities. Adaptations such as use of bells in balls or putting balls in rubber to produce sounds, using bright coloured balls and the use of pipe holes as goal post was used to prevent the students from getting hurt.

Again, adaptations made to the physical environment was also looked at and the results showed that obstacles such as stones and sticks were removed from the playground to prevent students from getting hurt. However, it was revealed that much adaptations were not made to the physical environment. For example, no carpets were laid on floor for students in games such goalball. There were also no guide ropes to demarcate lanes for the various activities and the environment was mostly not free of noise during physical education activities.

Finally, adaptations made to rules were looked at, as one of the adaptations teachers made to physical education activities. The findings revealed that rules were adapted but only during competitive games. The findings also revealed that, teachers mostly concentrate on the skills needed in physical education activities which further allow students to participate freely without any stressed.

6.1.3 Challenges students face in participating in physical education activities

The findings revealed the challenges students with visual impairments faced challenges in physical education activities. For instance, it was revealed from the teachers' comments that students with visual impairments faced a major challenge when it came to motor development when compared with their sighted peers. However, most of the students disagreed with them, noting that, apart from balance and jumping that they faced challenges in terms of motor development, they could do activities that involved the use of the fingers, hands, walking and running.

The results of the findings again showed that students with visual impairments lacked confidence when it came to physical education activities. It was revealed that the confidence level of students with visual impairments became very low when participating in the same activities with sighted students, because they thought they may not perform well or may get hurt.

Further, it was revealed that, limited trained tutors was another challenge students faced during physical education activities. The teachers available for including students were very few and the one who taught students with visual impairments was not an adapted physical education teacher.

Again, the results of the study revealed that lack of adapted environment was one of the challenges the students faced during physical education activities. The playground according to the finding was full of potholes and were not levelled for free movement among the students. It was noted that lack of materials for adapting the environment was one of the reasons why the teachers were not able to adapt the environments for effective participation of the students.

The final challenge that emerged during the study was lack of adapted instructional materials. According to the findings though there were many materials, few of them had been adapted to include students with visual impairments. Also, it was noted that, materials such as bells that could be hanged on the net to produce sound when a goal is scored and carpets were not available during physical education activities.

6.1.4 Strategies for involving students with visual impairments

It was found out that teachers teaching physical education used many strategies during physical education activities. For verbal description of instructions which was one of the strategies teachers used to include students with visual impairments in physical education activities, it was revealed that teachers used direct, vivid, simple but concrete instructions, directional words, land marks and verbal description of feedback to include students.

It was again, revealed from the findings that demonstration was another strategy teachers' used during physical education activities. These demonstrations which included physical guidance and tactile modelling were mostly used to include the students in the various activities. The findings however, revealed that though these two forms of

demonstrations were used, students preferred the physical guidance to the tactile modelling.

The final strategy that emerged during the study was the use of peer tutors. It was revealed that the teachers used sighted students and students with visual impairments who understood the concepts as peer tutors for students with visual impairments. According to the findings when this is done successfully, students are able to perform better and socialize with their sighted friends.

6.1.5 Resources available for students with visual impairments

The resources that emerged from the study included human and materials resources. The findings revealed that human resources were available for including the students in the various activities. Some of the human resources that were revealed to be available included, physical education teachers and an adapted physical education teacher.

From the findings it was revealed that material resources available included, variety of balls and playground where students participated in physical education activities. However, material resources such as guided ropes for demarcating the lane and carpet for the ground were not available. Based on these findings, it was clear that few material resources were available for including the students in physical education activities.

6.2 Conclusion

The study concluded that students with visual impairments participated in some of the physical activities their sighted colleagues participated in. Some of these activities included, gymnastics, ballgames, athletics and physical fitness activities. However, the

students were not allowed to participate in intensive activities due to lack of resource and games which make intensive use of the sight. Secondly, various adaptations were made to the various physical education activities for students to successfully participate. These adaptations included, adaptations made to the instructions, instructional materials and the rules. The environment was revealed not to be fully adapted for student's participation.

However, students faced challenges in terms of their level of confidence, trained tutors and adapted physical environments that can help them to participate fully in the various physical education activities in the school. Yet there was a disagreement between students and teachers on the motor skill development of the students. Again, strategies teachers used to include the students included, verbal description of instruction, demonstration and peer tutoring.

The result also revealed that for students with visual impairments to participate in physical education activities effectively, there is the need for both human and material resources to be available. The findings rather showed that the resources available were few.

6.3 Recommendations

These recommendations were made based on the findings of this study:

- Students with visual impairments should participate in more intensive physical education activities such as cartwheel and round off in gymnastic, basketball, volleyball and showdown in ballgames, high jump and javelin in athletics and skipping, lime and spoon, sack race and tug games in physical fitness activities.
- The school should train teachers to adapt physical education activities, especially the environment.

- The school should provide opportunities for the students to increase their level of confidence through more participation, and allocation of needed materials that help develop students' motor skills.
- Again, teachers should use other strategies such as one-on-one teaching and group teaching to include students with visual impairments in physical education activities.
- Finally, the school should provide enough resources, such adapted physical education teachers, orientation and mobility instructors, carpets and guide ropes for including students with visual impairments in physical education activities

6.4 Suggestions for Future Research

The current research was based on the participation of students with visual impairments in physical education activities in Wenchi Methodist Senior High School. It is suggested that future studies should be conducted in the areas discussed below:

1. The involvement of students with blindness in physical education activities in pilot inclusive Senior High Schools in Ghana.
2. The competence of physical education teachers in adapting physical education activities for students with visual impairments in selected schools in Ghana.
3. Level of motor development among students with visual impairments during physical education activities in Ghana.

6.5 Contribution to Knowledge

This present study contributed to knowledge. This is because very little research in Ghana was available to the researcher in the participation of students with visual impairments in physical education activities. The study provides an in-depth insight into the extent to which students with visual impairments participated in the various physical education activities in Ghana. Secondly, the study highlighted the various adaptations made to physical education activities in the school which help the teachers to broader knowledge about the adaptations that can be made. Again, the study contributed to knowledge by revealing the various challenges students with visual impairments faced during physical education activities and ways they can be addressed. Also, the study also showed that different strategies could be used to include students in physical education activities. Further, this study provides information on the various resources available for including students with visual impairments in physical education activities. Finally , this study offers support to already existing research findings on the variables that contribute to students with visual impairments participation in physical education activities, and goes a step further to provide information specifically on Ghanaian students with visual impairments.

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APPENDIX A

DEPARTMENT OF SPECIAL EDUCATION

UNIVERSITY OF EDUCATION, WINNEBA (UEW)

OFFICE OF THE HEAD OF DEPARTMENT

Our Ref: October 27, 2016

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…….

Dear Sir/Madam,

LETTER OF INTRODUCTION

I write to introduce to you, Ms. Alice Avornyo, an MPhil student of the Department of Special Education of the University of Education, Winneba, with registration number 8150150010.

She is currently working on her thesis on the topic: "*Participation of students with visual impairments in physical education activities in Wenchi Methodist Senior High School in the Brong Ahafo Region of Ghana*".

I should be grateful if you could give her the needed assistance to enable her administer her questionnaire and conduct interviews with both the students and the teachers. This is part of the requirements to complete her programme.

Counting on your cooperation.

Thank you.

Yours faithfully,

YAW NYADU OFFEI (PHD)
AG. HEAD OF DEPARTMENT

APPENDIX B

INTERVIEW GUIDE FOR PHYSICAL EDUCATION TEACHERS

Students with visual impairments involvement in physical education activities

1. To what extent do you involve students with visual impairments in physical education activities?

Prompts:

a. Explain it.

b. How do you involve your students in gymnastics?

c. What about ball games?

d. What of track and field events?

e. How about physical fitness?

Physical education adaptations

2. How are do you adapt physical education activities to suit the participation of students with visual impairments in the school?

Prompt:

a. Describe it.

b. What about the instructional materials?

c. What other adaptations are made to the environment?

d. What of instructions?

e. How about the rules?

Challenges of students in physical education activities

3. How would you describe the challenges students with visual impairments face when they are involved in physical education activities?

Prompts:

a. What challenges do students face in terms of their motor skills development during physical education activities
b. What of their confidence?
c. How efficient are the professional instructors?
d. What of the environment?
e. What about the materials?

Strategies teachers use to involve students

4. What strategies do you use to involve students with visual impairments in physical education activities?

Prompts:

a. Describe them.
b. How instructions are verbally described during physical education activities?
c. How do teachers demonstrate physical education activities?
d. What about the use of peer tutors?

Resources available for including students in physical education activities.

5. What resources are available for involving your students with visual impairments in physical education activities?

Prompts:

a. Explain it.

b. What materials resources are available in including students in physical education activities?

c. What of human resources?

APPENDIX C

UNIVERSITY OF EDUCATION, WINNEBA

FACULTY OF EDUCATIONAL STUDIES

DEPARTMENT OF SPECIAL EDUCATION

QUESTIONNAIRE FOR STUDENTS WITH VISUAL IMPAIRMENTS

INSTRUCTION

This questionnaire is designed to collect data from you that will help in a research about your participation in physical education activities. It is for educational purposes only and in no way shall it be associated with the respondent. The information given will be treated with the greatest confidentiality it deserves.

Please read the following statements and kindly select the answer that most accurately represents your thinking and feeling. You are required to either choose, A= Strongly agree, B= Agree, C= Neutral, D=Strongly disagree or E= Disagree for each statement. Thank you.

Participation of students in physical education activities

Gymnastics	**SA**	**A**	**N**	**D**	**SD**
I do rolling and hanging on bars					
Required skills are taught					
Ball games					
I take part in ball games					
I participate in goalball					
I participate in football					
Athletics					
I take part in field events					
I take part in Broad jump					
I participate in track events					
I participate in sprint					
Physical fitness					
I participate in physical fitness activities					
I become fit after physical fitness activities					

Adaptations made to physical education activities

Adaptions made to instructions	**SA**	**A**	**N**	**D**	**SD**
Instructions are adapted					
I become satisfied when instructions are adapted					
Adaptation made to instructional materials					
Bigger balls are used in physical education activities.					
Balls are painted with bright colours					
Bells are placed in balls					
Goal posts are painted with bright colours					
Bells are hanged on nets of goal post					
Adaptations made to the environment					
Rubber carpets are used during physical education activities					
Guided lines are used to prevent me from getting hurt and stepping out of the boundary					
The environment is free of noise during physical education activities.					
Guide ropes are used for demarcating the lanes for running events					
Adaptations to rules					
Rules are simplified during physical education activities					
The Number of players are reduced in most physical education activities for me					

The time of play is reduced in most physical education activities for me					

Challenges students face in physical education activities

Lack of motor skills development	**SA**	**A**	**N**	**D**	**SD**
I find it difficult to perform skills and activities that involve the use of hands					
I find it difficult to perform skills and activities that involve the my fingers					
I cannot walk during physical education activities					
I cannot run during physical education activities					
I cannot jump during physical education activities					
I find it difficult to balance during physical education activities					
Lack of self confidence					
I may not perform well during physical education activities					
I am afraid of getting hurt during physical education activities					
Lack of trained tutors					
Few available adapted physical education tutors					
Physical education teachers do not prepare adequately for physical education activities					
Lack of adapted environment					
The environment is not adapted during physical education activities					
Lanes for running events are not demarcated during physical education activities					
Lack of adapted materials					
Few balls with bells are available for physical education					
Bright coloured materials available during physical education activities are few					
Ball with embossed letters are not used during physical education activities					

Strategies teachers use to involve teachers in the physical education activities

Verbal description of instructions	**SA**	**A**	**N**	**D**	**SD**
Verbal instructions are used during physical education activities					
Directional words are used during physical education activities					
Landmarks are used during physical education activities					
Verbal descriptive feedback are used during physical education activities					

Verbal prompts are used during physical education activities					
Use of demonstrations					
Physical guidance is used during physical education activities.					
Teachers use tactile modeling during physical education activities					
I prefer physical guidance to tactile modeling during physical education activities					
Use of peer tutors					
Peer tutors to are used during physical education activities					
I perform better when I am taught by my peers					
I socialize with my sighted peers when they assist me in physical education activities					

Resources available for including student's physical education activities

Human resources available for physical education activities	**SA**	**A**	**N**	**D**	**SD**
Regular physical education teachers are available during physical education activities					
An adapted physical education teacher is available for physical education activities					
Orientation and mobility instructor are available during physical education activities					
Material resources available for physical education activities					
There are variety of balls during physical education activities					
There are enough balls for during physical education activities					
There is a playground where I do physical education activities					
Guide ropes are available for physical education activities					
Rubber carpets are available for physical education activities					