

**THE TEACHING OF MATHEMATICS TO STUDENTS WITH LOW VISION AT IGANGA
SECONDARY SCHOOL IN IGANGA DISTRICT IN UGANDA**

BY

BUGOHE PETER

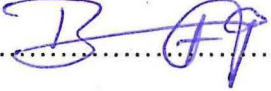
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**A DISSERTATION SUBMITTED TO KYAMBOGO UNIVERSITY GRADUATE SCHOOL IN
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DECLARATION

I **BUGOHE PETER**, hereby declare that this is my original work and has never been submitted to any other University or Institution of higher learning for any award.

Signed:.......... Date: 3rd Dec - 2018.....

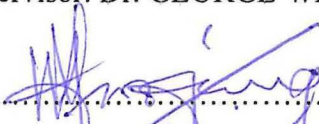
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APPROVAL

This is to certify that Mr. BUGOHE PETER has completed his Thesis under my supervision and is ready for submission with my approval to the graduate school of Kyambogo University.

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DEDICATION

This research work is dedicated to my family members most especially my wife Irene Bugohe, my children Nabwire Ruth, Nafula Courage, Erumbi Patience and Bugohe Emmanuel Prosper respectively. May the Almighty God bless you abundantly.

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ABSTRACT

The purpose of the study was to investigate “The Teaching of Mathematics to Students with Low Vision at Iganga Secondary School.” The objectives of the study included the strategies teachers use in teaching mathematics, challenges experienced by teachers in teaching mathematics and support provided to teachers by the school in teaching mathematics to students with low vision in secondary schools in Iganga District. The study was based on qualitative approach. The target population included Head teacher, Teachers and Students with Low Vision at Iganga Secondary School totaling to about 100. The sample of the study included 1 Head Teacher, 5 Teachers and 9 Students with Low vision. Purposive sampling techniques were used to determine participants. The instruments for data collection were semi-structured interviews. A pilot study was conducted to test the validity and reliability of the study instruments. The use of group work, use of summarized mathematics handouts, provision of extra time and observing proper sitting positions of students with low vision during instructional process were the major findings on objective one of the study. The fear of mathematics by students with low vision, negative attitudes towards students with low vision, lack of adapted teaching materials, failure to provide large print graph papers by UNEB and difficulty in teaching some topics in mathematics such as Construction, Bearing, Trigonometry and Further vectors, were the main findings on objective two. Involvement of external examiners, provision of teaching facilities, facilitation of teachers to attend external workshops and seminars on mathematics and sharing of ideas during mathematics club activities within the school were the major findings on objective three. According to the findings on objective one, the conclusion is that, there is need to explore more strategies suitable in the teaching of mathematics to students with low vision in secondary schools. The conclusion on objective two is that, there is need to train mathematics teachers in secondary schools on the problem solving skills in regard to managing students with low vision in order to overcome any possible challenge encountered. Basing on the findings on objective three, the support given to teachers by the school in the teaching of mathematics to students with low vision in secondary schools is inadequate. The general conclusion of the study focuses on the use of multi-disciplinary approach as fundamental in improving the teaching of mathematics to students with low vision in secondary schools. The recommendations of the study among others were as follow; Government should enact a policy to guide teachers in the teaching of mathematics to students with low vision in secondary schools, Secondary schools should ensure mandatory assessment of students with low vision to establish their actual learning needs as a basis for determining appropriate interventions, there is need to sensitize all stakeholders on reasonable accommodations for students with low vision in mathematics in secondary schools, Secondary schools should provide adequate support to teachers to enable them effectively teach mathematics to students with low vision.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter presents background of the study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study, delimitations, limitations, conceptual framework and the theory guiding the study.

1.1 Background of the study

The concept of low vision has no single definition agreed upon universally. Koenig (2000) defines the person with low vision as a person who has difficulty accomplishing visual tasks, even with prescribed corrective lenses. However, he notes that a person can enhance his or her ability to accomplish these tasks with the use of compensatory visual strategies, low vision and other devices, and environmental modifications. This definition encompasses a complex set of variables which provides a foundation for this study.

To teach mathematics to students with low vision therefore, requires a competent teacher to enable students benefit from the instructional process. Mathematics if well taught to students with low vision would provide the foundation to understanding the science field, develop their knowledge and skills in managing business and solving other problems in life related to application of mathematics concepts. To achieve all these benefits depends on the teacher's competence in teaching this subject. Teaching

competence refers to possession of required skills, knowledge, qualification or capacity to carry out teaching task successfully (Mason & McCall, 1997).

According to Mason et al (1997), the competencies required by mathematics teachers of students with low vision in secondary schools can be classified into two broad categories which include the demonstration of knowledge and understanding, and the demonstration of practical ability. They further assert that demonstration of knowledge and understanding would be assessed through teaching files and teaching practicum, written assignments, seminars and workshops. On the other hand, they noted that demonstration of practical ability would be assessed mainly through observation during teacher instruction and also through practical workshops on mathematics.

Mason et al also observed that mathematics teachers of students with low vision in secondary schools should be able to demonstrate a knowledge and understanding of the current national developments in mathematics curriculum and their implications for students with low vision. They also revealed that mathematics teachers of students with low vision should be able to demonstrate an ability to carry out an appropriate assessment of the educational needs of students with low vision.

The educational needs of students with low vision started to be recognized as different from those who were blind in the late 19th century. Many learners in London schools for the blind were discovered to have had sufficient vision to benefit from sighted methods of instruction. As a result, the first class for

learners with low vision was established in 1908 at an elementary school for sighted learners in the London borough of Camber well (Mason & Mccall, 1997).

Low vision services in the United States started as a result of an awakening that there is a middle ground between sight and blindness. The origins of these services were educational institutions for the blind like the Perkins school, which initiated its first class for “partially blind” learners in 1913. Although the term partially blind was already used to denote a state distinct from “blindness”, it was not until the conceptualization and use of the term low vision that the field of low vision started to gain momentum in educational institutions (Goodrich & Balley, 2000).

Generally, education is important to students with low vision in secondary schools. It leads to their fundamental transformation resulting into healthier lifestyle, ability to work across cultures, observing ethical values that help make the world more peaceful. It also enables them contribute to economic growth of the nation and adapting to newer techniques for productivity to attain independent living.

Diana (2004) noted that when working with students with low vision, it is important to remember that they have the potential to learn to use their residual vision in a more efficient way. This means that teachers are required to have relevant knowledge and skills to support them reach their maximum level of visual efficiency. Teachers need to learn to change the environment or alter objects to make them easier to see by the students with low vision.

When planning environmental modifications, considerations about lighting, contrasts, size, distance and organization of time and space have to be taken into account. This can help these students to learn mathematics easily among other subjects offered in secondary schools (Pimm, 2002).

The challenges of teaching mathematics to students with low vision are numerous even when students are capable. When students with low vision happen to be less capable in this subject area, then the challenges increase significantly and can become daunting (Royer, 2003).

Royer, further observed that as teachers face choices regarding how to help, organizing an effective improvement strategy can be difficult because so many factors affect student learning. It is therefore, vital for teachers to comprehensively understand the factors involved in improving mathematics instruction to students with low vision in secondary schools. They can then make better choices about which intervention to consider or how to supplement or customize a chosen intervention for their school settings.

To improve mathematics teaching to students with low vision in secondary schools, teachers should address a broad range of factors systematically, including an intensification strategy, coherent curriculum, effective pedagogy, deeper teacher mathematics knowledge, positive social factors and supportive organizational structures (Royer, 2003).

Mathematics being visual in nature, can present many difficulties to students with low vision. This implies that relevant teaching strategies have to be considered which may include but not limited to dynamic assessment for mathematics, explicit teacher modeling, instructional games, planned discovery activities, self-correcting materials, scaffolding instruction, structured co-operative learning groups and structured peer teaching (Royer, 2003).

A related study entitled teaching mathematics to students with visual impairment by Maguvhe (2015), which involved descriptive methods based on observation and semi-structured interviews and three participants, highlighted largely on strategies used for teaching students with blindness. The study findings put more emphasis on the use of tactile methods and therefore, less was brought out for students with low vision hence leaving a gap in the area of low vision in relation to the teaching of mathematics.

Similarly, in Iganga District, teachers in secondary schools seemed to have less competence in differentiating the teaching strategies for students with low vision and those with blindness hence finding great challenges during the teaching of mathematics to students with low vision in particular. To this effect, no authority was concerned with this appalling situation in secondary schools where students with low vision would not benefit from the instructional process. Many of these students would be left behind due to poor methods of teaching that teachers would use to teach them mathematics.

It is against this background that the researcher was compelled to conduct a study on the teaching of mathematics to students with low vision in secondary schools in Iganga District with the aim of establishing the appropriate intervention to address the gap.

1.2 Statement of the problem

Despite the availability of the teaching methods that teachers are expected to apply in the teaching of mathematics to students with low vision in secondary schools, in Iganga District, the students with low vision seemed to have developed mathematics phobia due to the teachers' limited competence in the teaching methodology of this subject. The evidence is based on the report of Visio project (2002) which revealed among others that teachers' schemes of work, lesson plans and classroom environment did not reflect appropriate methods for teaching mathematics to students with low vision in secondary schools. Visio is a Dutch based organization whose aim is to promote the education of students with low vision. In a related development, Ashcraft (2002) noted that mathematics phobia tends to make students feel negative towards mathematics as a subject in schools due to limited competency, exposure and poor practice by teachers leading to permanent mathematics anxiety among students.

1.3 Purpose of the study

The purpose of the study was to investigate the teaching of mathematics to students with low vision at Iganga secondary school.

1.4 Objectives of the study

The objectives of this study were to:

1. Analyze the strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District.
2. Find out the challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District.
3. Examine the support provided to teachers by the school in the teaching of mathematics to students with low vision in secondary schools in Iganga District.

1.5 Research questions

The study was guided by the following research questions:

1. What strategies do teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District?
2. What challenges do teachers experience in teaching mathematics to students with low vision in secondary schools in Iganga District?
3. What support is provided to teachers by the school in the teaching of mathematics to students with low vision in secondary schools in Iganga District?

1.6 Significance of the study

This study would empower teachers with relevant knowledge and skills in teaching mathematics to students with low vision through application of appropriate methods of instruction and educational resources which address the learning needs of these students. The study would suggest remedies to the challenges experienced by teachers in the teaching of mathematics to students with low vision in secondary schools. The study would also inform policy makers on how to improve the policies to promote effective teaching of mathematics to students with low vision in secondary schools. The study

would highlight the support provisions needed to enhance the effective teaching of mathematics to students with low vision in secondary schools. Finally, the study would act as the source of literature for future researchers undertaking studies in the field of low vision.

1.7 Delimitations

The delimitations of this study included:

- Working with a small sample size which promoted effectiveness in data collection and analysis.
- Using interviews for data collection which led to in-depth data collection to benefit the study.
- The appropriate selection of the school where the study took place enhanced the study findings.

1.8 Limitations

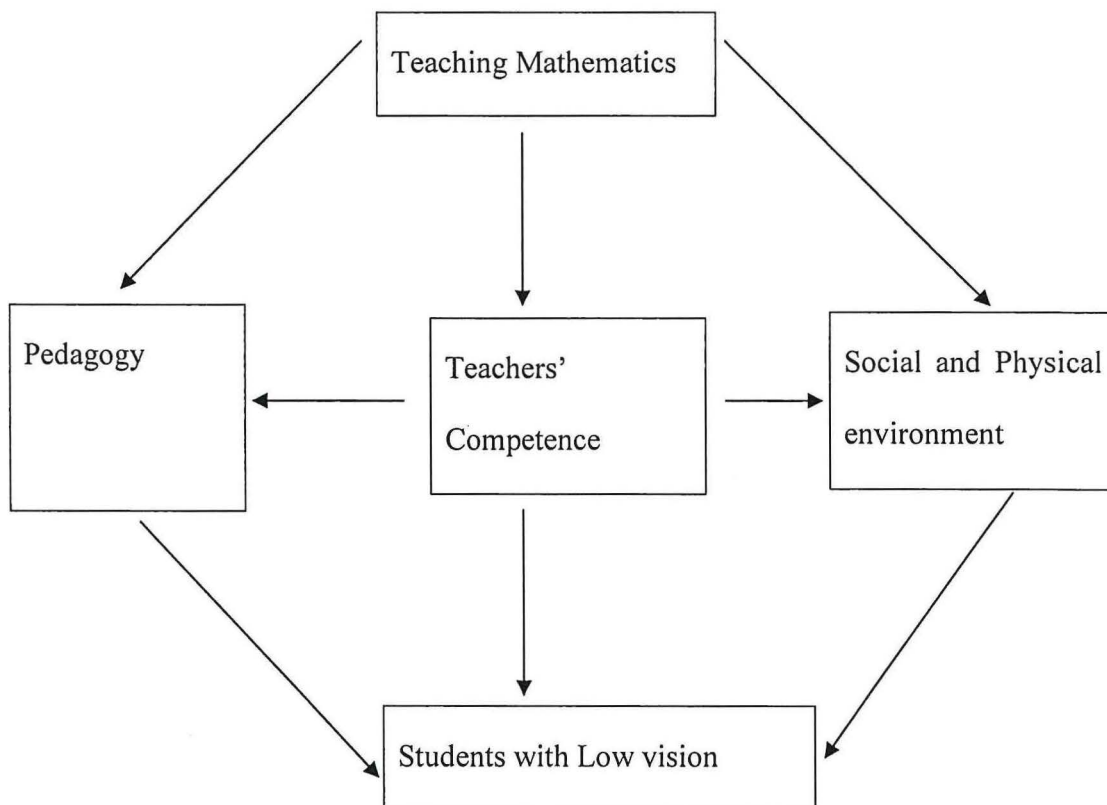
The study was restricted by the following shortcomings, conditions or influences:

- Limited prior research studies related to this study which led to difficulty in understanding of the research problem under investigation.
- Self-reported data from some respondents was biased due to selective memory, attribution and exaggeration.
- Limitation in time allowed for data collection by the sampled school authority compromised quality of the study findings to a small extent.

1.9 Conceptual Frame work

According to Maxwell (2009), a conceptual frame work is an analytical tool with different variations and contexts which are used to make conceptual distinctions as well as organizing ideas. This implies that assumptions, principles and rules are used to hold together the ideas comprising a broad concept. This conceptual frame work is based on the social model of disability.

The following is a Conceptual Frame Work illustrating how the variables considered relate to each other:



Independent variables	Dependent variables	Extraneous variables
<ul style="list-style-type: none"> • Teachers' competence • Pedagogy • Social and Physical Environment 	<ul style="list-style-type: none"> • Students with low vision 	<ul style="list-style-type: none"> • Time factor • Degree of low vision

Source: Adapted from a comprehensive frame work for improving mathematics in secondary schools by centre for Technology in learning, SRI international (2016).

Following the conceptual frame work provided, teaching mathematics reflects how students with low vision are influenced by teachers' competence to learn mathematics in secondary schools.

Social and physical environment here refers to factors such as the attitude of teachers, peers and parents towards students with low vision and support structures, equipment and facilities provided for teaching mathematics in secondary schools. Positive attitude and adequate support provisions result into effective teaching of mathematics to students with low vision in secondary schools. Pedagogy means organization and delivery of mathematics learning experiences to students with low vision. Effective instructional strategies lead to effective teaching of mathematics to students with low vision in secondary schools.

Teachers' competence encompasses teacher's awareness of students with low vision, capabilities, as well as their knowledge and skills of teaching mathematics to students with low vision.

1.10 Vygotsky's theory of Social Cultural Cognitive Development

This study was guided by Vygotsky's theory of Social Cultural Cognitive Development (1978). Vygotsky's main assertion was that students are entrenched in different socio cultural contexts and their cognitive development is advanced through social interaction with more knowledgeable and skilled individuals. Believing that students construct knowledge actively, Vygotsky's theory is also one of those theories responsible for laying the ground work for constructivism. Vygotsky is most recognized for his concept of zone of proximal development pertaining to the learning process.

According to Vygotsky, students learn when they are in their zone of proximal development. This theory states that there are three zones of proximal development. One zone contains information the student has already mastered and is capable of doing on his or her own. A second zone is for information the student can understand with assistance or prompting from the teacher. The third and final zone contains information outside the student's current level of understanding, even with assistance.

Vygotsky called the second zone, where student can understand information with assistance, the student's zone of proximal development. It is within this zone that learning takes place, and the goal is to push the zone forward thus moving information from what the student can understand with assistance

into the zone of mastery. Students who are in this zone for a specific task can almost perform the task independently, but not quite there yet. However, with an appropriate amount of assistance from the teacher, these students can accomplish the task successfully. This implies that students with low vision in secondary schools can do better in mathematics if given the necessary support by their teachers.

In conclusion, Vygotsky's theory, affirms that any person who possesses a higher knowledge and skill level than the student with regard to a particular task is called a more knowledgeable other (MKO). Therefore, this person may be a teacher, parent, any responsible adult or even a peer.

Having presented the background of the study, the next chapter focuses on the review of the related literature:

1.11 Definition of Terms

Students with low vision: Learners at secondary level with significant reduction in visual function.

Teachers: Persons who teach in schools.

Competence: The ability to do something efficiently.

Strategy: A plan of action designed to achieve an aim, goal or objective.

Mathematics: The science of number, quantity and space as abstract concepts

Adaptation: Adjustments or changes made on the curriculum and school environment.

Counseling: The provision of professional assistance in resolving personal or psychological problems.

Optical devices: All devices involving use of lenses for magnification.

Non-Optical devices: All devices which do not involve the use of lenses for magnification.

Social environment: A part of surrounding developed by humans characterized by their influences on each other.

Physical environment: A Part of surrounding which includes infrastructure, materials, equipment and all other different factors of nature.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

The previous chapter gives insight into the background information to the study. In this chapter the main focus is on the presentation of the review of related literature in accordance to the research objectives as stated:

- The strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District.
- The challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District.
- The support provided to teachers by the school in the teaching of mathematics to students with low vision in secondary schools in Iganga District.

2.2 The strategies teachers use in teaching mathematics to students with low vision in secondary schools

The following is a review of the related literature regarding the strategies teachers use in teaching mathematics to students with low vision in secondary schools:

Holbrook (2000) asserts that the knowledge of the mathematics content to be taught is a cornerstone of teaching for proficiency. He further noted that improving teachers' mathematical knowledge and their capacity to use it to do the work of teaching is crucial in developing students' mathematical proficiency.

Therefore, teachers need to know mathematics in ways that enable them to help students with low vision learn more effectively.

In a related development, Geary (2012) observed that the social constructivist perspective provides insight into how environmental demands can shape the development of mathematical symbol systems and the strategies that emerge out of these systems. This perspective on strategy use provides insight into the tremendous variation in mathematics in relation to context and culture. This implies that mathematics teachers need to carefully understand the culture and context in which mathematics is to be presented to students with low vision in secondary schools.

Koenig (2000) noted that one of the principle concerns for students with low vision in learning mathematics is their ability to access the visual environment. He therefore, argued teachers to use teaching strategies that enhance accessibility to the visual environment such as the application of optical devices. He further noted that optical devices include Hand held and stand magnifiers, microscopes, telemicroscopes, monocular telescopes and Bioptic lenses. Teachers should however assess their students with low vision to determine the particular optical device that suits particular students with low vision depending on their individual differences. This would enable them to use these optical devices with maximum comfort.

On the other hand, Bishop (2002), states that mathematics large print books and papers can be created for a teacher to easily instruct students with low vision since enlarged materials increase their visual efficiency during teaching and learning process. In a related development, Smith (2002) cites specialized mathematics instruments with larger numbers or inventive ways of using existing materials as possible teaching strategy to overcome barriers to teaching mathematics to students with low vision in secondary schools. However, it is important to note that low vision affects students differently and as such, different students with low vision may require different font sizes to suit their learning needs.

According to D'Andrea (2000), teachers are encouraged to use the strategy of presenting mathematics materials on audiotapes to enable students with low vision reflect the instructional process together with their peers. This strategy allows students with low vision to benefit from their sense of hearing as an alternative to sense of sight. It also saves them from the burden of straining to write all the time.

Closely related to D'Andrea, is Cowan (2005), who argues teachers to train their students with low vision to use computers in down loading mathematics texts from publishers directly. He also noted that texts on computers can be presented through speech, large print or braille depending on the software and hardware available hence giving students a wide range of opportunities to have access to mathematics content. In these modern times, technology has simplified life of many individuals including those with low vision.

Shepler (2005), emphasized on teachers using mathematics handouts containing pertinent information with the view that they can be more easily accessed by the students with low vision during and after classroom interactions. This means that mathematics teachers need to endeavor to make meaningful summaries for students with low vision to easily grasp mathematics concepts on the different topics covered in the subsequent lessons. This would support these students to have focus on key areas reflected in the hand outs as a basis for understanding mathematics comprehensively.

The use of groups to complete assignments is also useful for providing a support in mathematics to students with low vision (Farrenkopf, 2000). This means that when teachers group learners to work out mathematics tasks, then students with low vision benefit from peer discussions hence mastery of mathematics concepts. This practice also provides opportunity to students with low vision to explore their potentials as they interact with their peers in relation to the mathematics subject matter.

O'Donnell (2002) encourages students with low vision to indicate when they are having difficulty in accessing information, completing a task, or understanding a process or skill as another strategy teachers use for enabling students with low vision study mathematics more effectively. This strategy eventually leads to increased confidence among these students which enables them to express their minds through asking teachers to clarify where need be during the instructional process. As a result they learn to share and urge out mathematics facts and ideas hence increased mastery of mathematics concepts.

Involvement of other stakeholders as highlighted by Royer (2003) is a vital strategy as it allows sharing of ideas between teachers and different professionals as well as parents on how best students with low vision can cope with learning mathematics in secondary schools through establishing the possible support they require. Some students to cope with the learning of mathematics in secondary schools may need medical intervention from medical personnel to address their specific health problems that otherwise would obstruct their academic progress. Others may need parental intervention such as parental love, provision of basic needs including scholastic materials as well as parental guidance.

Guidance and counseling is another strategy teachers use in teaching mathematics to students with low vision in secondary schools (Holbrook, 2000). Through guidance and counseling, students with low vision regain hope and get motivated to learn mathematics without suffering from anxiety. Therefore, teachers should enhance their guidance and counseling knowledge and skills to appropriately apply it as psychotherapy thus a psychological method based on regular interaction with students with low vision hence a treatment of mathematics phobia and anxiety.

Alexander (2003), points out seating positions of individual learners with low vision during teaching and learning process. He observes that students with low vision need proper seating positions that permit them to utilize their residual vision more effectively. This means that students with low vision need particular locations in class depending on the degree of their low vision. some may require positions with bright light while others may need less light most especially those who are photophobic. Besides

light, some students with low vision may have their visual acuity in the peripheral vision which may compel them to sit strategically in order to view the chalkboard from the periphery.

Provision of extra time is also said to be a strategy in teaching mathematics to students with low vision in secondary schools (Diana, 2004). It implies that some mathematical assignments are complex to solve and therefore, students with low vision may require additional time to think at ease to accomplish them. Besides, some students with low vision may be slow learners and as such may require extra time to accomplish their tasks in mathematics more effectively. Teachers should therefore, understand that individual students with low vision are affected differently but capable of accomplishing same tasks at different times depending on the degree of low vision.

Knight (2002) cites collaborative instructional strategy as a means of effective teaching of mathematics to students with low vision. He adds that to be most effective teacher, training should include theory, demonstration, practice, feedback, and classroom application. In this case, mathematics teachers should be exemplary in that they should apply the theory of mathematics into actual practice to demonstrate their ability in teaching the subject to students with low vision. Teachers should also be mindful of their feed back to students with low vision. The language teachers use should promote good teacher-student relationship to attract attention of students with low vision to teaching and learning process of mathematics.

A case study conducted in USA by Osterhaus (2003), on strategies in teaching mathematics to students with visual impairment which involved descriptive research method and one participant purposively sampled, revealed that the use of technology could be a vital instructional strategy for teaching mathematics to students with low vision in secondary schools. The study further recommended the use of Non-optical low vision devices as additional strategies in the teaching of mathematics to students with low vision. In conformity with this study, Cowan (2005) argues teachers to train their students with low vision to use computers in down loading mathematics texts from publishers directly. He further noted that texts on computers can be presented through speech, large print or Braille depending on the software and hardware available thereby giving students a wide range of opportunities to have access to mathematics content.

Closely related to the study above is Bishop (2002) who asserts that mathematics large print books and papers can be created for a teacher to easily instruct students with low vision since enlarged materials increase their visual efficiency during teaching and learning process. Similarly, Smith (2002) cites specialized mathematics instruments with larger numbers or inventive ways of using existing materials as possible teaching strategy to overcome barriers to teaching mathematics to students with low vision in secondary schools

In line with the same study, D'Andrea (2000) also urges teachers to use the strategy of presenting mathematics materials on audiotapes to enable students with low vision reflect on the instructional process together with their peers during their revision activities.

Generally, the study by Osterhaus (2003), on strategies in teaching mathematics to students with visual impairment has a greater link in that it reflects the opinions of various authors in regard to the strategies used by teachers in teaching mathematics to students with low vision in secondary schools.

Ocloo (2003) observes the need for teachers to use task analysis as a reliable strategy in teaching mathematics to students with low vision in secondary schools. This strategy not only caters for students' needs in regard to low vision but also addresses other needs of students with low vision related to slow cognitive processes since the teaching plan considers presentation of specific content at a time which simplifies understanding hence motivating students to develop interest and a positive thinking about mathematics as a subject which is not difficult to learn.

On the other hand, Brooklen (2000) urges teachers to train their students with low vision self-monitoring skills as a strategy geared towards improving the teaching and learning process of mathematics. This strategy generally helps students with low vision to learn how to manage their own work through self-monitoring and evaluation. As a result, these students learn how to appreciate their efforts and weaknesses in mathematics which awakens them to take appropriate steps in solving the problems they encounter in this subject area.

The use of clear and simple language of instruction is said to be one of the many strategies teachers use in teaching mathematics to students with low vision in secondary schools (Ainscozo, 2004). This implies that teachers need to use appropriate language in classroom when teaching mathematics to students with low vision as a strategy to enable them easily understand the explanations during the instructional process. Using difficult language during instruction would therefore, mean setting aside students with low vision during the teaching of mathematics in secondary schools.

According to Koenig (2000), the use of peer-to-peer support is a reliable strategy teachers use in the teaching of mathematics to students with low vision in secondary schools. This means that teachers can identify some capable students in class to be trained to work as their co-teachers in teaching mathematics to students with low vision in secondary schools. This strategy is possible because most students understand easily their fellows than teachers probably due to the fact that they use common language familiar to them.

Conclusively, effective teaching of mathematics to students with low vision depends on effective implementation of the recommendations reached following assessment results because every student or particular group of students with low vision may require particular intervention strategy which suits individual learning needs which may vary due to differences in the age of onset.

2.3 The challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools

The literature review on the challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools is as presented:

According to Post (2000) the development of mathematics competence rests fundamentally on the development of cognitive structures that permit a student to interpret the world of quantity and number in increasing sophisticated ways, to acquire new knowledge in this domain. He further noted that a larger proportion of teachers are unable, not only to solve the mathematical problems posed, but even to make sense of the questions hence a challenge in the teaching of mathematics to students with low vision. This leaves a lot to be desired for investigation right from the training process of teachers to establish whether or not the training institutions are to blame or teachers themselves.

Royer (2003) affirms that teachers find challenges in integration of knowledge network to connect the world of real quantities, world of counting numbers and world of formal symbols. This implies that mathematics requires a teacher to acquire competence on the construction of a rich set of relationships among these worlds in order to meet the needs of students with low vision in secondary schools.

In a similar development, Gardner (2002) states that mathematics teachers tend to experience challenges in differentiating instructional strategies to cater for individual differences during class instructions. He further observed that this, not only affects students' perception of the subject but also brings questions on the teacher's competence in teaching the subject.

Ashcraft (2002) noted that mathematics phobia tends to make students feel negative towards math subject in schools which gives challenges to teachers during teaching and learning process. Similarly,

students with low vision may turn to be a challenge to teachers if their attitude towards mathematics is negative. He further added that this experience makes teachers to develop negative attitudes towards their students with low vision.

According to Stipek (2003) teachers are faced with a challenge of limited mathematics large text materials which would aid in the teaching of students with low vision. This means that the available mathematics text materials do not suit the numbers and needs of students with low vision hence making instructional process difficult.

Alexander (2003) observed that many students with low vision lack scholastic materials adapted to their needs in mathematics which affects the teaching and learning process of mathematics subject in secondary schools. This implies that teachers experience hard times to teach students who lack the basic scholastic materials for studying mathematics.

Dickinson (2008) noted that schools with limited facilities affect teachers' work during teaching and learning process. He added that some practical subjects such as mathematics require enough space to enable a teacher organize and manage the class easily with maximum comfort in the seating arrangement which allows free movement and group discussions. Ideally, adequate spaces in classrooms provide students with opportunity to interact freely which enables them to support one another in regard to the mathematics assignments given. Students with low vision need adequate space to utilize their

remaining vision more effectively. If classrooms are congested with no space to allow free movements, it does not only affect students with low vision but also makes teacher's work difficult.

Keefe (2004) highlights one of the challenges teachers face in schools as being poor lighting system in classrooms and resource rooms. He further noted that in such schools, assessment of students with low vision becomes difficult and that if any, the results may not be consistent leading to misguided interventions in the teaching process. This implies that students with low vision cannot effectively use their residual vision in dark environment. Therefore, schools need to enhance the residual vision of these students through provision of adequate lighting system in classrooms and their resource rooms to enable teachers perform their roles more efficiently.

According to Poel (2007) shortage of reference books in schools is cited as one of the challenges teachers encounter in their day to day work. This implies that due to shortage of mathematics reference books, teachers tend to find a challenge in preparing quality schemes and lesson plans for students with low vision in secondary schools. Effective teacher preparation depends on the availability of the current references which provide opportunity for comparison of the subject matter and possible methods used in delivery during the instructional process. Secondary schools therefore, need to equip the libraries with variety of mathematics reference materials to enable teachers plan effectively for students with low vision.

Ball (2005) cites a study carried out in UK on the challenges faced by mathematics teachers from the International Comparative literature which involved the use of observational and interview methods and four participants. This study highlights Pedagogical differences arising from rigid teacher training curriculum, lack of teacher motivation and mentorship in mathematics as major challenges teachers experience in the teaching of mathematics to students with low vision in secondary schools. This means that inadequate training of teachers affects their knowledge and expectations in the teaching of mathematics to students with low vision.

In relation to the study above, Royer (2003) affirms that teachers find challenges in integration of knowledge network to connect the world of real quantities, world of counting numbers and world of formal symbols. This implies that mathematics requires a teacher to acquire competence on the construction of a rich set of relationships among these worlds. However, this desire had been constrained due to inadequate teacher training as the study revealed.

In a similar development, Gardner (2002) states that mathematics teachers tend to experience challenges in differentiating instructional strategies to cater for individual differences during class instructions. He further observed that this not only affects students' perception of the subject but also brings questions on the teacher's competence in teaching the subject.

In line with the same study, Post (2000) asserts that the development of mathematics competence rests fundamentally on the development of cognitive structures that permit a student to interpret the world of quantity and number in increasing sophisticated ways to acquire new knowledge in this domain. He further, noted that a larger proportion of teachers are unable, not only to solve the mathematical problems posed, but even to make sense of the questions hence a challenge in the teaching of mathematics to students with low vision. Therefore, the teacher training institutions have an obligation to improve on the standard of teacher training most especially in the field of mathematics in order to guarantee quality assurance in the teaching of mathematics to students with low vision in secondary schools.

Waldron (2006) states that high enrolment in classrooms is a serious challenge to teachers most especially those dealing with practical subjects such as mathematics among others. This is true because practical based subjects require appropriate teacher- student ratio to provide opportunity for every student to be supported adequately by the teacher during the teaching and learning process. Therefore, when the class is overwhelmed with high enrolment, then the teacher's efficiency in teaching is tremendously affected. In this case, the teaching of mathematics to students with low vision becomes difficult since this group of students require some times individualized support from the teacher. This individualized support cannot be implemented in a highly congested classroom.

In another development, Oppong (2003) asserts that most teachers are constrained with a number of personal and external forces arising from social- cultural background for example; domestic violence,

alcoholism to mention but a few. This implies that when a teacher is affected by such environmental circumstances, suffers greatly from psychological torture which in turn affects his concentration regarding his or her primary role of planning for effective teaching of mathematics to students with low vision in secondary schools hence a challenge which needs mitigation to allow steady progress in the teaching of mathematics to students with low vision.

In support of the above argument, Alexander (2003) points out that many teachers do not perform their roles to their maximum due to interferences from their immediate surroundings which hinder them from effective teaching of mathematics to students with low vision in secondary schools. He further indicates that these may be either artificial or natural factors from the environment. It is therefore important to set a conducive teaching and learning environment for both teachers and students with low vision in order to achieve positive results in the teaching of mathematics to students with low vision in secondary schools.

Another related challenge teachers experience in the teaching of mathematics to students with low vision in secondary schools is poor teacher- parent relationship caused by high expectations from parents and lack of co-operation (Kaufman, 2007). This means that poor working relationship between teachers and parents of students with low vision in secondary schools affects the process of teaching mathematics to these students. This could be due to pressure on teachers by the parents or generally lack of co-operation between the teachers and the parents. This may happen most especially when parents do not want to turn up for academic meetings at class or school level. Such tendencies leave teachers with many questions

unanswered and as a result they may choose to relax hence a challenge in teaching mathematics to students with low vision in secondary schools.

Conclusively, though the above challenges may appear as a threat to the teaching of mathematics to students with low vision in secondary schools, teachers are still encouraged to use them as learning tools to determine a better destiny for these students in regard to the teaching of mathematics.

2.4 The support provided to teachers by the school in the teaching of mathematics to students with low vision in secondary schools

The literature review on the support provided to teachers in the teaching of mathematics to students with low vision in secondary schools is as indicated:

Alec (2006) asserts that the school system should be mindful of supporting teachers to meet the ever increasing demands in the teaching and learning of mathematics. He further noted that teachers ought to be facilitated to attend workshops, seminars and conferences on the current trends in mathematics. Such arrangements help to improve classroom practices in this subject area.

The idea of teacher support group within the school setting would also help to empower teachers with relevant mathematics skills (Beverly, 2006). This implies that teacher support groups are a great way to

enable mathematics teachers grow professionally since members provide each other with various types of help in the areas of difficulties.

Ndurumo (1998) cited the need for schools to support teachers with the necessary resources such as modern library services, accommodation facilities, and reasonable remuneration to help them concentrate on working to achieve their primary goal in schools. Therefore, when teachers are supported adequately, their level of striving to meet individual needs of learners increases.

Duncan (2003) observed provision of specialist mathematics support to teachers instills direct mathematics knowledge and skills that can promote confidence to teachers when teaching students. This means teachers in secondary schools need special support from experts to increase on their abilities in teaching mathematics to students with low vision in secondary schools.

Schools have the obligation to provide teachers with prep books, pens and other chalkboard materials deemed necessary in the teaching of mathematics to students with low vision in secondary schools (Linden, 2009). This implies that when teachers are supported, then they get motivated to execute their roles more effectively in schools. The efficiency of a teacher is determined by the degree of support provided to him or her in the process of planning and implementation of the instructional process.

Keefe (2004) noted that schools in collaboration with parents should provide teachers with adequate optical devices like stand and hand held magnifiers including classroom telescopes to aid in enhancing the functional vision of students with low vision. This not only supports teachers to teach but also motivates students to learn mathematics and other subjects with high interest and ease. These optical devices help students with low vision in increasing accessibility to information during and after the instructional process hence enabling the teacher to achieve his or her objectives of teaching mathematics to students with low vision in secondary schools.

Koenig (2000) observed that schools should consider provision of special rooms (private setting) for teachers to offer guidance and counseling services to students with low vision. This implies that when schools provide space within its facilities, then teachers can ably address students' anxiety related to learning of mathematics and other academic subjects in a free and friendly environment through guidance and counseling. Guidance and counseling is very important in supporting both teachers and students resolve their personal and imposed conflicts within themselves and therefore, serves as a psychological therapy which heals psychological torture that would otherwise affect the teaching and learning of mathematics in secondary schools.

Improvement on quality of chalkboard using sustainable paint is a primary role of school administration aimed at supporting teachers of students with low vision in ensuring clear and bold writing during the mathematics teaching and learning process (D'Andrea, 2000). This therefore, means that teachers can observe standards required in producing large print on classroom chalkboards to cater for the needs of

students with low vision if the school is supportive in terms of observing regular quality repairs on such teaching facilities.

Heward (2000) noted that teachers can play a significant role in teaching mathematics to students with low vision when the school plans to address classroom physical gaps such as lighting system and space to allow classroom structuring for easy location of educational materials and equipment. Students with low vision need a conducive learning environment which support teachers in using Non-optical devices which include but not limited to light, distance, contrast, size and position.

According to the case study conducted in USA by Centre for Technology in learning, SRI International (2016), which involved descriptive correlational method with three participants, revealed that organizational structure and social climate of the school can have a profound effect on teachers' performance in teaching mathematics to students. This implies that teachers need social motivation from and outside the school to effectively teach mathematics to students with low vision in secondary schools.

In line with the above study, Alec (2006) also asserts that the school system should be mindful of supporting teachers to meet the ever increasing demands in the teaching of mathematics. He further noted that teachers ought to be facilitated to attend workshops, seminars and conferences on the current trends in mathematics. Such arrangements help to improve classroom practices in this subject area.

In a related development, Beverly (2006) advances the idea of teacher support group within the school setting which he says could help to empower teachers with relevant mathematics knowledge and skills. This implies that teacher support groups are a great way to enable mathematics teachers grow professionally since members provide each other with various types of support in the areas of difficulties. Similarly, Ndurumo (1998) advocates for the need to support teachers with the necessary resources such as well equipped library services, accommodation facilities, and reasonable remuneration to motivate them to work hard to achieve their main goal in schools. This means that, when teachers are supported effectively, they increase in their level of striving to meet individual needs of learners during instruction process.

Dawn (2000) advocates for the provision of support supervision to teachers to improve their performance in teaching mathematics to students with low vision in secondary schools. However, this requires a technical team with rich experiences on how to teach mathematics to students with low vision in order to effectively guide and support teachers in implementing their roles with regard to teaching mathematics to students with low vision in secondary schools.

Generally, teachers need adequate support to effectively teach mathematics to students with low vision in secondary schools. Short of the necessary support would mean doing a disservice to these students. In this respect, all stakeholders need to play their roles effectively in order to improve on the teaching of mathematics to students with low vision in secondary schools.

Having reviewed the related literature to the study, the following chapter highlights the methodology used to carry out this study.

CAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter is crucial in that it addresses the practical aspects of the study. The chapter focuses on the research approach, scope of the study, target population, sample, method of sampling, methods for data collection, procedure for data collection, data analysis and ethical considerations.

3.2 Research approach

Creswell (2003) defines research approach as the overall plan that comprises detailed outline of how an investigation will take place. In this study, qualitative approach was used. Burns and Grove (2003) describe a Qualitative research approach as a systematic subjective approach used to describe life experiences and situations to generate their meaning. This typically includes how data would be collected, what instruments to be employed, how the instruments would be used and the intended means for analysis of data collected. Constructivism paradigm was used in this research approach. This is a research paradigm in which knowledge is socially constructed by participants actively involved in the research process (Creswell, 2003). In light of this paradigm, Creswell asserts that researchers should seek to understand the complex world of lived experience from the point of view of those who lived it. This is a broad methodological approach that examines the 'why' and 'how' of the decision making regarding the research problem through in-depth study from the field work (Bryman, 2004).

3.3 Scope of the study

The study was conducted in Iganga secondary school in Iganga District. This school was considered for this case study because it had a unit for students with low vision. Iganga District is found in the eastern part of Uganda. The study was limited to the teaching of mathematics to students with low vision at Iganga secondary school. This study was conducted from August, 2017 to October, 2018.

3.4 Target Population

The research Population is generally a large collection of individuals or objects perceived to be the main focus of the scientific query (Dewalt, 2002). The population for this study included the Head teacher, teachers and students with low vision in Iganga secondary school making a total population of about 100.

3.5 Sample

According to Holstein (2000), a sample is a proportion of the target population used for generalization of findings. The sample for this study included one (1) Head teacher, five (5) teachers and nine (9) students with low vision in Iganga secondary school totaling to fifteen (15) participants.

Table 1: Summary of the sample

School:	Iganga Secondary School
Head Teacher	01
Teachers	05
Students with Low Vision	09
Total	15

3.6 Reasons for choice of this category of sample

The head teacher was involved in this study because administrative position has influence on budgetary process of the school, motivation of both teachers and students with low vision and general supervision of teaching and learning process of mathematics among other subjects offered in secondary schools.

The teachers were considered as participants in this study because they are responsible for curriculum implementation and therefore, directly influence students with low vision through the teaching and learning process of mathematics in secondary schools.

Students with low vision were selected to participate in the study because they are the beneficiaries of the instructional process and had experiences on how teachers would impact on them during the teaching and learning process of mathematics in secondary schools.

3.7 Method of Sampling

Dewalt (2002) defines sampling as a process of determining a representative group of participants to be used for investigating a whole population. For this study, the researcher used purposive sampling technique because the participants to provide relevant information were well known to have experiences related to the research problem. To select head teacher, teachers and students with low vision, the researcher used typical case, critical case and homogeneous purposive sampling techniques respectively to determine reliable participants for the study.

3.8 Methods for data collection

Data collection is an important aspect of any type of research study. The method for data collection for this study was through interviews. According to Webster (2017), interviews imply a procedure designed or conversation where questions are asked and answers are given in order for the interviewer to determine relevant information to inform a study. The researcher used semi-structured interview guides to collect data from the participants who were identified to participate in the study. The participants' responses were tape recorded during the process of data collection while other responses were recorded using a note book.

3.9 Reasons for choice of semi-structured interviews

The researcher chose to use semi-structured interviews because of the following reasons:

They enabled the researcher to prompt and probe deeper into the given situations. They also allowed the participants to be asked the same questions within a flexible frame work. They made possible discussions to diverge from the interview guide to include other important issues discovered.

Semi-structured interviews allowed questions to be prepared in advance which enabled the researcher to be prepared and therefore, appeared competent during the interview process. They further enabled respondents the freedom to express their views in their own words.

3.10 Procedure for data collection

The researcher adhered to the following procedure for data collection:

An introductory letter from the Head of Department Special Needs Studies was obtained. The researcher also prepared a self-introductory letter to accompany the study instruments. The researcher conducted a pilot study by selecting purposively a few respondents from Busia District to test the validity and reliability of the study instruments upon approval by the research supervisor. The researcher then made arrangements with the participants regarding the dates for data collection using refined study tools. The researcher finally proceeded to the field for data collection as agreed with the participants.

3.11 Methods of Data Analysis

This is a process of inspecting, cleaning, transforming and modeling data with the aim of highlighting useful information, suggesting conclusions and supporting decision making (Denzin, 2011). Typology method of data analysis was used. This means that analysis of data for the study was based on the three formulated research questions. Data was presented in thematic sections that aroused from the responses of the participants. This involved identification of main themes and sub-themes which were classified into categories, where similar responses were grouped together. The responses which were not similar were grouped separately. The findings of the study were then presented with the help of tables showing responses and their frequencies.

3.12 Ethical considerations

Ethics in research refer to norms acceptable for conduct of research (Creswell, 2003). In this study, all Participants, Participated voluntarily. This means that the researcher would give the participants freedom to choose whether or not to participate in this study.

Confidentiality of the data collected and respect for all the participants' rights was observed. This means that the real names of the participants would not be mentioned in the study but rather, the researcher used codes to represent categories of participants who were involved in the study.

Finally, the researcher considered the aspect of working under the guidance of the research supervisors.

In the next chapter, the focus is on the data presentation and analysis of findings of the study.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS OF FINDINGS

4.1 Introduction

The data was presented using tables showing responses and their frequencies. The analysis was based on the three research objectives which included:

- The strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District.
- The challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District.
- The support provided to teachers by the school in the teaching of mathematics to students with low vision in secondary schools in Iganga District.

4.2 The strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District

Objective one sought to analyze the strategies teachers use in the teaching of mathematics to students with low vision in secondary schools in Iganga District. The data presentation for objective one is as shown on table 2:

Table 2: Strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District

Responses	Frequencies			
	Ht	Trs	Swlv	Total
Use of large print	-	2	3	05
Use of group work	1	5	4	10
Use of optical devices	1	2	3	06
Use of resource persons	1	3	4	08
Use of summarized mathematics handouts	-	5	7	12
Provision of extra time to students	1	5	9	15
Observing proper sitting position	1	5	9	15
Use of task analysis	-	2	5	07
Training self-monitoring skills	-	2	2	04
Use of clear and simple language	1	3	5	09
Use of peer-to-peer	1	1	1	03

Key

Ht- Headteacher

Trs- Teachers

Swlv- Students with low vision

Table 2 shows data on the strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District. Basing on the data presented on this table, 15 respondents mentioned provision of extra time to students with low vision, other 15 respondents emphasized on proper sitting positions of students with low vision during instructional process, 12 of the respondents said teachers use summarized mathematics handouts, 10 respondents mentioned use of group work, 09 respondents mentioned use of clear and simple language, 08 respondents revealed that teachers use resource persons, 07 respondents noted that teachers use task analysis, 06 respondents stated use of optical devices, 05 respondents said teachers use large print in teaching mathematics to students with low vision, 04 respondents observed training students with low vision self-monitoring skills, and only 03 respondents identified the use of peer-to-peer strategy in teaching mathematics to students with low vision.

The results therefore, reveal that use of group work, use of summarized mathematics handouts, provision of extra time to students with low vision and observing proper seating positions of students with low vision during instructional process were the major strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District.

According to the findings on objective one, there is need to explore more strategies suitable in the teaching of mathematics to students with low vision in secondary schools.

The next presentation and analysis of data is on the challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District.

4.3 The challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District

Objective two sought to find out the challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District. The data was presented as indicated on table 3:

Table 3: The challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District

Responses	Frequencies			
	Ht	Trs	Swlv	Total
Fear of mathematics	1	4	7	12
Negative attitude	1	5	9	15
Lack of adapted teaching materials	-	5	8	13
Poor lighting in classrooms	-	4	6	10
Limited instructional materials	1	3	7	11
UNEB failing to provide large print graph papers	1	5	6	12
Limited knowledge on general methodology	1	3	5	09
Difficulty in teaching some topics in mathematics	1	5	9	15
High enrolment	1	3	3	07
Limited motivation	-	3	3	06
High expectation from parents	1	5	2	08

Key

Ht- Headteacher

Trs- Teachers

Swlv- Students with low vision

Table 3 indicates data on the challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District. According to the data presented, 15 respondents reported negative attitudes towards students with low vision, other 15 respondents noted that teachers find difficulty in teaching some topics in mathematics such as Construction, Bearing, Trigonometry and Further vectors, 13 of the respondents mentioned lack of adapted teaching materials as a potential challenge, 12 respondents stated that teachers experience a challenge of fear of mathematics by students with low vision, 12 other respondents pointed out UNEB failing to provide large print graph papers to students with low vision during national exams, 10 respondents said that teachers face a challenge of poor lighting in classrooms, 11 respondents identified limited instructional materials, , 09 respondents mentioned limited knowledge on the general methodology of teaching mathematics to students with low vision, 08 of the respondents mentioned high expectations from the parents, 07 respondents identified high enrolment and only 06 respondents observed limited motivation from the school as being a challenge,

The results on objective two reveal that fear of mathematics by students with low vision, negative attitudes towards students with low vision, lack of adapted teaching materials, UNEB failing to provide large print graph papers to students with low vision and difficulty in teaching some topics in mathematics such as Construction, Bearing, Trigonometry and Further vectors, were the main challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District.

Conclusively, there is need to train mathematics teachers in secondary schools on the problem solving skills in regard to managing students with low vision in order to overcome any possible challenge encountered.

Having presented and analyzed data on objective two, the next focus is on the presentation and analysis of data in regard to the support provided to teachers by the school in the teaching of mathematics to students with low vision in secondary schools in Iganga District.

4.4 The support provided to teachers in the teaching of mathematics to students with low vision in secondary schools in Iganga District

Objective three sought to examine the support provided to teachers in the teaching of mathematics to students with low vision in secondary schools in Iganga District. The presentation of data for objective three is as shown on table 4:

Table 4: The support provided to teachers in the teaching of mathematics to students with low vision in secondary schools in Iganga District

Responses	Frequencies			Total
	Ht	Trs	Swlv	
Provision of some instructional materials to teachers	1	3	5	09
Involvement of external examiners	1	5	9	15
Provision of some optical devices	1	1	02
Provision of teaching facilities	1	4	8	13
Facilitating teachers to attend external workshops and seminars	1	5	5	11
Organizing internal workshops and seminars	1	1	2	04
Sharing of ideas during mathematics club activities	1	5	8	14
Involvement of other organizations	1	3	5	09

Key: Ht- Head teacher

Trs-Teachers

Swlv- Students with low vision

Table 4 shows data presented in regard to the support provided to teachers in the teaching of mathematics to students with low vision in secondary schools in Iganga District. Following the data presented on this table, 15 of the respondents said that the school involves external examiners to support teachers in the teaching of mathematics while 14 of the respondents mentioned sharing of ideas during mathematics club activities within the school as being the support provided to teachers in the teaching of mathematics to students with low vision in secondary schools in Iganga District. 13 respondents identified provision of teaching facilities, 11 of the respondents pointed out facilitation of teachers to attend external workshops and seminars on mathematics, 09 respondents said that the school provides some instructional materials to teachers to support them in the teaching of mathematics to students with low vision, Other 09 respondents said the school involves other organizations to support teachers with specialized training, 04 respondents mentioned organizing internal workshops and seminars on mathematics, 02 respondents mentioned provision of some optical devices.

The findings therefore, reveal that involvement of external examiners to support teachers in the teaching of mathematics, provision of teaching facilities, facilitation of teachers to attend external workshops and seminars on mathematics and sharing of ideas during mathematics club activities within the school were the major forms of support provided to teachers by the school in the teaching of mathematics to students with low vision in secondary schools in Iganga District.

Basing on these findings, the support given to teachers by the school in the teaching of mathematics to students with low vision in secondary schools is inadequate. This therefore, require the secondary

schools to improve on support provisions to teachers in order to enable them teach mathematics more effectively to students with low vision.

Having presented and analyzed data for this study, the next chapter is about discussion of findings, conclusions and recommendations.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the focus is mainly on discussion of findings, conclusions and recommendations based on the set objectives of the study which included:

- The strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District.
- The challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District.
- The support provided to teachers by the school in the teaching of mathematics to students with low vision in secondary schools in Iganga District.

5.2 Discussion of findings on the strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District

Objective one aimed at analyzing the strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District.

The findings of the study on objective one revealed that the use of summarized mathematics handouts, provision of extra time to students with low vision and observing proper seating positions of students with low vision during instructional process were the major strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District.

On the use of summarized mathematics handouts, this is in line with Shepler (2005), who also emphasized on teachers using mathematics handouts containing pertinent information with the view that they could be more easily accessed by the students with low vision during and after classroom interactions. This means that students with low vision find difficulty in conceptualizing wordy print information but rather understand easily summarized information having main points highlighted. Therefore, teachers need to carefully consider low vision condition among their students when designing supplementary mathematics materials such as handouts to enhance mastery of mathematics concepts through self-revision. It is also important for teachers to prepare these handouts in the different font sizes to cater for individual differences among the students with low vision. Where applicable, teachers should consider the aspect of contrast when designing such materials to enable students with low vision read them with a lot of ease.

The findings also reveal that provision of extra time to students with low vision was one of the majority responses in regard to strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District. In conformity with this finding, Diana (2004) also observed that provision of extra time is a strategy in teaching students with low vision in secondary schools. This implies that some mathematical assignments are complex to solve and therefore, students with low vision may need additional time to accomplish them. Teachers are therefore, encouraged to show case in this regard by considering reasonable accommodations for students with low vision such as time factor among others when assessing students with low vision on any given mathematics task to allow them explore their potentials. Many times teachers think that not completing mathematics tasks is only related to inability to understand the task but sometimes the reverse may be true thus failure to give the students

enough time to accomplish the given task because some of them may be slow learners besides having low vision.

Concerning proper sitting positions of students with low vision in classroom during instructional process, Alexander (2003) agrees with this finding when he observes that students with low vision need proper seating positions that permit them to utilize their residual vision more effectively. This is true because some students may be photophobic hence not comfortable with seating positions having much direct light while others may need much light to utilize their residual vision maximally. Some students may have squinty eyes and with such condition, they may opt for particular positions that allow them view the teacher and chalkboard more clearly. In most cases, the visual acuity of students with squinty eyes is located in their peripheral vision. Therefore, teachers should endeavor to establish convenient position in classroom for each student with low vision to enhance the use of their remaining vision during the teaching and learning process of mathematics in secondary schools.

The findings also indicate that group work is one of the strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District. In light of this strategy, Farrenkopf (2000) noted that the use of groups to complete assignments is useful as it provides support in mathematics to students with low vision. This implies that when teachers group students to work out mathematics tasks, then students with low vision benefit from peer discussions leading to mastery of math concepts. Group work also provides opportunity to students with low vision to explore their potentials as they share ideas with their ordinary counterparts. This makes them to gain confidence in

presenting and explaining the mathematics concepts since at peer level of interaction, they have the freedom to express themselves freely without fear. Generally, group work trains students with low vision to learn mathematics through sharing and discovery methods.

The use of optical devices was another finding of this study. Regarding this finding,

Koenig (2000) noted that one of the principle concerns for students with low vision in learning mathematics is their ability to access the visual environment. He therefore, argued teachers to use teaching strategies that enhance accessibility to the visual environment such as the application of optical devices. Teachers are therefore, encouraged to train students with low vision in secondary schools to gain skills and knowledge in using optical devices such as hand held magnifiers, stand magnifiers, telescopes among others to enhance their visual functioning during the teaching and learning of mathematics. However, not all optical devices may be suitable for use by every student. The selection of a particular optical device should be dependent on the assessment results of individual students in relation to their ability to use a given optical device.

Regarding the use of resource persons as one of the findings of the study, Royer (2003) also advocates for involvement of other stakeholders in the teaching of mathematics to students with low vision in secondary schools. When different professionals work as a team, then quality assurance is guaranteed. This implies that chances of making mistakes are limited because of the critical observations of different team players. Without the support of parents as key stakeholders in the education of their children with low vision, the school cannot do much. Parents are responsible for provision of basic needs including

scholastic materials. Parents are also important resource persons because they play a role of monitoring their children's academic progress which includes the teaching and learning of mathematics. Therefore, this practice promotes sharing of ideas between teachers and different professionals as well as parents on how best students with low vision would cope with the learning of mathematics in secondary schools. The findings of the study further indicated that the use of computers with specialized programmes is one of the strategies teachers use in the teaching of mathematics to students with low vision in secondary schools. In support of this finding, Cowan (2005) asserts that teachers should train their students with low vision to use computers in downloading mathematics texts from publishers directly. He also noted that texts on computers could be presented through speech, large print or Braille depending on the software and hardware being used hence giving students a wide range of opportunities to have access to mathematics content. The researcher is in total agreement with this observation because software such as Job Access with Speech (JAWS) among others would promote the teaching and learning process of mathematics to students with low vision in secondary schools.

On the use of task analysis, Ocloo (2003) similarly urges teachers to break down content into teachable units as a reliable strategy in teaching mathematics to students with low vision in secondary schools. This strategy not only caters for students' needs in regard to low vision but also addresses other needs of students with low vision related to slow cognitive processes since the teaching plan considers presentation of specific content at a time which simplifies understanding hence motivating students to develop interest and apposite thinking about mathematics as a subject which is not difficult to learn.

Concerning training in self-monitoring skills, Brooklen (2000) also asserts that teachers should train their students with low vision self-monitoring skills as a strategy geared towards improving the teaching and learning process of mathematics. This strategy would generally help students with low vision to learn how to manage their own work through self monitoring and evaluation. As a result, these students learn how to appreciate their efforts and weaknesses in mathematics which awakens them to take appropriate steps in solving the problems they encounter in this subject area.

The use of clear and simple language was another finding on the strategy secondary school teachers use to teach mathematics to students with low vision. This is in line with Ainscozo (2004) who noted that teachers ought to use simple and clear language which is familiar to students. This implies that teachers need to use appropriate language in classroom when teaching mathematics to students with low vision as a strategy to enable them easily understand the explanations during the instructional process. Using difficult language during instruction would mean excluding students with low vision during the teaching of mathematics in secondary schools.

Another finding about the strategies teachers use to teach mathematics to students with low vision is the use of peer-to-peer. This is in conformity with Koenig (2000) who notes that the use of peer-to-peer support is a reliable strategy teachers should use in the teaching of mathematics to students with low vision in secondary schools. This implies that teachers can identify some capable students in class to be trained to work as their co-teachers in teaching mathematics to students with low vision in secondary schools. This strategy is possible because most students understand easily their fellows than teachers probably due to the fact that they use common language familiar to them.

Conclusively, effective teaching of mathematics to students with low vision depends on effective implementation of the recommendations reached following assessment results because every student or particular group of students with low vision may require particular intervention strategy which suits individual learning needs which may vary due to differences in the age of onset besides other factors.

5.3 Discussion of findings on the challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District

Objective two sought to find out the challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools. According to the findings, fear of mathematics by students with low vision, negative attitudes towards students with low vision lack of adapted teaching materials, and difficulty in teaching some topics in mathematics were the main challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District.

Concerning fear of mathematics by students with low vision, Ashcraft (2002) in a similar development noted that mathematics phobia tends to make students feel negative towards math subject in schools causing challenges to teachers during teaching and learning process. This implies that students with low vision may turn to be a challenge to teachers if they are not motivated to learn mathematics. This is true because teaching mathematics to students who have developed fear for the subject would mean learning with less or no interest which eventually affects teachers during the instructional process. Every teacher

loves working with a group of students who are motivated to learn the given subject. A lot of myth has been said about mathematics not only at secondary level but all levels and as a result, this leaves many students with a lot of questions unanswered most especially those with low vision hence living in the world of panic and fear which affects grossing the teaching of mathematics to such students in secondary schools.

On negative attitudes towards students with low vision, Ashcraft (2002) also observed that mathematics phobia tends to make students feel negative towards math subject in schools which gives challenges to teachers during teaching and learning process and that this experience makes teachers to develop negative attitudes towards their own students with low vision in secondary schools. Many teachers sometimes think that having low vision is associated to having gaps in the cognitive functioning and as a result they tend to observe students with low vision with negative feelings which affect their teaching of mathematics to them due to poor teacher- student relationship in class and outside class. The researcher is in total agreement with this argument because teaching students who have low self-esteem in the subject is demotivating to teachers and as such, a teacher is compelled to develop negative attitude towards such students.

Lack of adapted teaching materials as one of the major challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools conforms to Stipek (2003), who asserts that teachers are faced with a challenge of limited mathematics large text materials which would aid in the teaching of students with low vision. This means that the available mathematics text materials in schools do not suit the needs of students with low vision. In this case, teachers find it hard to teach mathematics to students with low vision using ordinary instructional materials. However, it may not be very easy for teachers to access readily available adapted educational materials. Instead, they need to

undertake initiatives in adapting locally available educational materials to suit the needs of students with low vision in relation to teaching and learning of mathematics in secondary schools. Though adapting these locally available educational materials is a good initiative, it equally presents a number of challenges to mathematics teachers in secondary schools. This is because some teachers may not have sufficient knowledge and skills in adapting the educational materials to meet the needs of individual students with low vision.

Experiencing difficulty in teaching some topics in mathematics as advanced by the findings is in line with Royer (2003), who affirms that teachers find challenges in integration of knowledge network to connect the world of real quantities, world of counting numbers and world of formal symbols. This implies that mathematics require teachers to acquire competence on the construction of a rich set of relationships among these worlds through participating in workshops and seminars aimed at building their competences in content areas of this subject. Teachers find it difficult to teach certain topics to students with low vision such as Trigonometry, further vectors, logarithms among others. This generally makes mathematics teachers to exhibit some levels of incompetence in teaching mathematics and as a result, they tend to skip these vital areas due to limited expertise in content delivery hence a challenge affecting their work when teaching mathematics to students with low vision in secondary schools.

About poor teaching facilities, Keefe (2004) also highlights the challenge teachers face in schools with poor lighting system in classrooms and resource rooms. He further explains that in such schools, assessment of low vision becomes difficult and that if any, the results may not be consistent. This therefore, makes it difficult to design appropriate interventions in the teaching process due to inconsistency in the assessment results arising from using poor facilities such as resource rooms which

are not properly designed to serve the right purpose. Teachers therefore, need to influence the school administration to realize the need of improving on teaching facilities and resource rooms in order to have a conducive working environment which supports teaching and learning process of students with low vision in secondary schools.

ited instructional materials, Stipek (2003) similarly noted that teachers are faced with a challenge of limited mathematics large text materials which would aid in the teaching of students with low vision. This relates to Poel (2007), who cites shortage of reference books in schools as one of the challenges teachers encounter in their day to day work. This implies that due to shortage of mathematics reference books, teachers tend to find a challenge in preparing appropriate schemes and lesson plans for students with low vision in secondary schools. Effective preparation of teachers for instructional process requires one to have variety of references to allow comparison of mathematics content and methodologies used in working out different content areas. This enables a teacher to have insight into the expected standards of mathematics content and its delivery process adapted to the needs of students with low vision in secondary schools.

Failure to provide large print graph papers by UNEB conforms to Stipek (2003) who asserts that teachers are faced with a challenge of limited large text materials which not only affects teaching of mathematics to students with low vision but also their examinations. This means that some questions during exams may require large print graph papers to suit the needs of students with low vision and therefore, absence of such materials makes it difficult to attempt particular questions on graph work. For

this case, secondary schools need to bring to the attention of UNEB the need to consider all the candidates in their planning process for effective conduct of the national examinations. This can be done during the subsequent briefings in preparation for national examinations or writing direct to the executive secretary UNEB. Without the necessary examination materials, students with low vision cannot compete on equal basis with the rest of the students hence a challenge not only to them but also their teachers.

Limited knowledge on general methodology of teaching mathematics was another finding of this study. This is in line with the study on challenges faced by mathematics teachers from the International Comparative literature highlights Pedagogical differences arising from rigid teacher training curriculum as a major challenge teachers experience in the teaching of mathematics to students with low vision in secondary schools (Ball, 2005). This means that inadequate training of teachers affects their knowledge and expectations in the teaching of mathematics to students with low vision. When teachers demonstrate failure on the methods of instruction, they tend to lose confidence and therefore, even their students doubt them. This tendency makes students with low vision not reached adequately during the instructional process and in turn the blame is put on their teachers which stand as a challenge to them in teaching mathematics to this group of students in secondary schools. It is therefore, important for teachers to learn to consult from each other in order to gain appropriate knowledge, skills, values and experience relevant in teaching all topics in mathematics to students with low vision in secondary schools.

Other challenges revealed by the findings included high enrolment, limited motivation and high expectations from parents. On high enrolment, Waldron (2006) similarly observed that teachers find it difficult to attend to every student's needs due to increased numbers of students and as such the teaching of mathematics to students with low vision becomes a challenge to them. The high enrolment also makes it very difficult to share limited instructional materials amongst students with low vision which is in line with Stipek (2003) who also observed that shortage of large print materials significantly affect teachers' work in regard to the teaching of mathematics to students with low vision in secondary schools.

Regarding limited motivation of teachers, Ndurumo (1998) similarly cites the need for schools to support teachers with the necessary resources such as modern library services, accommodation facilities, and reasonable remuneration to help them concentrate on working to achieve their primary goal in schools. This means that when teachers are not motivated in their work, there is a likelihood of teaching mathematics to students with low vision with low morale hence a challenge.

Finally on high expectation by the parents, Kaufman (2007) in a related development affirms that parents tend to mount too much pressure on teachers with the view to make their children achieve beyond their potentials. This not only affects these students with low vision but also teacher- parent working relationship. Such tendencies lead to endless conflicts between teachers and parents hence a big challenge that affects teachers in the teaching of mathematics to students with low vision in secondary schools.

5.4 Discussion of findings on the support provided to teachers by the school in the teaching of mathematics to students with low vision in secondary schools in Iganga District

Objective three aimed at examining the support provided to teachers by the school in the teaching of mathematics to students with low vision in secondary schools in Iganga District.

The findings on objective three reveals that involvement of external examiners to support teachers, provision of optical devices, provision of teaching facilities, facilitation of teachers to attend external workshops and seminars on mathematics and sharing of ideas during mathematics club activities within the school were the major forms of support provided to teachers in the teaching of mathematics to students with low vision in secondary schools in Iganga District.

Regarding involvement of external examiners to support teachers, Duncan (2003), in a similar development observed that provision of specialist mathematics support to teachers instills direct mathematics knowledge and skills that can promote confidence to teachers when teaching students. This means that teachers in secondary schools need special support from experts to increase on their abilities in teaching mathematics to students with low vision in secondary schools.

Concerning provision of some optical devices, Keefe (2004) also noted that schools in collaboration with parents should provide teachers with adequate optical devices like stand and hand held magnifiers including classroom telescopes to aid in enhancing the functional vision of students with low vision.

This not only supports teachers to teach but also motivates students to learn mathematics with high interest and ease. Unfortunately, this support is inadequate as reflected in the study findings.

On provision of teaching facilities, Heward (2000) similarly highlighted that teachers can play a significant role in teaching mathematics to students with low vision when the school plans to address classroom physical gaps such as lighting system and space to allow classroom structuring for easy location of educational materials and equipment. Students with low vision therefore, need a conducive learning environment which supports teachers in using Non-Optical devices to teach mathematics which include but not limited to light, distance, contrast, size and position.

Facilitation of teachers to attend external workshops and seminars on mathematics as advanced by the study findings is in conformity with Alec (2006), who asserts that the school system should be mindful of supporting teachers to meet the ever increasing demands in the teaching and learning of mathematics. He further observed that teachers ought to be facilitated to attend workshops, seminars and conferences on the current trends in mathematics. This kind of arrangement helps to improve classroom practices in this subject area. Workshops and seminars generally create a good platform for teachers to share experiences and develop constructive arguments that lead to improved support given to students with low vision in secondary school.

The findings further indicated that organizing internal workshops and seminars was one of the ways through which teachers are supported. However, this leaves a lot of questions whether or not the implementation is reliable since very few respondents pointed it out. In a related development, Alec (2006), asserts that the school system should be mindful of supporting teachers to meet the ever increasing demands in the teaching and learning of mathematics. He further noted that teachers ought to be facilitated to attend workshops, seminars and conferences on the current trends in mathematics. Such arrangements help to improve classroom practices in this subject area as a result of shared ideas on teaching of mathematics to students with low vision in secondary schools.

On sharing of ideas during mathematics club activities within the school, Beverly (2006) in a related development pointed out that teacher support groups within the school setting would help to empower teachers with relevant mathematics skills. This implies that teacher support group could be a mathematics club which is a great way to enable mathematics teachers grow professionally since members provide each other with various types of help in the areas of difficulties. However, club activities require some resources to run more effectively and also good leadership to keep the members united and hardworking in order to achieve the primary goal of improving on the teaching of mathematics to students with low vision.

Another finding of this study was provision of some instructional materials to teachers which conforms to Linden (2009) who noted that schools have the obligation to provide teachers with prep books, pens and other chalkboard materials deemed necessary in the teaching of mathematics to students with low

vision in secondary schools. This means that when teachers are supported, then they get motivated to execute their role of teaching mathematics more effectively to students with low vision in secondary schools. It is also important to note that teachers may need other provisions beyond instructional materials to enable them perform to their maximum. Such provisions may include accommodation, medical insurance, reasonable salaries among others. All in all, teachers need generally good working conditions to concentrate on the meaningful planning aimed at improving the teaching of mathematics to students with low vision in secondary schools. This implies that effective teaching and learning process of mathematics requires adequate support to mathematics teachers and students with low vision in secondary schools.

Concerning involvement of other organizations to support teachers with specialized training, Duncan (2003) similarly observes that provision of specialist support to teachers instills direct mathematics knowledge and skills that can promote confidence to teachers when teaching students. This means teachers in secondary schools need special support from experts to increase on their abilities in teaching mathematics to students with low vision. It is therefore, important for secondary schools to allow their teachers benefit from external support provided by technical organizations such as kyambogo university, Visio international among others.

5.5 Conclusions

The use of group work, use of summarized mathematics handouts, provision of extra time to students with low vision, and observing proper seating positions of students with low vision during instructional

process were the major strategies teachers use in teaching mathematics to students with low vision in secondary schools in Iganga District.

Fear of mathematics by students with low vision, negative attitudes towards students with low vision, lack of adapted teaching materials, and difficulty in teaching some topics in mathematics such as Construction, Bearing, Trigonometry and Further vectors were the main challenges experienced by teachers in teaching mathematics to students with low vision in secondary schools in Iganga District.

Involvement of external examiners to support teachers, provision of some optical devices, provision of teaching facilities, facilitation of teachers to attend external workshops and seminars on mathematics and sharing of ideas during mathematics club activities within the school were the major ways through which the school provides support to teachers in the teaching of mathematics to students with low vision in secondary schools in Iganga District.

Generally, the use of multi-disciplinary approach could be fundamental in improving teachers' competence in teaching mathematics to students with low vision in secondary schools.

5.6 Recommendations

The following are the recommendations advanced as a result of this study:

- The government should enact a policy to guide teachers in the teaching of students with low vision in secondary schools.
- There is need to sensitize all stakeholders on reasonable accommodations for students with low vision in mathematics in secondary schools.

- Secondary schools should provide adequate support to teachers to enable them effectively teach mathematics to students with low vision in secondary schools.
- Secondary schools should ensure mandatory Assessment of students with low vision to establish their needs in mathematics among other academic areas in order to design appropriate interventions to cater for individual differences.
- Secondary schools should train students with low vision to use recorders during the teaching of mathematics to enable them have content on audiotapes for reflection after the instructional process for effective revision.
- Secondary schools should initiate guidance and counseling services to help students with low vision overcome fears in mathematics.
- There is need to involve resource persons to empower teachers with knowledge and skills in teaching all topics in mathematics to students with low vision as well as adapting teaching materials to suit their needs.
- The Uganda National Examination Board (UNEB) should consider the needs of students with low vision in mathematics during national exams.
- Secondary schools should lobby for Computers with specialized software such as Job Access with Speech (JAWS) to support students with low vision in learning mathematics.

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APPENDIX I: SEMI- STRUCTURED INTERVIEW GUIDE FOR HEADTEACHER

Dear sir/madam,

I am Bugohe Peter, a student of Kyambogo University pursuing Masters of Special Needs Education. Research is one of the requirements for the award of this Masters. This semi structured interview guide is designed for use in the study entitled: “The Teaching of Mathematics to Students with Low Vision at Iganga Secondary School.” You have been selected to participate in this study because of your experience in secondary schools. Your responses will be kept confidential and only used for purposes of this study. I therefore, request you to answer the following questions:

1. What is your gender?
2. What is your highest professional qualification?
3. How long have you worked as a Head Teacher in secondary schools?
4. What is your area of specialization as a professional teacher in secondary school?
5. How do students with low vision perform in mathematics compared to the ordinary students in your school?
6. What strategies do teachers use in teaching mathematics to students with low vision in your school?
7. What kind of challenges do teachers face in teaching mathematics to students with low vision in your school?

8. How does the school support teachers in the teaching of mathematics to students with low vision?

9. Do you have additional information in relation to the teaching of mathematics to students with low vision in your school?

Thank you

APPENDIX II: SEMI STRUCTURED INTERVIEW GUIDE FOR TEACHERS

Dear sir/madam,

I am Bugohe Peter, a student of Kyambogo University pursuing Masters of Special Needs Education. Research is one of the requirements for the award of this Masters. This semi structured interview guide is designed for use in the study entitled: The Teaching of Mathematics to Students with Low Vision at Iganga Secondary School. You have been selected to participate in this study because of your experience in secondary schools. Your responses on each question in this interview guide will be kept confidential and only used for purposes of this study. I therefore, request you to answer the following questions:

1. What is your highest professional qualification?
2. How long have you worked as a teacher in secondary schools?
3. What is your area of specialization as a teacher in secondary school?
4. What is the general performance of students in mathematics in your school?
5. How do students with low vision perform in mathematics compared to the ordinary students in your school?
6. What strategies do you use in teaching mathematics to students with low vision in your school?
7. How do students with low vision react towards your strategies of teaching mathematics?
8. What kind of challenges do you face in teaching mathematics to students with low vision in your school?
9. How does the school support you in the teaching of mathematics to students with low vision?
10. Do you have additional issues you would like us to share about the teaching of mathematics to students with low vision in your school?

Thank you

APPENDIX III: SEMI STRUCTURED INTERVIEW GUIDE FOR STUDENTS WITH VISION

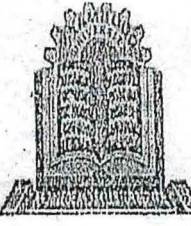
Dear Student,

I am a student of Kyambogo University pursuing Masters of Special Needs Education. Research is one of the requirements for the award of this Masters. This semi structured interview guide is designed for use in the study entitled: The Teaching of Mathematics to Students with Low Vision at Iganga Secondary School. You have been selected to participate in this study because of your experience in secondary schools. Your responses on each question in this interview guide will be kept confidential and only used for purposes of this study. I therefore, request you to answer the following questions:

1. In which class are you?
2. How long have you been in this school as a student?
3. What is your choice of subjects or combination?
4. What is the general performance of students in mathematics in your school?
5. How do you perform in mathematics compared to your ordinary peers in your school?
6. What strategies do teachers use in teaching you mathematics in your school?
7. What is your comment on the strategies teachers use to teach you mathematics?
8. What challenges do you face generally in learning mathematics in your school?
9. How does the school support your teachers in the teaching of mathematics to you?
10. Do you have additional issues you would like us to share about the teaching of mathematics to students with low vision in your school?

Thank you

APPENDIX IV: INTRODUCTORY LETTER



KYAMBOGO UNIVERSITY

P. O. BOX 1, KAMPALA
FACULTY OF SPECIAL NEEDS & REHABILITATION
Tel: 0414-286237/285001/2 Fax: 0414-220464
DEPARTMENT OF SPECIAL NEEDS STUDIES

15th January, 2018

The DEO/DIS/Head teacher/Teacher/Community/Opinion Leader/Church Leader

.....
.....

Dear Sir/Madam,

RE: INTRODUCTION OF RESEARCH STUDENT ON DATA COLLECTION

This is to introduce the bearer Rev/Dr/Sr/Mr/Mrs/Ms... BUGOHE PETER...
Reg.No: 15/L/15951/GMSN/PE.... who is a bonafide student of Kyambogo
University in the Faculty of Special Needs and Rehabilitation, Department of Special
Needs Studies. As partial fulfillment of the requirement for the award of the
Diploma/Degree, he/she is required to undertake a research on the approved area of
study.

The purpose of this letter is to request you to allow him/her have access to information
from your office, school or area of operation necessary for the study.

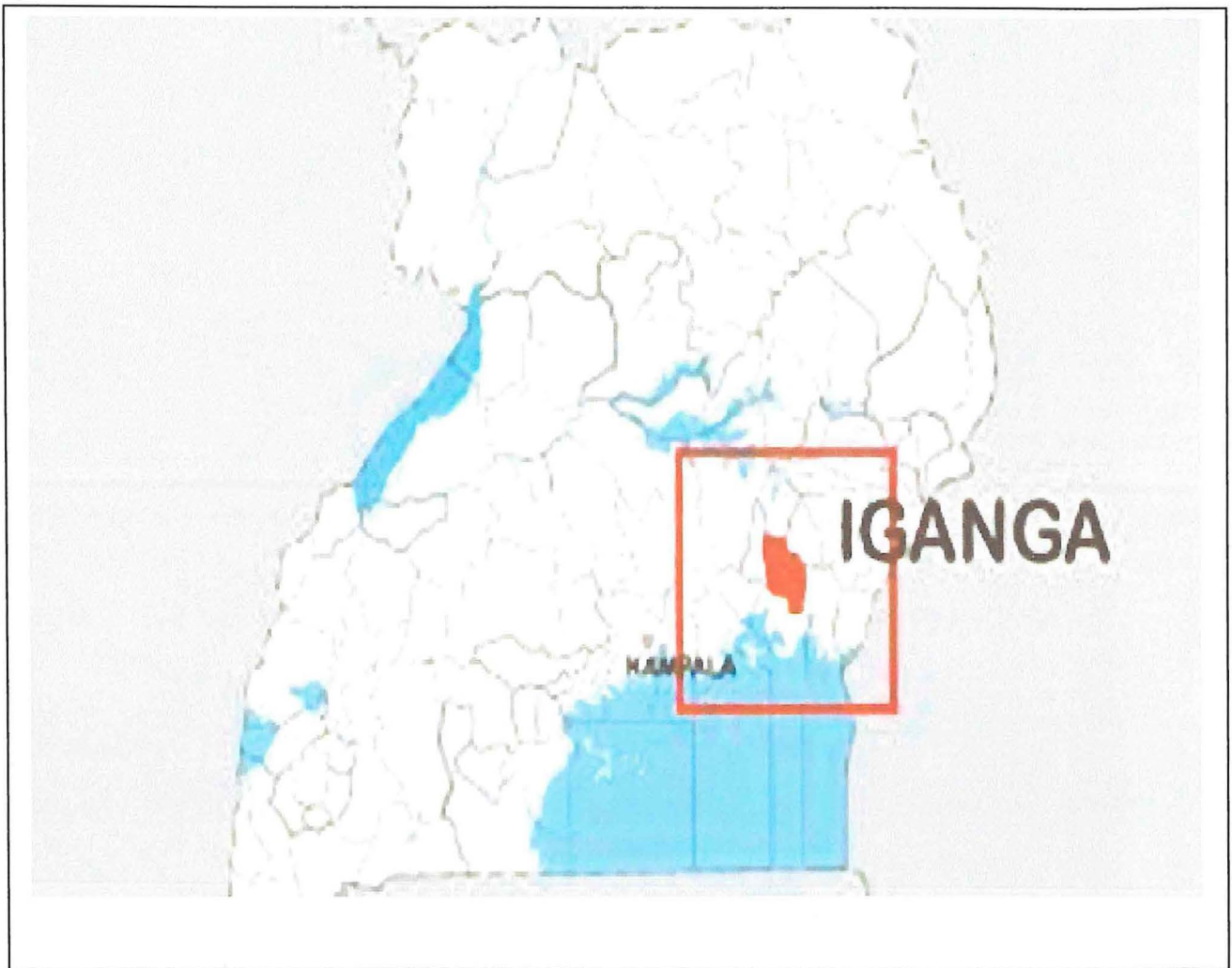
Kyambogo University will be grateful for any assistance rendered to the student.

Yours faithfully,

Dr. Okwafut Stackus
HEAD OF DEPARTMENT
Special Needs Studies

OS/nj

APPENDIX V: MAP OF UGANDA SHOWING IGANGA DISTRICT



APPENDIX VI: MAP OF IGANGA DISTRICT SHOWING AREA OF STUDY

