

METHODS OF TEACHING MATHEMATICS AND ACADEMIC
PERFORMANCE OF LEARNERS
IN REGULAR PRIMARY SCHOOLS IN
SHAMATA ZONE, NYANDARUA
DISTRICT, KENYA.

A RESEARCH REPORT SUBMITTED TO THE INSTITUTE OF OPEN
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DECLARATION

I, Daniel Gachihi Tuchura (BED/14959/62/DF) declare that this material book has not been presented elsewhere for any academic qualification and any inconsistency am responsible.

I further declare that all materials cited in this paper which are not my own, have been duly acknowledged.

Signed


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Date

15/4/09.
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APPROVAL

This research report has been submitted for examination with my approval as the candidates' university supervisor.



.....
Nankya Oliver



.....
Date

DEDICATION

This research study is dedicated to all teachers teaching mathematics in Shamata zone, Nyandarua District, Kenya for their cooperation during the data collection. I also dedicate it to my wife and my children for their encouragement when I was working on the research.

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OPERATIONAL DEFINITION OF TERMS OF KEY CONCEPTS

Attitude: Refers to the feeling towards a certain thing.

Challenges: Refers to difficulties faced by people.

Data: Refers to the information collected from the population being studied.

Instructional methods: Refers to methods of teaching: The styles and techniques used in teaching.

Private Primary school: Refers to schools run by individuals without government assistance.

Public Primary school: Refers to primary schools run by the Government with the assistance of parents.

Regular schools: Refers to the ordinary schools in an inclusive setting.

Sample population: Refers to a small group selected to represent the whole population in the area to be studied.

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ABSTRACT.

This study is about methods of teaching mathematics and academic performance of learners in regular primary schools in Shamata zone which is in Nyandarua North District in Kenya. After a careful thought in respect to how mathematics is performed in the area, the researcher saw it was imperative that a study be conducted to investigate the teaching methods in relation to academic performance.

The method used in research approach was both quantitative and qualitative approach. The research design was survey method. The instrument used was a questionnaire. The researcher used 20 teachers as his respondents. This was a sample population in Shamata zone.

The respondents gave out the difficulties they encounter while teaching mathematics and the teaching methods they use while teaching as requested in the questionnaires. It was noted that there is gender disparity of which boys have more interest than girls. Learners perform poorly for they have negative attitude towards mathematics.

Recommendations were put forward as follows:-There should be in-service training courses for teachers, learners individual difference should be taken care of, remedial teaching should be done frequently, pupils and teachers should be motivated properly, among others.

CHAPTER ONE

THE PROBLEM AND ITS SCOPE

1.0 Introduction

This is the first chapter of this research paper. It views the background, objectives, research questions, theory, among others.

1.1 Background Information

Mathematics is one of the major subjects taught in school. The word mathematics is derived from the Greek word mathematics, which means "inclined to learn." This is according to Sudhir Kumar, (2003: 7).

Many adults and learners harbor fear or loathing of mathematics, and unfortunately these attitudes are often reinforced by classes that present mathematics as an obscure and sterile subject. Learning to solve problems is the principal reason for studying mathematics; this is according to Albert B. (2001). Problem solving should be the central focus of the mathematical curriculum.

Mathematics enables learners to acquire clear and logical thought. It is also a base for scientific development and modern technology. Mathematics is the key to opportunity. No longer just the language of science, mathematics now contributes in direct fundamental ways to business, finance, health and defense as stated by Jeffrey O. (2002).

For students it opens the doors to careers, for citizens, it enables informed decisions, for nation it provides knowledge to compete in a technological economy.

Mathematics is taken as a very difficult subject by majority of the learners. Most of them ignore the subject and concentrate in other subjects.

Many people do not have the necessary mathematical skills to apply to real life situations when they leave primary school. This is because they did not get the opportunity to develop their mathematical abilities as they should.

It is a general view that children learn mathematics better if their abilities, needs and interest are taken into account when planning teaching and evaluating maths lessons.

For one to be able to understand mathematics concepts there is need to be taught properly. When teaching the subject, a teacher may think that learners have followed the steps in the right way, only to learn later after testing that most of the learners perform poorly. This discourages the teachers as they fail to understand the reason behind the poor performance.

The teaching of mathematics can be at times may be interesting, challenging and difficult to some teachers and pupils. Whenever the National Examination Council releases the results, there is always hue and cry due to the pupils' poor performance in mathematics. Teachers feel so much disappointed when they reflect that mathematics was of the poorly performed subject.

Different people have put forward various views as to why mathematics is performed poorly. Some attribute the poor teaching methods. Others argue that lack of teaching and learning resources during the course of learning is the cause.

In most cases teachers are the one who get the blames. The burden of poor performance rests on their shoulders. Teachers view the poor performance in a different way. They claim that there are many factors which influence learners' performance in mathematics in primary schools.

Teachers work tirelessly to make sure that they complete the work in the syllabus yet they get no good fruits. Other stakeholders such as parents, academicians and administrators have given different solutions on how the problem can be overcome.

As teachers undergo this problem of how to teach mathematics, Shamata zone Nyandarua District in Kenya is not an exception. This has prompted the researcher to try to find out whether the methods used in teaching mathematics are the real cause of the poor performance.

1.2 Theory

This study is based on theory of learning and cognitive process. Theorists define learning as a relatively permanent change due to experience. This is stated by Jeanne O. (2003). Behaviorists describe learning in terms of the observable responses that people make and the environmental stimuli that influence how those responses change over time. Cognitive psychologists describe it in terms of such internal mental processes as attention, memory and problem solving. According to social cognitive theorists, people learn by observing and imitating those around them.

Most cognitive psychologists propose that learning does not involve absorbing information directly from the environment; instead it involves constructing one's own understanding of the world. The

things that students do mentally with classroom subject matter will determine how they learn and remember it.

Strategies for helping to process and learn classroom subject matter include showing how it relates to prior knowledge, presenting it in an organized fashion, asking pupils to draw inferences, providing mnemonics for seemingly "meaningless" pairs and lists.

Retrieving information from long term memory appears to be a process of following pathways of associations.

Students' attempts at retrieving what they have learned are more likely to be successful if children have learned classroom subject matter to mastery and connected it with numerous things they know, if they use it frequently and if relevant retrieval cues are present in their environment.

According to Jeane O. (2003) students cognitive process will differ in part as a function of their cultural backgrounds, English proficiency, and any special educational needs that they might have. At one time or another, all students are likely to have difficulty in processing and learning classroom subject matter. By considering and fostering the specific cognitive processes involved in effective learning, teachers can help all students achieve classroom success.

According to aspects of Maslow's theory of hierarchy, students will not show much intrinsic motivation to learn classroom material until they are rested and well-fed, feel safe and secure in their classroom, and enjoy the love and respect of their teachers and classmates.

1.3 Statement of the Problem

Many teachers handling mathematics in regular schools face a lot of problems as they perform their daily duties. Their methods of teaching mathematics are usually questioned by stakeholders. The whole society develops negative attitude towards teachers as they expect good academic performance from their children after the course of their learning.

Teachers blame parents and administrators who also blame them. The blame without solution leaves teachers disappointed and they continue doing their tasks as usual.

The Emergence of private schools has worsened the situation as they perform better than the regular public schools. Able parents end up transferring their bright children to these private schools. The unfortunate financially continue putting their blames to teachers helplessly.

In this respect, it is therefore imperative that a study is conducted to investigate the methods of teaching mathematics and academic performance in regular primary schools in Shamata zone in Nyandarua North District, Kenya so that remedies can be put in practice to counter the trend.

1.4 Purpose of the Study

The purpose of this study is to examine the methods of teaching mathematics and academic performance of learners in regular primary schools in Shamata zone in Nyandarua North District, Kenya. It is hoped that by addressing these methods of teaching mathematics, teachers handling mathematics would assist the learners positively and the performance be uplifted. Other

stakeholders in education would also join hands with teachers and assist the children accordingly.

1.5 Objectives

General Objective

The aimed at investigating the impact of teaching methods on academic performance in learners in regular primary schools in mathematics.

Specific Objectives

To identify difficulties that teachers undergo when teaching mathematics.

To establish factors affecting learning of mathematics

To find out reasons why mathematics is performed poorly in regular public primary schools.

To examine the different methods of teaching mathematics effectively in regular primary schools.

To investigate the impact of teaching methods on academic performance on learners in regular primary schools in mathematics.

1.6 Research Questions

What are the difficulties that teachers undergo when teaching mathematics?

Which factors affect learning of mathematics?

Why is mathematics performed poorly in regular public primary school?

What are the different methods of teaching mathematics effectively in regular primary schools?

Is there an impact of teaching methods on academic performance on learners in regular primary schools in mathematics?

1.7 Significance of the Study

The research hoped that the outcome of the study would make it possible to find solution to the challenges and teaching styles encountered in mathematics in Shamata zone.

Teachers will get out of the blame if they adhere to the findings.

The findings will assist parents and education, to enhance positive attitude towards handling of mathematics and hence provide the necessary services, facilities and resources.

The findings will also play a significant role in curbing excuses of transferring children from public schools to private schools.

The concerned may also see the light and assist accordingly to uplift the standard of mathematics in schools.

The learners will feel motivated and embark on taking mathematics as subject which equips one with skills and knowledge of solving day to day problems.

The ministry of Education will be well informed on relevant teaching and learning materials which are necessary when handling mathematics. As the ministry offers the right assistance, the standard of mathematics will automatically improve.

1.8 The Scope of the Study

The study was meant to examine various teaching methods of teaching mathematics and the factors that lead to poor performance in mathematics in order to solve the problem. The study was conducted in Shamata zone which is in Nyandarua North District in Central Province, Kenya. The study was expected to come up with the appropriate methods of teaching mathematics and highlighting the various factors that hinder good academic performance with an aim to improve it.

1.9 Limitations

Time: was not adequate for the researcher to move to all schools in Shamata zone as they are far apart. Otherwise it would have been important to conduct intensive study throughout the zone to get comprehensive information on the methods teaching in relation to the poor performance in regular schools.

Financial challenges: Printing and duplicating the questionnaire required money. Transport from one school to another also needed to be financed.

Accessibility: The roads in Shamata zone are all weather roads. They are not easily accessible during wet season. The researcher had to foot to reach some schools.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This is the second chapter. It analyses the views of different authors who wrote about the above highlighted topic.

2.1 Background

Mathematics is a discipline that deals with numbers, operations, rules and theories. It provides a means of communication, which is clear, consistence, concise and cogent. Children are taught mathematics to acquire clear and logical thought. In real life situation, knowledge of mathematics is very important. Children learn mathematics better if their activities, needs and interest are taken into account.

There are various sub topics that are to be dealt with in this chapter. These are:- instructional methods used in mathematics classrooms, mathematics phobia, misconception of aptitude for mathematics, nature of mathematics, attitude towards learning of mathematics, teaching and learning resources, teacher qualification and in-service training for teachers, mathematics syllabus, motivation, teaching of slow learners, mathematics language, psychology of mathematics, mathematics in relation to curriculum, recreational mathematics, classroom environment and learning mathematics.

Mathematics helps in viewing and making sense of the real world. A working knowledge of mathematics is necessary in order to understand other subjects.

2.2 Instructional Methods Used In Mathematics Classrooms

Instructional methods are also called methods of teaching and learning; Knott & Mutunga (1995). They refer to a broad set of teaching approaches, practices, techniques, rules, routines and procedures employed by teachers in aiding learning. According to Curzon (1990) the instructional approaches, are used together with instructional media and teachers' provision of feedback.

The approaches includes lectures, groupwork, question and answers approach, supervised practise, teachers provision of feedback from tests and assignments, guided discovery, practical activities in and out of mathematics classrooms, revision work, mathematical games, uses of examples and discussion of mathematical problems.

Lecture method

In a strictly lecture teaching approach, a teacher talks most of the time, uses audio-visual materials to illustrate mathematical concepts, work out mathematical problems and chalkboard and finally summarizes the main points of a lesson on chalkboard while students listen, take notes and have limited chances of asking questions; knott & Mutunga (1995).

Clarity of content of subject matter, teacher's enthusiasm while teaching and proper communication skills are essential if lecturers have to be effective; Good & Brophy (1995). Clarity has to do with understanding of mathematical concepts, structuring mathematical activities, sequencing, explaining and presenting the right amount of content in a given time, convenient facing and proper articulation of mathematical content.

In between mathematical activities, periodical internal summaries could be given in addition to the major summary at the end of a lesson.

According to Good & Brophy (1999), during lectures, vague terms, halting speech (mazes) and irrelevant digressions should be avoided. The appropriate communication skills are: Optimal pacing of content, gestures, facial expressions, appropriate movements and pointing in addition to oral communication.

According to Hamacheck (1995) academic subjects that have structural information and skills such as mathematics, languages and sciences require direct teaching that demand that teachers review pre requisites, state lesson objectives, give guided practice accompanied with feedback, allow supervised individual work and finally give review through question and answer session or problem solving. Therefore a purely lecture method is not effective in the teaching of mathematics at any level.

Working in small groups

In this approach of teaching students are given some work to do co-operatively in small groups; Marr & Hellen (1996). According to Johnson and Johnson (1995) students learn in groups by participating actively in a relaxed friendly atmosphere. They agree that the method is task oriented, gives learners an opportunity to be active, practice social skills and exercise freedom and responsibility in a group.

According to Stasser, Kerr & Davis (1990), groups are more able to recognise and adopt correct problem solving strategies when suggested by a group member. Groups quickly detect errors of problem representation and reject them. They contend that groups

are able to process more information collectively than individuals for problem solving. According to Burden (1995) group can be based on students' ability, interest, skill, activity or on integration. Depending on the objective of a lesson he contends that a group could be a mixed ability one, a co-operative learning group or a peer tutoring group working on some identified problem. According to Johnson and Johnson (1979) students are motivated in groups through cognitive controversy. In group classroom arrangement a teacher directs and supervises the activities of each group and finally obtains results from each group leader of a class discussion; Munetsi (1994).

According to Biehler and Snowman (1997), in cooperative learning groups, students' self-esteem, self- efficiency, effort and regular attendance in class are enhanced, students are motivated to learn by being given an opportunity to praise others, receive help and praise from others and have opportunity to elaborate personal views during learning.

Research findings on women learning mathematics in a tertiary institution in Britain indicated that women learn mathematics better when working in groups; Isaacson (1996).

Question and Answer

In this teaching approach a teacher introduces a lesson, asks pupils probing questions while pupils answer the questions. A teacher may give pupils cues leading to the correct responses. Finally the teacher summarizes the main points of a lesson on chalkboard. According to Walkin (1994), planned questions stimulate, encourage and consolidate learning as instruction progresses while verbal praise of students for correct response motivates them to learn. According to Good and Brophy (1995) questions should be clear, purposeful,

brief, asked in natural language, addressed to entire class in normal conversational tone and asked one at a time. They also indicated that frequency of interactions and time spent waiting for students responses (Wait time) and the time spent on interacting with students during classroom instruction have far reaching implications on learning.

Supervised practice from mathematics textbooks.

A teacher asks learners to individually work out mathematical exercises from a textbook in class while he/she goes round supervising the work and attending to individual difficulties; Jaji (1993). This helps learners to have a feeling of self-confidence, satisfaction, competence and self-worth due to the opportunities afforded to them to apply mathematical skills, heuristics, algorithms and use of different cognitive strategies to solve mathematical problems.

Teachers' feedback from assignments and texts

In this approach teachers mark assignments and tests and may give students verbal or written comments pinpointing errors, mistakes and mathematical misconceptions; Dean (1982). The way feedback is given to students could motivate or de motivate them to learn; De Cecco & Crawford (1988), enhance a lower learner's mathematics self-concept and subsequently their effort and persistence at mathematical tasks, achievement and future course selection. Feedback enriches learners' mental scheme and provides emotional support; Heinich, Molenda, Russels & smaldino (1996).

According to Hamacheck (1995) teachers' feedback encourages repetition of use of skills at which a learner is successful, helps in correction and improvement of unsuccessful responses, provides

incentive for accurate performance, increases effort and helps in the realisation of proximal goals during learning.

The research available; Kochlar (1990) has indicated the importance of feedback during mathematics instructions and has also indicated that it can both be facilitating and debilitating to the learning of mathematics.

Guided Discovery

This is an inductive teaching approach in which the learner is led towards understanding principles through grappling with a problem situation; Heinich et al (1996). In this teaching approach a teacher initiates mathematical facts or contents to be explored. Usually students are guided and led to discover facts, concepts or methods of solving mathematical problems by themselves; Dean (1992). Discovering techniques are most useful when students have the necessary skills and motivation to succeed; Dembo (1994). He contends that guided discovery can be used as a supplementary procedure to teach problem solving skills, stimulate curiosity and encourage more self-directed learning.

Bruner (1961) believed that discovery learning emphasizes high level thinking, focuses on intrinsic rather than extrinsic motivation and helps students to remember important information and take responsibility for their own learning. Teachers' responsibility in guided discovery approach of instruction is to plan, confirm students' findings and facilitate the learning process.

Practical mathematical activities in mathematics room

A teacher in mathematics classroom provides materials and instructs students on what to do. They may be asked to construct three dimensional models for teaching geometry or any other

construction. The activities should have mathematical value. This method of teaching enhances psychomotor skills, helps students to discern mathematical relationship in objects and concretizes mathematical concepts. Learning by doing raises learners level of recall and retention of mathematical content in long term memory; Kluwe, Haider & Misiak (1990).

Out of class mathematical activities.

These are practical tasks that involve working out mathematical problems outside the classroom, for instance, calculating height of building, width of a river or any other mathematical task when given some information. Students are usually active, cooperative and self-reliant when given an opportunity to solve problems outside the normal mathematics classroom. This method stimulates students' interest and creativity (UNESCO, 1997; Zverev 1983). learning by doing has more advantages than direct teaching Kluwe et al (1990). They contend that it lightens motivation and effects retention of information and better transfer of knowledge to solution of problems.

Revision of questions from tests and past examinations

In this approach of teaching, teachers ask students to answer mathematical problems from past tests, mark them, give students feedback then take time to go over the questions in a detailed and structured way. Teachers explain to students how to answer the questions and give them further practical; Scott (1997). This enhances mastery of mathematical content and competence in the use of different strategies for solving mathematical problems.

Mathematical games outside classroom

There are games played by learners of mathematics. They have mathematical contents and the values of the games are based upon

the solution of a mathematical problem. Winning a game motivates students to solve the mathematical problems; UNESCO (1987) when playing, participants experiences excitement and elation; Heinich et al (1996).

Discussion of problem - solving or approaches

A general problem is a situation in which an individual wants to reach a goal but has not yet identified a means for reaching that goal; Horn (1995). Problem- solving then is identification and use of knowledge, skills, effective responses and behavioral activities in the achievement of the goal; Horn (1995).

There are three types of general problems. These are; problems that relate to social issues, un-structured problems and well - structured problems; Biehler & Snowman (1991).

According to Horn (1995), a mathematical problem has given information, obstacle and goal. He further explains that in order to solve mathematical problems effectively learners require to follow the five steps: Identification of a problem, understanding the nature of the problem (Problem framing reconstruction), recall of mathematical facts, formulation and implementation of solution to a problem.

Effective teaching of problem- solving process in mathematics involves encouragement of learners to generate their own explanation when worked examples are correct, represent problems, explain inductively principles underlying examples, create conducive problem- solving environments, use of group work and facilitate the formation of positive attitudes towards problem-solving and give clear and positive expectances to students: Horn (1995).

Worked out examples of mathematics problems.

Mathematics teachers provide worked sample problems to use textbooks provided examples with the hope that learner will determine the underlying principle or rule that governs the solution of the initial problem and transfer their learning to a new problem. The literature available indicates that learners face the obstacle of inability to understand why the underlying rule worked correctly in the given example and secondly their inability to use the underlying rule to a new problem; Mayer (1992).

To overcome the obstacle of understanding a worked example Horn (1995) proposed that mathematics teacher use appropriate method of teaching worked at examples such as. More teacher involvement rather than routine solution of problems, prompting learners to overtly describe their understanding of worked example, encouragement of learner talk a loud, require their understanding and give summaries of their understanding. This would evidence that they have obtained independent knowledge.

To help students use worked examples in the transfer of mathematical knowledge, Horn (1995) advised teachers to give adequate varied worked examples; reveal various complexities of the worked example, plan series of worked examples each with a new feature and require that students work out similar examples immediately. This enhances students' ability and transfer of learning to new mathematical problems. Sometimes mathematics teachers want students to solve a new problem by using what they already know about a related (analogous) problem.

To do this effectively, students have to go through these processes namely;

- (i). Identification or recognition of a rule that is applicable to the new problem
- (ii). Abstraction of some common elements in problems they know in the new analogous problem; and
- (iii). Application of known mathematical knowledge (Schema) directly to the new analogous problem- a problem that Horn (1995) refer to as mapping.

To help students acquire abilities in these processes mathematics teachers ought to do the following; Horn (1995): They should give hints and prompts; present more than one analogous example; point out similarities of a known problem and the new analogous; use teaching aids; reviews and direct advice; facilitate students' explicit practice; give immediate feedback; encourage inductive though and in general facilitate hands- on practice.

The variety of instructional approaches influence directly. Teachers handling of the instructional process affect students' values, interests and behaviors towards the learning of mathematics as stated by Oloyende (1996).

2.3. Mathematics Phobia

Calvin (1991) defined mathematics phobia as fear of numbers, whereby one is not mathematics illiterate but is afraid of dealing with numbers. It is neither a disease nor affliction. However it is a handicap that has a dramatic impact on ones life and inability to perform calculations in mathematics. Mathematics phobia will lower mathematics performance. Conquering mathematics phobia means gaining power in dealing with numbers.

2.4 Misconception of Aptitude for Mathematics

According to David (1996), there exist a category of students quite intelligent and are capable of demonstrating above average in a given subject requiring use of the same concepts. This ideology that some people are mathematics type while others are not, has made the teaching of mathematics appear paradoxical problem. This negatively affects performance in mathematics.

2.5 Nature of Mathematics

Mathematics is believed to be one of the difficult subjects to teach and learn. Cockraft (1982) attributes the difficult to its hierachial nature. According to Omulando (1992), mathematics is one of the compulsory subjects which is included in school curriculum. Its usefulness is seen to be of different kind from that of many other subjects in the curriculum.

According to Cockraft (1982) people believe that perception to usefulness of mathematics arises from the fact that mathematics provides means of communication which is useful and concise.

Shuard H & Quadling D. (1993) state that one must invoke an understanding of the structure of knowledge and inquiry within the particular subject matter discipline whose mastery is sought. If one perceives mathematics as basically a body of strategies, heuristics or method of inquiry, then clearly on approach to instruction calculated to optimize process of learning is most advisable. If mathematics is seen as a compendium of subject matter understanding an approach which optimize subject mastery would be preferred.

Johnson and Raising (1972) say that when we view mathematics as a way of thinking, we set its power in establishing logical thinking

according to spartial awareness. On the other hand life has been changing everyday and the curriculum has also been changing.

The nature has also changed. It has been wisely suggested that there are eight forces which influence and activate mathematical evolution, according to Grean (1982). Those are: - culture, stress both environmental and heredity, symbolization, diffusion in the anthropological sense, obstruction, generalization, consolidation and diversification, culture log and resistance, and a process of selection. These forces affect teaching and learning.

2.6 Attitude towards Learning of Mathematics

The major challenges faced in the learning of mathematics is lack of interest and the notion, the subject is too abstract. Njega (Daily Nation 12th October 1996 P 19) argues that mathematics is too abstract and the concepts taught are too readily experienced by pupils so that they take longer time to understand.

Pupils' attitude towards mathematics depends on many factors. At home parents may talk of mathematics positively or negatively depending on their previous experience. Children may develop the same attitude towards mathematics as their parent even before they go to school.

Lack of interest and self-confidence has resulted to negative attitude towards mathematics among learners of mathematics. Positive attitude contributed a lot in learning of mathematics. Learners get motivated when they find a subject interesting.

In school teachers are responsible of developing positive attitude in all the pupils towards mathematics. However, some teachers may also have a negative attitude towards mathematics. According to

(Daily Nation 12th October 1996) learners negative attitude towards mathematics is due to lack of practice and harsh teachers who make them hate the subject.

When pupils get good marks in mathematics or complimentary remarks for correct answer and for good work, they tend to like mathematics. According to Gean (1982), a pupil's attitude towards mathematics is an amalgamation of attitude to specific factors of mathematics which can be recorded on a scale ranging from strong disapproval.

Many pupils develop myth that mathematics is a difficult subject. They are stereotyped that mathematics subject can only be tackled by gifted learners. Denies (1960) argued that mathematics as we all know is not a popular subject. He said that mathematics is generally regarded as difficult and tricky except in a few isolated cases where enthusiastic teachers have infused into the subject making it exciting and so less difficult. This makes the learners of mathematics to be interested and motivated.

Eshiwani (1982) noted the existence of the extreme lack of self confidence often termed as mathematics anxiety or mathemaphobia among girls than boys. Most of the girls have less favorable attitude towards mathematics than boys.

2.7 Teaching and Learning Resources

In adequate teaching and learning resources has also teaching of mathematics. According to Kaleaiye A.O. (1985) a learning resource is something that will facilitate or motivate children's learning. Farrant (1980) says that because of insufficient practical training, many teachers do not recognize the potential of many simple

teaching aids available at very little cost or how to use them to the full even when given them.

On the other hand choosing of textbooks should be appropriate. Das (1985) states that in selecting on appropriate textbooks, the following should be considered:- the content should be appropriate to the age level of the learners and conform to the syllabus. Topics should be illustrated with diagrams, pictures, charts and graphs to make them easy to understand. The subject matter should be arranged in a psychological sequence to make the subject more meaningful to learners. The topic should lead learners to experimentation and should also suggest projects. The covering should be easy and within the level of comprehension. The classroom teacher needs to have knowledge of the available text books in a subject and should guide the pupils accordingly so that they can read the relevant topics.

2.8 Teachers qualification and in-service training for teachers

Mathematics is a subject that needs a lot of care when handling it. Mathematics syllabus needs to be interpreted properly and the scheme of work be drawn in the correct way. Methods of teaching need to be chosen well. All this needs a qualified teacher who is ready to translate the specification of the syllabus into more detailed plan. As Cockraf(1992) noted, mathematics is hierachial in nature and teachers must teach it in such a way that each proceeding learning lays foundation for the succeeding learning experience. Competent teachers are needed to tackle mathematics in the right way.

Many teachers were trained long ago making it impossible for them to cope with the curriculum development which is changing now and

then. If new curricula are to be compulsorily introduced to schools, attendance of in-service training courses should not be left to the keen teachers who volunteer. Every teacher should go for the course. According to Farrant (1980) curriculum development and in-service training are opposite sides of the same coin and it is impossible to have the former without the later,

Large number of schools with teachers who have received in-service training lead to ignoring of modern education research findings in formal teaching. The design for schools and limited resource allocated many of them compel teacher to use teaching methods which are much less efficient than those that could be useful if resources were better; this is according to Kalejaiye D.A.O. (1998).

A number of teachers are forced by circumstance to teach mathematics in primary schools. Tracing from their background they did not perform well when they were in primary school or secondary school. Others have no interest in the subject.

2.9 Mathematics Syllabus

The mathematics syllabus refers to a condensed outline of topics or statements of all the main points of a course of a study to be covered within specified time. The content to be covered is broken down on a yearly basis for a total of eight years. Teachers now and then have blamed the poor performance in mathematics on a loaded syllabus which makes them rush over some demanding topics.

Some researchers and scholars have criticized the syllabus. Fraser (1972) says that syllabus tend to be vague and often gives the impression that the education is primarily concerned with covering topics. It should be noted that syllabus does not indicate the depth

of coverage. The teacher therefore is expected to translate the syllabus.

Group work is very essential when teaching mathematics but lack of time make teachers not to utilize it properly. The syllabus has been reviewed now and then but still teachers complain that it is overloaded. According to Farrant (1980) the syllabus is left general, consisting of a series of topics to be learnt. Teachers are left to interpret the syllabus.

2.10 Motivation

Motivation factors mostly seem to fall naturally in two groups. These are Biogen motives (hunger and pain avoidance) which have a very marginal relation with learning and socio-genic motives (group membership and expectation of success) which have a very direct relevance to good learning. This is according to Hersee (1976). Their apparent importance may be judged by the well founded view that the level of a students' performance is 50 percent the result of difference in the ability and 50 percent the results of differences in the strength of motivation. Success experienced by teachers or pupils is a major factor in mathematics education. Success motivates people and failure disheartens them.

There are two types of motivation namely; extrinsic and intrinsic motivation. Extrinsic motivation comes from outside the individual while intrinsic motivation comes from within the individual.

Extrinsic motivation usually takes the form of rewards and punishment for certain kinds of behavior. Satisfaction of curiosity and interest serve as intrinsic motivation for intellectual activity.

A mathematics learner requires both extrinsic and intrinsic motivation. A pupil requires a lot of encouragement from their teachers, parents, peers and friends. Kenya National Examination Council (KNEC) and the Ministry of Education argued that teachers failed to motivate their pupils to take an interest in the subject. Most of them do not communicate effectively with their pupils who become lost and end up hating the subject (Daily Nation 12th October 1996 pg 13).

Effective instruction can only occur when pupils are motivated to learn and the instructor is motivated to teach. By providing pupils with incentives, interest is created in them and their attention captivated. Attentive pupils will concentrate better during the classroom proceedings leading to effective learning.

In learning, the ultimate determiner of persuasions is not a message itself but what it triggers. When a message is important to its listeners, they will not soak it up but will mentally agree or counter argue. The French Mathematician Blaise Pascal observed that "people are usually convinced by reasons they discover themselves than those found by others." Others say that when a message evokes the desired sort of thoughts, it becomes even more persuasive if technique used are used to the audience thinking about.

According to Oliver (1964), a pupil of high but weak motivation is at much poorer risk than one of mediocre ability and powerful motivation. Desire for praise, success in competitive situation, promotion, group appreciation, the approval of the teacher and parent are examples of motives which from time to time influence the attitude of pupils towards the work of a classroom.

2.11 Teaching of Slow Learners

This is a group of learners which is sometimes neglected when learning due to various reasons. There is need to understand and improve mathematics education of low ability pupils and others who have special educational needs. According to Gean (1982) when these pupils attend ordinary schools, they probably receive special attention either as isolated pupils in mix ability classes.

Teachers discover that some of the pupils are unable to do mathematics because they have a personal aversion to mathematics and so the teachers to these pupils must start by trying to correct the aversion which may not do very well due to the large number of pupils in the class. All in all teachers should strive and see to it that the pupils get the mathematical concepts well. Methods like group work should be utilized properly to help this group of learners.

2.12 Mathematical Language

Some researchers view mathematics as language in itself. According to Demson (1994), it is a kind of condensed language with international currency. Those who teach mathematics understand mathematical language to mean a language which conveys mathematical concept and message. This is done through the use of symbols as all understand, just as there are alphabets in other languages. However, mathematical language is more than its symbols as words as used in a mathematical sense.

Clenson (1994) says that reading and comprehension of words in mathematics also cause mathematics misunderstanding. Children may make errors in reading words such as "angle" for angle and "minute" for minus. Confusion can also arise for certain spoken words in terms of their punctuation for example "ten" and "tenth".

According to various researchers, the appropriate language to teach mathematics is the language the learners' best understand. This could be mother tongue in mathematics, kiswahili in mathematics or English in mathematics. This is according to Shuard H & Rothery A. (1993). If children learn mathematics through English when they have not yet mastered this foreign language they do face a lot of difficulties. They continue to say that difficulties are caused by children failing to comprehend mathematical words. This is because many of the words only occur in mathematics lessons. Children cannot look them up as only a few school texts have glossary. However defining words does not guarantee comprehension.

2.13 Psychology of Mathematics Education

Piaget's theories were first applied in Britain primary schools. When a young child is learning mathematics, he has to develop concept of number space. Piaget showed that this intellectual development passes through five qualitatively different stages and teachers must provide suitable work which builds on experience from the earlier stages.

According to Manson J. (1996) some children will never reach the final stage for the entire mathematical concept which they learn.

Jerome Bruner also agrees with sequential stages of intellectual development which Piaget claims. One important aspect of Bruner's belief is participation through learning by discovery. He is not satisfied with pupils learning a body of mathematics knowledge. He also wants them to think like mathematician, Hughes M. (1995).

2.14 Mathematics in Relation to Curriculum

According to Farant (1980) the word curriculum refers to all that is taught in school including time tabled subjects and all those aspects of its life exercise which are an influence in the life of children.

There has been in recent years a great deal of curriculum change going on all over the world. This has been due to new concept of knowledge. Thus new mathematics has emerged as a new way of looking at numbers and revolutionized the curriculum offered for traditional mathematics and new discoveries in psychology have encouraged new methods such as programmed learning and resource based learning.

Main changes have been due to changes in society itself which have made former curricular hopeless and irrelevant. This has been particularly so in Africa where the curriculum inherited before independent was often geared to European society.

The curriculum change not only alters content of the curriculum but the method by which it is taught. This has particular significance for the teacher because it may change his role completely. A traditional teacher-pupil relationship, the teacher teaches the whole class as a unit. However, when individualized learning is introduced and each pupil works at his own pace. The teacher who was trained many years ago will be able to manage to play a completely different role from which he was originally trained.

2.15 Recreational Mathematics

Recreational mathematics is the agreeable occupation of time with games, problems as puzzles which have a mathematical content. This activity is in accord with Professor Geoffrey Mathews remarks in his (1978) presidential address to the mathematics association

that within a curriculum it is forbidden not to waste time. That means that young mathematicians must not be so busy that they have no time for mathematical contemplation and reflection. This recreational mathematics will be the most effective if it is integrated into the curriculum for most pupils.

2.16 Classroom Environment

Many aspects of behavior are apparently conditioned in very considerable degree by the kind of environment in which the individual lives.

In order to create a conducive learning environment in a classroom, Ayot (1992) recommended that the teacher must be well prepared and should be able to handle the subject with confidence. He must be able to raise pupils' curiosity in the subject.

To enrich the classroom environment, basic facilities such as text books and writing materials should be provided to the learners. This makes the learning easier and enjoyable. Care should be taken by the teacher about individual differences in the learners. He should ensure healthy interaction with every student and after necessary guidance, sympathy and encouragement during the lesson. As Shiundu & Omulando (1992) observe "A teacher who is interested in improving the pupils' performance cannot afford to ignore any of the pupils in class. He may try to motivate the student facing and convincing him/her to work hard."

2.17 Learning Mathematics

The knowledge of the nature of learning leads to the conclusion that there must be order and sequence in the development of mathematical concepts as Mansion (1996) noted. Some of the major causes of difficulties in problem solving in mathematics are

mental-imaturity and mental defects, reading difficulties, lack of experience involving numeral relations, insufficient experiences involving simple mathematics problems, lack of skills in the fundamentals, poor teaching, carelessness and lack of motivation. Meanings are learned in actual situations. The concept of a function is easily developed in practiced situations. What pupils need is experiences in dealing with situation involving the idea rather than lengthy verbal statements that in themselves need explanation.

Lack of method of attack is an important cause of failure in problem solving in many topics such as geometry. Most pupils need some selective direction in the organization of their attack upon a problem situation. The dull pupils will profit most from such direction.

2.18 Conclusion

Quite a number of teaching methods and factors that lead to poor performance in mathematics have been cited in reviewed literature. The researcher therefore seek to find out whether the mentioned factors are the same that leads to challenges and poor performance in mathematics in public primary schools in Shamata zone in Nyandarua District, Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This section looks at the methods and procedures used in collecting information concerning the study of methods of teaching mathematics in regular primary schools in Shamata zone. The chapter contains research design, population studied, sample population, sampling procedure, research instrument and data analysis methods.

3.1. Research Approach

The approach used in this research was both quantitative and qualitative approach of which data collected is expressed in numerical order as well as in words.

3.2 Research Design

To collect information, survey method was used. The researcher selected some schools and sent questionnaires to collect the data

3.3 Population

The population used consists of teachers from Shamata zone in Nyandarua North District, Kenya. Only the public school teachers were involved. The zone has 28 schools with 200 teachers, 20 teachers were the respondents.

3.4 Sample

The researcher selected few teachers from Shamata zone. The researcher used 10 schools in the zone. The schools selected were represented by 2 teachers.

3.5 Sampling Procedure

The researcher used purposive sampling whereby own judgment was used to select schools from a list of schools in the zone. The researcher further selected the teachers who teach mathematics to be the respondents.

3.6 Instruments/Tools

Questionnaires were used in the research. They were used to assist the researcher cover a wide area and therefore reach many respondents to give information within a short time.

The researcher pre-tested the questionnaire to check the reliability and validity of the tool.

3.7 Data Analysis

After the questionnaires were filled and received back, the researcher analyzed the data quantitatively and qualitatively through the use of tables, frequencies and percentages.

CHAPTER FOUR

PRESENTATION AND ANALYSIS

4.0 Introduction

This chapter is dealing with presenting and analyzing of data from the information given by the respondents. Tables, frequencies and percentages are used in this presentation. The researcher used quantitative and qualitative method when analyzing the research questions.

Table 1: Name of schools according to distribution of questionnaires.

DISTRICT	SCHOOL	SAMPLE TEACHERS
NYANDARUA NORTH		
	MUTI-UMWE	2
	KANYAGIA	2
	SUBUKU	2
	MAKEREKA	2
	SIMBARA	2
	WARUKIRA	2
	KAHEHO	2
	MWIHANG'IA	2
	KANGOCHO	2
	PESI	2
TOTAL		20

The table above shows the schools selected and the number of respondents each school had. In total there were 20 respondents from 10 schools. All the selected teachers responded. This is 100% response.

Table 2: Gender

Category	Frequency	Percentage
Male	13	65
Female	7	35
TOTAL	20	100

Out of the 20 respondents who responded to the question regarding their gender, 13 are male teachers which are 65% while 7 are female that is 35% of the total.

Table 3: AGE

Category	Frequency	Percentage
20-30yrs	0	0
31 – 40 yrs	11	55
41 – 50 yrs	9	45
Over 50 yrs	0	0
TOTAL	20	100

From the table 55% of the respondents are of the age between 31 – 40 yrs. 45% are of the age between 41-50 years.

This information shows that majority of teachers are within the age 31-40 years while others are between 41-40 years.

Table 4: Level of Education before Training

Category	Frequency	Percentage
"O" Level	16	80
"A" Level	4	20
Other (Specify)	0	0
Total	20	100

Out of the 20 respondents, 16 attained "O" level education; this is 80% of the total. 20% of the respondents had "A" level education.

From this information, majority of the teachers went up to "O" level status. Very few did "A" level.

Table 5: Professional Qualification

Category	Frequency	Percentage
P1	6	30%
AT IV	9	45%
Diploma	3	15%
Degree	2	10%
TOTAL	20	100%

From the table above 45% are AT IVs, 30% are P1 teachers, 15% are Diploma while 10% have attained degree level.

This shows that majority of the respondents teaching Mathematics have been promoted to AT IV status. Others are still in P1, status while others have gone for further studies and attained Diploma and degree status.

Table 6: Teaching experience

Category	Frequency	Percentage
1 – 5 yrs	0	0
6 – 10 yrs	1	5
11 – 15 yrs	9	45
Over 15 yrs	10	50

The respondents who taught for more than 15 years are 50%. 45% have taught between 11 – 15 years. 5% of the totals have taught between 6 – 10 years.

From the information above half of the respondents have over 15 years teaching experience. However there are those with 11 – 15 years teaching experience while only one has 6 – 10 years teaching experience.

Table 7: The average number of pupils per class in respondents' schools

Category	Frequency	Percentage
25	4	20
40	8	40
50	6	30
60	2	10
TOTAL	20	100

From the table above 40% said that their schools have 40 pupils per class. 30% stated that they have 50. 20% indicated that they have 25 while the rest 10% said that they have 60 pupils per class in their school.

From this information it shows that most of the schools have 40 and above pupils per class.

Table 8: Number of lessons the teacher take per week

Category	Frequency	Percentage
30	2	10
35	8	40
38	4	20
40	5	25
45	1	5
TOTAL	20	100

Out of 20 respondents 40% pointed that they teach 35 lessons per week. 25% said that they take 40 lessons. 20% mentioned that they have 38 lessons. 10% indicted that they have 30 lessons while 5% had 45 lessons per week.

This shows that majority of the teachers teach 35 and above lessons per week.

Table 9: Showing of interest in learning mathematics among boys and girls

Category	Frequency	Percentage
Boys	13	65
Girls	4	20
Both	3	15
TOTAL	20	100

Out of 20 respondents 65% stated that boys show more interest than girls 20% said that girls show more interest than boys, while 15% had mixed feelings and said that both boys and girls have equal interest.

From this information it shows that majority indicated that boys show more interest than girls in learning mathematics.

Table 10: General attitude of learners towards mathematics

Category	Frequency	Percentage
Very interested	0	0
Interested	2	10
Fairly interested	12	60
Not interested	6	30
TOTAL	20	100

From the information above 60% pointed out that pupils are fairly interested in Maths 30% said that pupils are not interested while 10% indicated that pupils are interested in maths.

Table 11: Whether pupils are properly motivated in schools

Category	Frequency	Percentage
No	8	40
Partly	6	30
Yes	6	30
TOTAL	20	100

40% of the respondents said that pupils are not motivated properly in their schools. 30% said that they are partly motivated. The remaining 30% felt that they motivate their pupils properly.

This information shows that majority of learners are not motivated properly.

Table 12: Whether schools have adequate mathematics textbooks and other learning resources related to mathematics

Category	Frequency	Percentage
Yes	18	90
No	2	10
TOTAL	20	100

90% of the respondents felt that their schools have enough text books and other learning resources related to mathematics. Only 10% said that they don't have enough.

Table 13: Whether learning aids are used properly in schools

Category	Frequency	Percentage
To some extent	17	85
Yes	2	10
No	1	5
TOTAL	20	100

From the table above, 85% of the respondents advocate that they use learning aids to some extents. 10% said that they use them properly while 5% felt that they are not used properly.

This information shows that majority of teachers don't use the learning aids properly but to some extent.

Table 14: Feeling of teachers when handling mathematics

Category	Frequency	Percentage
Positive (like and enjoy)	6	30
Negative (Dislike and low morale)	6	30
Difficult to handle	4	20
Very involving and tiresome	2	10
Fear teaching	2	10
TOTAL	20	100

According to the table above, 30% of the respondents have positive feelings, they like and enjoy mathematics. Another 30% said that teachers have negative attitude. 20% felt that Mathematics is difficult to handle. 10% said that Mathematics is very involving and tiresome and another 10% fear teaching mathematics.

According to this information, very few teachers show positive attitude. The majority have a negative one.

Table 15: Types of questions which pupils perform poorly

Category	Frequency	Percentage
Story (word) problems	13	65
Measurement	3	15
Algebra	1	5
Geometry (Construction)	1	5
Combined operation	1	5
ALL	1	5

According to this table 65% of the respondents said that pupils perform poorly in questions which are written in story form i.e. word problems. 15% mentioned measurement. Algebra, geometry (construction), combined operation and "ALL" were mentioned by 5% of the respondents each. This shows that majority perform poorly "word" problems due to language barrier.

Table 16: Why Mathematics is performed poorly in public regular primary schools

Category	Frequency	Percentage
Negative attitude	6	30
Time and syllabus coverage	4	20
Resources and poor teaching methods	4	20
Understaffing	2	10
Language used in testing	2	10
Lack of parent support	1	5
Lack of motivation	1	5
TOTAL	20	100

According to the table above 30% of the respondents cited negative attitude as the one which leads to poor performance in Mathematics. 20% stated that time and syllabus coverage as factors. Another 20% said resources and poor teaching methods are the causes. 10% noted the understaffing of teachers and another 10% said that language used is not appropriate sometimes. 5% mentioned lack of parent support. Finally 5% of the respondents advocate lack of motivation as a reason.

Table 17: Extent of the use of the following teaching methods to the learners

Category	Frequency	Percentage
Question and answer	5	25
Demonstration	4	20
Discussion	3	15
Lecture	3	15
Investigatory	2	10
Project wok	1	5
Discovery	1	5
Mathematical games	1	5
TOTAL	20	100

From the above table it shows that 25% of the respondents use question and answer method while teaching mathematics. 20% uses demonstration, 15% uses discussion. Another 15% uses lecture method. 10% use investigatory method. Project work, discovery and mathematical games are used by 5% each.

Table 18: Are teaching methods that teachers used in schools have any impact on the performance of mathematics?

Category	Frequency	Percentage
Strongly agree (SA)	8	40%
Agree (A)	7	35
Undecided (UD)	3	15
Disagree (D)	1	5
Strongly disagree	1	5
TOTAL	20	100

According to the information above 40% of the respondents strongly agree that teaching methods that teachers use while

teaching mathematics have impact in academic performance. 35% agree on the same. 15% feel undecided. 5% disagreed while another 5% strongly disagreed.

From the information given it is clear those majorities strongly agree or agree that teaching methods have impact in academic performance in mathematics.

Table 19: The difficulties that teachers undergo when teaching mathematics in schools

Category	Frequency	Percentage
Heavy teaching load	6	30
Inadequate resources and facilities	5	25
Discouragement by society	4	20
Lack of motivation	3	15
Negative attitude	1	5
Improper arrangement of topics	1	5
TOTAL	20	100

The respondents gave out various difficulties that they undergo when teaching mathematics. 30% cited heavy teaching load due to understaffing. 25% said inadequate resources and facilities. 20% pointed out discouragement by society. 15% talked about lack of motivation towards teachers. 5% said negative attitude from all corners contribute to the difficulties and another 5% pointed out that improper arrangement of topics in mathematics syllabus is another difficulty that brings about the difficulties.

Table 20: Suggestions on ways of improving pupils performance in mathematics and solving the encountered difficulties in schools

Categories	Frequencies	Percentage
Motivation of pupils and teachers	4	20
Addition of resources and facilities	3	15
More staffing	3	15
Using the varieties of teaching approaches	3	15
Parent involvement	2	10
Teacher-pupil and society encouragement towards mathematics	2	10
Remedial teaching	2	10
Maths and English teachers to co-operate	1	5

The respondents gave different suggestions on ways of improving pupils' performance and solving the difficulties encountered by teachers in reference to their schools. 20% of the respondents suggested that teachers and pupils should be motivated well. 15% suggested addition of resources and facilities. Another 15% said that due to the shortage of teachers, the government should add more teachers in the staff. 15% also suggested that teachers should employ varieties of teaching approaches when teaching. 10% commented on parent involvement. Another 10% suggested that teacher-pupil and society encouragement towards mathematics should be enhanced. 10% of the respondent also suggested that there should be remedial teaching. Finally, 5% of the respondent said that mathematics and English teachers should co-operate due to language barrier encountered by learners.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This is the last chapter of this research paper. It highlights the summary, conclusion and recommendations based on findings.

5.1 Summary

This chapter briefly gives discussion, conclusion and recommendations of the research study about methods of teaching mathematics and academic performance of learners in regular primary schools in Shamata zone Nyandarua District, Kenya. It is derived from the literature review from various books the researcher went through and finally got views from respondents from the area of Shamata of which he later analyzed.

5.2 Discussion

The findings the researcher has come up within this report may pave way for future research to help better performance in Mathematics.

Teachers in public regular primary schools should be frustrated by the challenges they encounter when handling mathematics. They should not get tired or be frustrated when the results are out.

Teaching methods have great impact on academic performance in mathematics. This is according to the findings in this research. In support of this view, Oloyende (1996) stated that the variety of instructional approaches influence directly. He also said that teachers' handling of the instructional process affects students' values, interests and behaviors towards the learning of mathematics. According to Hamachek (1995) a purely a single

method of teaching is not effective in the teaching of mathematics at any level. Therefore, teachers should vary their methods of teaching for a better performance.

According to the findings teaching methods are not the only hindrance to good performance in mathematics. There are quite a number of factors that affect learning of mathematics. Teachers also face various difficulties when teaching mathematics.

Teachers should help learners to acquire positive attitude towards mathematics. Table 10, views of respondents on general attitude of learners towards mathematics shows that learners have negative attitude towards mathematics. In support of this view Denies (1960) argued that mathematics as we all know is not a popular subject. He regarded mathematics as a difficult subject. Quite a large number of respondents were of this view. They indicated that their learners are either fairly interested or not interested in maths. Difficulties as well as lack of interest may be noted due to lack of proper approach. With the right approach learners may change their feelings.

The research has shown in data analysis that teachers experience some difficulties when teaching mathematics in public primary schools. The problem encountered include heavy teaching load due to large number of pupils per class. According to table 7 on the average number of pupils per class, most of the schools have 40 and above pupils per class. This leads to teachers not able to pay attention to individual differences. This is against Shiundu and Omulando (1992) wish, as they observed that a teacher who is interested in improving the pupils performance cannot afford to ignore any of the pupils in class.

When learners are in large number, it is difficult to reach all of them though other methods should be utilized e.g. group work.

Teachers also face another problem of having many lessons per week, leaving inadequate time for lesson preparation. According to table 8 on lessons taught per week, it shows that majority of teachers teaches 35 and above lessons per week.

From data analysis respondents indicated that there are various types of mathematics questions that pupils perform poorly. These are story (word) problems, measurement, algebra, construction in geometry and combined operation. "Story problems" was quoted by many respondents, of which they cited the language used as the hindrance. This is in table 15.

According to Shurand H. and Rothery A. (1993), many of the difficulties for children reading mathematics are caused by children failing to comprehend mathematical words. Indeed many learners have difficulties in understanding such problems due to the language used in the exams of which is written in English.

Other challenges apart from negative attitude understaffing and language used in testing are: Time and syllabus coverage, resources and poor teaching methods, lack of parent support and lack of motivation, discouragement by society and improper arrangement of topics. This is as in table 16 and 19 dealing why mathematics is performed poorly in public regular schools and the difficulties that teachers undergo when teaching mathematics in schools. All these challenges unless they are taken care of will continue affecting the performance in mathematics.

5.3 Conclusion

There are various findings of this study on methods of teaching mathematics and academic performance of learners in regular primary schools. Teachers clarified on the extent they use various teaching methods they apply in mathematics to their learners. They also gave their views on why mathematics is performed poorly. They further gave suggestions on how this situation can be dealt with. The teachers noted that there is gender disparity in mathematics. Boys are said to have more interest in the learning of mathematics than girls. On attitude towards mathematics, respondents said that learners are not very much interested in mathematics. Many learners say they are either fairly interested or not interested. Teachers' feelings when handling mathematics was also visited. Less than half of the teachers have positive attitude.

Others view mathematics in different ways. They have negative attitude; say it is difficult to handle, very involving and tiresome while others fear it.

Learners encounter difficulties in story (word) problems, measurements, algebra, geometry and combined operations. Respondents also claimed that parents do not make follow up on their children's performance in mathematics.

According to the findings teachers are overloaded due to understaffing. They also face problems of inadequate resources and facilities. There is also the discouragement by society as well as lack of motivation. The findings also conclude that there is improper arrangement of topics of which should be from simple to complex and follow the right sequence.

After giving their challenging part, the respondents suggested their recommendations such as motivating pupils and teachers, addition resources and facilities, more teachers should be employed, teachers to use varieties teaching approaches, parents should be involved in handling of their children, teacher-pupil and society encouragement towards mathematics, there should be remedial teaching and Maths and English teachers to co-operate especially in improving the new language. When all the recommendations are implemented in full, respondents hoped that public regular primary schools should perform just like their counter part private schools.

5.4 Recommendations

In view of research on methods of teaching mathematics and academic performance of learners in regular primary schools in Shamata Zone, Nyandarua District, Kenya, the researcher recommended the following:-

There should be in-service training courses and every teacher should go for the course. This is for the teachers to familiarize themselves with various new teaching approaches being introduced. The training may help teachers to acquire knowledge, skills and attitude of handling learners with special needs in education. The government should implement it. Teachers may be attending the course after the schools close.

Learners' individual differences should be taken care of. Teachers have to attend each accordingly. This should be done during the learning session or during free time.

Remedial teaching should be done now and then. This should be done by teachers or any other knowledgeable person. It should be done after identifying the problem.

Proper motivation of learners be applied. Teachers should motivate the pupils to better the performance. This should be done always at school and in their homes.

Government should motivate teachers. This is by providing attractive terms of service for all teachers.

Parents must be involved in their children education and their well being. They should co-operate with teachers in all areas.

Teaching and learning resources should be provided adequately. Teachers should use the resources properly. Government is the one to provide as usual with the help of the well wishers.

Government should employ more teachers for provision of quality education. This can reduce the large number of pupils being attended by one teacher.

Curriculum should be modified to suit all learners. This can be done by curriculum developers. The teachers should implement it.

Use of English language should be emphasized in schools. Teachers should make sure that their pupils always communicate in English. This may help the learners to understand mathematical language properly.

Team teaching should be implemented. Teachers should work as a team to improve the standard. They should be consulting one another in case of problems.

Importance of mathematics in day to day life be sensitized to the society. This will lead to teacher, student and society

encouragement towards mathematics. Teachers and other stakeholders should implement it.

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APPENDIX I: TEACHERS' QUESTIONNAIRE

SECTION A:

BACKGROUND INFORMATION

Please answer all questions in this section by putting in the provided box and fill in where necessary.

1. Name of the school:

2. Gender: Male ☐ Female ☐

3. Age: 20 – 30 yrs ☐ 31 – 40 yrs ☐
41 – 50 yrs ☐ Over 50 yrs ☐

4. Level of education before training:
"O" Level ☐ "A" Level ☐
Others (specify) _____

5. Professional qualifications
P1 ☐ ATS IV ☐ Diploma ☐
Graduate ☐

6. Teaching Experience: 1 – 5 yrs ☐ 6 – 10 yrs ☐
11 – 15 yrs ☐ Over 15 yrs ☐

7. What is the average number of pupils per class in your school?

8. How many lessons do you teach per week?

SECTION B

Please put a tick in the appropriate box and fill in where necessary

9. In your school, who among the boys and girls show more interest in the learning of mathematics?

Boys ☐ Girls ☐ Both ☐

10. What is the general attitude of your learners towards Mathematics?

Very interested ☐ Interested ☐ Fairly interested ☐
Not interested ☐

11. Are pupils motivated properly in your school?

.....

12. Does your school have adequate mathematics text books and other learning resources related to mathematics?

.....

13. Are learning aids properly used in your school?

.....

14. What are the feelings of teachers when handling mathematics in your school?

.....

15. What types of mathematics questions do pupils perform poorly in your class?

.....

16. In your own opinion, why is mathematics performed poorly in public regular primary schools?

.....

17. To what extent do you use the following methods in teaching mathematics to your pupils?

- | | |
|---------------------------|----------------------|
| (i) Question and answers | <input type="text"/> |
| (ii) Lecture | <input type="text"/> |
| (iii) Discussion | <input type="text"/> |
| (iv) Project work | <input type="text"/> |
| (v) Investigatory | <input type="text"/> |
| (vi) Demonstration | <input type="text"/> |
| (vii) Discovery | <input type="text"/> |
| (viii) Mathematical games | <input type="text"/> |

18. Do teaching methods that teachers use in your school have any impact in academic performance in mathematics?

Strongly Agree (SA) Agree (A)

Undecided (UD)

Disagree (D) Strongly disagree (SD)

19. What are the difficulties that teachers undergo when teaching mathematics in your school?

.....

20. In your own opinion suggest ways of improving pupils performance in mathematics and solving the encountered difficulties in reference to your school?

.....
.....
.....
.....

APPENDIX II: TRANSMITTAL LETTER

**KAMPALA INTERNATIONAL
UNIVERSITY P.O. BOX 2000
KAMPALA**

DATE:

TO WHOM IT MAY CONCERN

REF: RESEARCH

I, DANIEL GACHIHI TUCHURA ADM NO. BED/14959/62/DF, a student in Kampala International University wish to conduct a research on methods of teaching Mathematics and academic performance of learners in regular primary schools in Shamata Zone, as partial fulfillment of the requirement for the award of a degree in Special Needs Education.

I kindly request you to accord me the necessary help I may require to accomplish the assignment.

Thanks in advance.

Yours faithfully,

**Daniel Gachihi Tuchura
BED/14959/62/DF**

