

**IMPACT OF TEACHING METHODS ON PUPIL'S PERFORMANCE IN
MATHEMATICS, MERU- SOUTH DISTRICT**

**BY
MONICAH NJERI NJOROGE
BED/21171/81/DF**

**A RESEARCH PROJECT SUBMITTED TO THE INSTITUTE OF OPEN
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DECLARATION

I MONICAH NJERI NJOROGÉ, declare that this research project is my original work and has never been submitted to any university for any award. Where the work of others have been cited acknowledgement has been made.

Signature.....*Mu*.....

Date.....*10/4/2010*.....

MONICAH NJERI NJOROGÉ


BED/21171/81/DF

APPROVAL

I certify that the work submitted by this candidate was under my supervision. Her work is ready for submission, to be evaluated for the award of a bachelor of education (ECPE) at Kampala international university.

Supervisor: CISSY SSENTAMU

Date.....19/4/2020.....

Signature..........

DEDICATION.

I would like to dedicate this research to my family for the assistance in compiling the materials for research.

ACKNOWLEDGEMENTS.

My gratitude goes to my supervisor for the advice and guidance while I was writing this project and also for providing useful references in order to improve the quality of this project.

I cannot forget my pupils and colleagues for their valuable contribution to this paper.

To them I say thank you.

DEFINITION OF KEY TERMS

Academic performance- achievement and performance of learners in school

Teaching methods- tactics and approaches used to teach pupils in school more especially in mathematics so that they understand better and therefore perform well.

Gender- the fact of being male or female in sex.

Disparity- a difference especially one that is caused by unfair treatment.

Respondent – a person who answers questions especially in a survey.

Response- an answer or reaction

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Acronymes

MOEST: Ministry of Education Science and Technology

**UNESCO—United Nations Educational Scientific and Cultural
Organizational**

NCTM: National Council of Teachers of Mathematics

IQ- Intelligent Quotient

ABSTRACT

The purpose of the study was to investigate the impact of teaching methods on pupil's performance in mathematics in Meru south district Kenya. The specific objectives of the study were; to determine the various types of teaching methods and their effect on performance of learners in mathematics, to investigate the hindrances to effective teaching of mathematics and to determine gender differences that exist in the performance of mathematics in Meru South district Kenya. The methods used for data collection were questionnaires to the pupils and interviews with the parents.

The study revealed that Problem-Oriented Curriculum, corporative group work or collaboration, demonstration, .discussion and questioning were some of the teaching methods used by teachers in teaching mathematics. The study revealed that the hindrances to effective teaching of mathematics were use of unqualified and un trained teachers, use of poor teaching methods, lack of learning resources among others. The study revealed that that gender differences in mathematics are caused by girl 's bad attitudes towards the subject, society 's attitudes towards girls and mathematics all these contribute to differences in performance between girls and boys.

The government should construct facilities at school for mathematics teachers to teach in a conducive environment in order to aid the better performance of mathematics to pupils in their schools. The government should have a policy in place that encourages the taking up of mathematics subject especially to the female students who at times think they are not good enough for the subject. The girl child should be encouraged to relate equally with boy in all subjects regardless of whether it is mathematics or not. The community should be sensitized to encourage girls to perform well in the subject other than telling them

that mathematics is for boys. Teachers should use effective methods in teaching the subject and only qualified teachers should be used or employed to get better grades.

CHAPTER ONE;

1.0 INTRODUCTION

1.1 Background of the Study

Teaching mathematics in today's world requires practices and procedures integrated with performance tasks that actively involve students. More pupils in secondary schools are still finding it difficult to see mathematics as an easy subject, contrary to what some mathematicians say. In their desire to study science-related subjects and take after their doctor and engineer idols, they have often been discouraged by their inability to understand the intricacies of calculation. Sunday Ojeme (2007)

Over the past decades, mathematics instruction has undergone a "reform" movement that emphasizes critical thinking, communication, and collaborative learning over rote memorization or application of formulas, procedures, and basic skills. Analogously, a new set of teaching methods focusing on these goals has been labeled "effective mathematics instruction. Zemelman, Daniels, and Hyde (1998)

The teaching methods and strategies that constitute effective teaching of mathematics depend on one's definition of "mathematics." If school mathematics is merely a collection of formulas, rules, and procedures that must be memorized and mastered, then many traditional teaching techniques like drilling, individual worksheet practice, and flashcards could be considered effective. However, the current definition emphasizes that mathematics is an integrated whole, a study of structures and the relationships between things, and a way to study and understand the world around us. The goal of teaching. Mathematics is changing too. Now teachers need to help students develop the skills they will use every day

to solve mathematical and non-mathematical problems, which include the ability to reason, to explain and justify ideas, to use resources to find needed information, to work with other people on a problem, and to generalize to different situations, as well as the traditional ability to carry out computations and procedures. Zemelman, Daniels, and Hyde (1998) describe the math teacher's goal as "helping] all students develop mathematical power." This mathematical power allows a student to feel mathematics is personally useful and meaningful, and to feel confident that he or she can understand and apply mathematics

In Kenya about 10% of the children like and are willing to study math. The rest have to be persuaded or forced to study mathematics because it is compulsory Republic of Kenya (1999). They have a completely negative attitude towards the subject (especially the girls). The main reason for these problems is that up to the late 1970s, nobody chose to go to the university to study education as a profession. The good mathematics students studied engineering, medicine, accounting, or any other course but teaching. Many of those who failed to meet the minimum requirements for their preferred careers became teachers. Such mathematics teachers tended to scare the learners to cover up their lack of content knowledge and their inadequate preparation to teach the lessons. SahaL.J (1983).it is upon this background that the study was under taken.

1.2 Statement of the Problem

Mathematics is a very important subject that is needed in every day life however; most learners see it as a difficult subject which is sometimes hindered by other factors like lack of teaching materials and trained teachers. For learners to perform well they need to be taught using methods that help them understand the subject. However the factors

mentioned above hinder the effective teaching of mathematics and hence need for the study

1.3 Objectives of the Study

1.3.1 General: This study was set to investigate the impact of teaching methods on pupil's performance in mathematics in meru south district Kenya.

1.3.2 Specific objectives

This study sought to:

1. Determine the various types of teaching methods and their effect on performance of learners in mathematics in meru south district Kenya.
2. Investigate the hindrances to effective teaching of mathematics in meru south district Kenya.
3. Determine gender differences that exist in the performance of mathematics in meru south district Kenya.

1.4 Research questions

1. What are the various types of teaching methods and how to they affect performance of learners in mathematics in meru north district Kenya?
2. What are the hindrances to effective teaching of mathematics in meru south district Kenya?
3. What gender differences exist in the performance of mathematics in meru south district Kenya?

1.5. Significance of the Study

The study will benefit the following disciplines:

This study will emphasize the need for teachers to plan their materials well and also use effective teaching methods while teaching mathematics and therefore enable teachers to teach effectively for the subject content to be understood properly by the mildly learners thus high performance.

Mathematics teacher performance will be reviewed, priority areas for improvement will be identified and improvement plan containing may be developed for each priority area.

Provide information that can be used by the Ministry of Education Policy Makers to identify attitudes that can be associated more with high performance of girls in mathematics among students.

The study will call upon the government to equip teachers with the necessary materials to enable them to effectively teach mathematics.

1.6 Scope of the Study

The study was carried out in Meru South District Kenya. The study investigated the impact of teaching methods on performance of learners in mathematics and specifically looked at the factors affecting the effective teaching of mathematics and the reasons for gender disparities in mathematics performance.

The study was taken between April 2009 and September 2009. The researcher chose this time frame because schools were opening for a new term and therefore was able to get the respondents.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter discusses the literature by accredited researchers related to cultural norms and academic performance.

2.2. Types of teaching methods

2.2.1 A Problem-Oriented Curriculum

The National Council of Teachers of mathematics (2000) Problem Solving Standard states that high school math teaching should be able to “build new mathematical knowledge through problem solving; solve problems that arise in mathematics and elsewhere; apply and adapt a variety of appropriate strategies to solve problems; monitor and reflect on the process of mathematical problem solving” (NCTM, Problem Solving 2000).

It is true that memorizing a procedure or formula can enable a student to easily solve a certain type of problem given by the teacher — but this method breaks down when the problems grow more complex and unfamiliar. Since much of real life deals with complex and unfamiliar problems for which there is no solution manual, the NCTM says that “a major goal of high school mathematics is to equip teaching with knowledge and tools that enable them to formulate, approach, and solve problems beyond those which they have studied” (NCTM, Problem Solving,2000). This means that teaching needs opportunities to develop their problem-solving skills in authentic situations — they need to “investigate questions, tasks, and situations and create and apply strategies to work on and solve problems” that are suggested by the teacher or the class. These problems should relate to the teaching

personal experiences or to the real world, because such problems motivate teaching.

For example, because “the need to make decisions based on numerical data permeates society,” teachers easily see the power of probability and statistics when it is applied in a real-world situation (Zemelman et al., 1998).

In order to effectively teach with a problem-solving focus, a teacher needs to carefully plan problems that will give teaching the maximum opportunity to hone their skills. This means the problems need to be complex enough to let teachers approach them from different angles, explore different strategies, reflect on their progress, and revise their methods. It also means the problems must be within the grasp of the students, because if they are too hard and the teachers are repeatedly unsuccessful, they will lose confidence in their problem solving abilities and their willingness to work on problems will not develop, or could even be destroyed. (Zemelman et al., 1998).

2.2.2 Focusing on Ideas, Not Skills

Stein (2001) notes that in past decades, math teachers were “more concerned with teaching rote, use of procedures rather than with their understanding of concepts and development of higher-order thinking skills”. This focus on skills has contributed to generations of Americans feeling that math is boring, static, and repetitive. It squelches teaching natural imaginative thinking and discourages them from developing and using new problem-solving techniques. Zemelman et al. (1998) write that while knowing facts or procedures “without true understanding of the underlying concepts guarantees serious problems with learning other concepts,” focusing on understanding mathematical ideas makes

teaching “far more likely to study mathematics voluntarily and acquire further skills as they are needed”. Focusing on the ideas gives teaching a strong foundation for learning new, related ideas. It also helps them to know when to apply particular skills or procedures, because they see the underlying reasons that these methods work.

Battista (2000) writes that “how teaching constructs new ideas is heavily dependent on the cognitive structures teaching have previously developed”. Therefore, effective mathematics teachers are aware of their teaching’ mathematical thinking, and structure their teaching of new ideas to work with or correct those ways of thinking. Additionally, part of focusing on ideas is teaching met cognitive strategies— “classroom discussions should deal with what it means to make sense of a mathematical idea, how to make sense of ideas, and how to know when you have made sense of an idea”

2.2.3. Cooperative Group Work

Cooperative learning groups are effective in math, just as they are in other disciplines, but they must be implemented with care. Reynolds and Muijs (1999) write that some research shows whole-class instruction and teacher-led discussions to be the most effective mathematics instruction method for teaching basic skills. However, they note the effectiveness of group work for teaching higher-level thinking. Cooperative group work helps students to reflect on and talk about their own ideas and thinking, and it forces them to consider other students’ ideas, which may be very different from their own. It can even reduce math anxiety and help them to “overcome their insecurity about problem- solving because they can see more able peers struggling over difficult problems”

Effective group work requires a lot of preparation — “it is insufficient to put students in groups and let them get on with it” (Reynolds & Muijs, 1999). Battista (2001) notes that all students in a group must be “fully engaged as partners” for group work to be most effective. To avoid having a few students do the work while others sit passively, teachers should give clear instructions, and make sure all students are aware of the group’s goals and how they will individually be held accountable. It is also important that the task is appropriate for group work, that it is centered on an important idea or concept, and that the students are interested by it (Grouws & Cebulla, 2000,).

The level of the task should be challenging, but not beyond the students’ ability or they will give up quickly. Group work is often more effective for introducing a new concept than for reviewing old material (Reynolds & Muijs, 1999,). Closure is essential to group work — if the students do not arrive at the key conclusions or procedures, the teacher should bring it up. A whole class discussion following the group work is an effective way to provide closure (Grouws & Cebulla, 2000, Groups should be used in conjunction with sessions of direct teaching and individual work time. Grouws and Cebulla (2000) note that it may be useful to have students work in collaborative groups after they have worked on the task individually, and Reynolds and Muijs (1999) assert that a mixture of whole-class and collaborative group teaching is the most effective.

2.3. Teacher quality and academic performance of learners in mathematics.

Methods employed by teachers to teach Mathematics and Science subjects in primary and secondary schools are to a very large extent influenced by the kind of resources and facilities available in the school. The teaching methods, in turn, influence the level and quality of

participation and performance in mathematics by students, particularly girls. In general, where resources and facilities - teachers, textbooks, laboratories, chemicals, tools and equipment, teaching aids, stores, offices etc. - are inadequate, the teaching approach tends to be teacher-centered MOEST (2003).

This type of approach is heavily dominated by the teacher as he or she lectures on the subject, gives notes and demonstrates the practical aspects of the lesson. The students remain passive participants expected to listen and observe only. The teacher, therefore, is the sole source of knowledge for the pupils this can be risky in the event that the teacher is inadequately informed on the subject or is not adequately trained in the art of communication. A teaching approach that centers on the teacher is bad for science teaching and learning and soon kills the interest of students in the subject. UNESCO (2000).

But where facilities and resources are available, a qualified and motivated science teacher will deploy methods that center on the learner. Such an approach emphasizes practical activities and has the pupils experimenting, solving problems, discussing with each other and involved in practical hands-on-activities. This approach stimulates curiosity, imagination and critical thinking. It keeps the lessons exciting and captivating to the young people, particularly girls.

The quality of the learning environment at school depends to a large extent on the quality of the human resource capacity available. Teachers are the most important human resource and remain the backbone of any educational system UNESCO (2000). One of the key factors in determining examination results is the availability and quality of teachers. Trained teachers represent a significant social investment and their levels of motivation and career commitment is of concern to policy

makers UNESCO (2000).

UNESCO (2000) notes that the availability of a range of teaching and related equipment, supplies furniture and various forms of printed media for teachers and learners is critical in facilitating the process of teaching and learning world wide. The report goes on to note that access to a range of resources and services enables teachers to enrich the teaching environment Neuman (1980) quoted by Wamai (1991) states that textbooks and allied materials are the most important consistent factor upgrading academic achievement especially in schools with less qualified teachers. This view is supported by MOEST (2003) which points out that textbooks, whether designed for use in activities led by the teachers or independently by pupils, offer the most explicit instructed design formats.

2.4. Gender disparities in mathematics.

For over twenty years there has been concern about the lack of women in higher level mathematics and in careers for which mathematics was a prerequisite. Fennema and Sherman (1977) claimed that a lack of mathematical background knowledge prevented women from entering a variety of occupations. In Australia too, mathematics results are used as a critical filter for higher education and future careers (Willis, 1995) and sex differences in participation remain a concern (Cuttance, 1995; Barnes & Home, 1996). Over the last two decades in Australia there have been a number of government policy initiatives concerning the education of girls (Australian Education Council, 1993). There has also been renewed interest in the potential of single-sex environments to cater more effectively for the needs of girls (Milligan & Thomson, 1992).

According to McLeod (1992) Attitudes toward mathematics, including perceptions of how appropriate mathematics is for females, play a prominent role in females' lower performance and participation in mathematics in relation to males. Based on their analysis of NAEP data trends, Bae, Choy, Geddes, Sable, and Snyder (2000) contend, "Achievement gaps appear more closely related to attitudes than to course taking". The data show that females are less likely than males to like or to think they were good at mathematics. Females also experience mathematics anxiety to a greater degree than males (Levine, 1995).

Females' dispositions toward—and hence achievement and participation in— mathematics are believed to be socialized, inculcated by a society that tends to view mathematics as a male domain and which perpetuates the idea that males are naturally more mathematically inclined (Hanson, 1997). This is true because girls who do well in math are referred to as boys.

Griffiths (1992), indicates that research carried out on 750 students at Edinburgh University between 1987 and 1991 showed that female students rated their own IQs lower than those of their fathers and, in three of the five years, higher than those of their mothers. (Arnot, M. 1983),

Conversely, male students rated themselves superior to their mothers and, in three of five years, to their fathers too. This suggests a widely accepted belief that men are more intelligent than women. The issue is made worse by the fact that the women being tested, presumably the intellectual elite, should be more aware of gender issues and research, or at the very best, should be more confident of their own ability (Arnot, M. 1983).

CHAPTER THREE;

3.0 METHODOLOGY

3.1 Introduction

This chapter details the methods the researcher used to collect data.

3.2 Research Design

The research was presented in both qualitative and quantitative design. Qualitative design helped the researcher get a deeper meaning of the study while quantitative helped in analyzing the numbers that were involved in the study. A descriptive survey design was used and this helped the researcher get a sample of variables than the whole population.

3.3 Area of study

The research was carried in Meru South District Kenya. The case study was selected because that is where the researcher lives and therefore it was made easy to get information from the respondents. The costs of research were also being reduced that is the researcher needed to take few trips.

3.4 Respondents and sample selection

The study included the teachers and pupils. The teachers were selected using purposive sampling and the pupils were selected using random sampling. A total of 50 pupils and 20 teachers were expected to participate in the study.

3.5 Instruments of Data Collection

The instruments of the study included; interviews with the teachers questionnaires to pupils of which the teachers helped the pupils in filling them.

3.6. Reliability of the instruments

Questionnaires helped to collect a lot of information from the pupils in a short time while interviews helped the researcher get explanations from the teachers on certain issues like the methods they use for teaching mathematics. Interviews also helped the researcher rephrase questions that the respondents did not understand.

3.6 Data Collection Procedures

A letter of introduction was picked from the University and this helped in a way that the interviewees were given the researcher information. The letter was introduced to the headmaster before questionnaires were distributed to the pupils and interviews held with the teachers.

3.7. Statistical Treatments of Data

The frequency and percentage were used to determine the number of sample respondents that participated in the study and the number that participated positively in the research.

Formula;

Percentage (%) x 100

Total number of respondents

Where F = number of respondents observed

Qualitative analysis; Data from semi-structural, observation, and in-depth interviews was standardized hence requiring categorization. Such data was presented in a descriptive form above which was used to discuss the results of quantitative data.

CHAPTER FOUR

4.0 DATA PRESENTATION ANALYSIS AND INTERPRETATION.

4.1 Introduction

This chapter is a presentation, interpretation and discussion of the field results. The results are presented in tables and in form of frequency counts and percentages. The results and discussions are centered on the set objectives of the study. It focuses on the impact of teaching methods on pupil's performance in mathematics in meru south district Kenya.

4.2 Profile of the respondents

Table 4:1: profile of the respondents

Respondents	Frequency	Percentage (%)
Sex		
Male	30	60
Female	20	40
Total	50	100
Age		
13 yrs and below	8	16
14-16 yrs	22	44
17 and above	10	20
Total	55	100
Academic level		
Standard six	15	30
Standard seven	25	50
Standard eight	10	20
Total	50	100

Fifty (50) questionnaires were distributed to the pupils and all were filled and returned this therefore represents 100% of the total number of questionnaires that were distributed.

The study covered 50 randomly selected pupils of whom 30(60%) were male and 20(40%) were female

The age category of the respondents were divided into three groups that are 13 yrs and below were 8 (16%), 15-16 yrs were 22 (44%) and 17yrs and above were 10 representing (20%) of the total number of the respondents.

The academic level of the respondents was divided into three categories that are standard six, standard seven and standard eight level. 15 (30%) of the respondents were in standard six, 25 [50%] were in standard seven and 10 (20%) of the respondents were in standard eight.

Interviews were used to extract data from the teachers and 20 teachers were selected and 8 of the members were female and 12 were male.

The respondents were asked the level of performance in mathematics in their schools and his was their response.

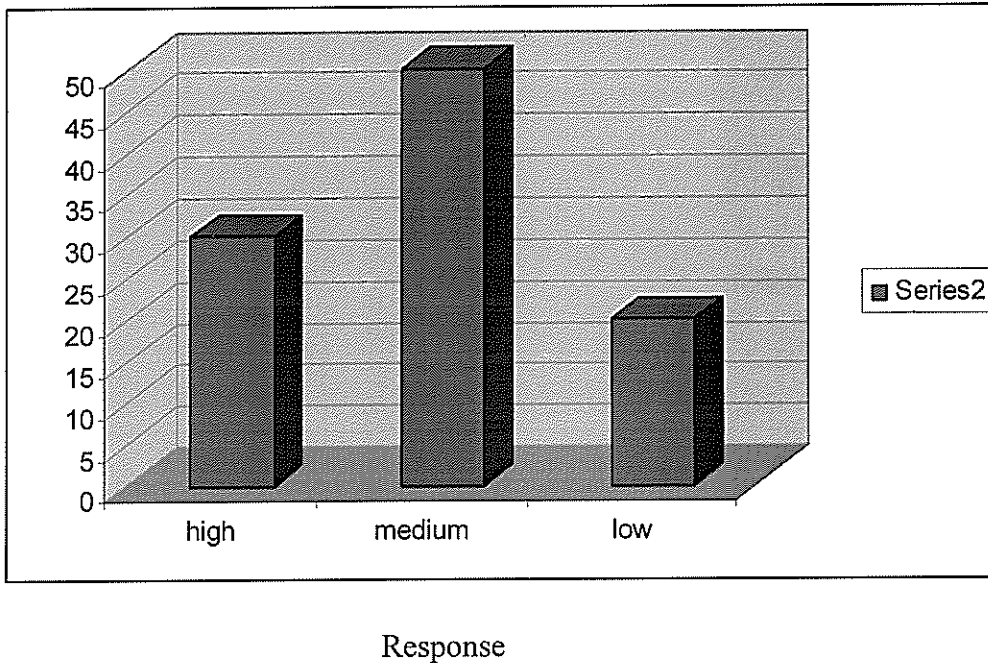
4.2: Response on the level of mathematics in the schools

Response	Frequency	Percentage (%)
High	15	30
Medium	25	50
Low	10	20
Total	50	100

Source: filed data 2009

Figure 4.2: Response on the level of mathematics in the schools

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According to table and figure 4.2, 25(50%) of the respondents revealed that their level of performance in mathematics was moderate, 15(30%) said that it is high while 10(20%) of the respondents revealed that their level of performance in mathematics was low. This means that in most schools the level of performance in mathematics is moderate.

In the interviews held with the teachers they revealed that the performance level in mathematics. In most schools in moderate this is because most pupils especially the girls have a bad attitude towards the subject and their fore do not concentrate and are always reluctant and not attentive hence with this pupils are not in position to score high in the subject.

The respondents were asked whether their teachers use effective methods while teaching mathematics and below was their response.

Table 4.3: Response on whether teachers use effective methods in teaching

Response	Frequency	Percentage (%)
Yes	27	54
No	16	32
No response	7	14
Total	50	100

Source: field data 2009

The table above shows that 27(54%) of the respondents agreed that teachers use effective methods in teaching mathematics while 16(32%) disagreed and 7(14%) of the respondents did not give any response others their responses were not clearly indicated.

The teachers revealed that despite the fact that pupils are not getting high grades, the teaching methods used in most schools are effective especially if qualified teachers are employed. In this case teachers introduce new methods in solving mathematical problems. However, there are some teachers (those who are not qualified) do not apply effective methods and this affects the performance of pupils.

According to the National Council of Teachers of mathematics (2000) Problem Solving Standard states that high school math teaching should be able to “build new mathematical knowledge through problem solving; solve problems that arise in mathematics and elsewhere; apply and adapt a variety of appropriate strategies to solve problems; monitor and reflect on the process of mathematical problem solving” (NCTM, Problem Solving(2000)).

The respondents were asked whether effective teaching methods helps learner perform well in mathematics and this was their response

Table 4.4: Response on whether effective teaching methods helps learner perform well in mathematics

Response	Frequency	Percentage (%)
High	35	70
Medium	10	20
Low	5	10
Total	50	100

Source: field data 2009

Table 4.4 indicates that 35(70%) of the agreed that effective teaching methods helps learner perform well in mathematics while 10(20%) disagreed and 5(10%) of the respondents were not sure whether effective teaching methods helps learner perform well in mathematics.

It was also revealed from the interviews that if effective methods are applied, pupils are more likely to perform well. For example if methods of solving mathematical problems are effectively taught and understood by the pupils, they can easily solve mathematical problems hence resulting to better performance.

The respondents were asked whether teaching methods change the negative attitudes learners have towards mathematics and this was their response

Table 4.5: Response on whether effective teaching methods can change the negative attitudes learners have towards mathematics

Response	Frequency	Percentage (%)
Agree	30	60
Disagree	16	32
Not sure	4	8
Total	50	100

Source: field data 2009

Figure 4.5: Response on whether effective teaching methods can change the negative attitudes learners have towards mathematics

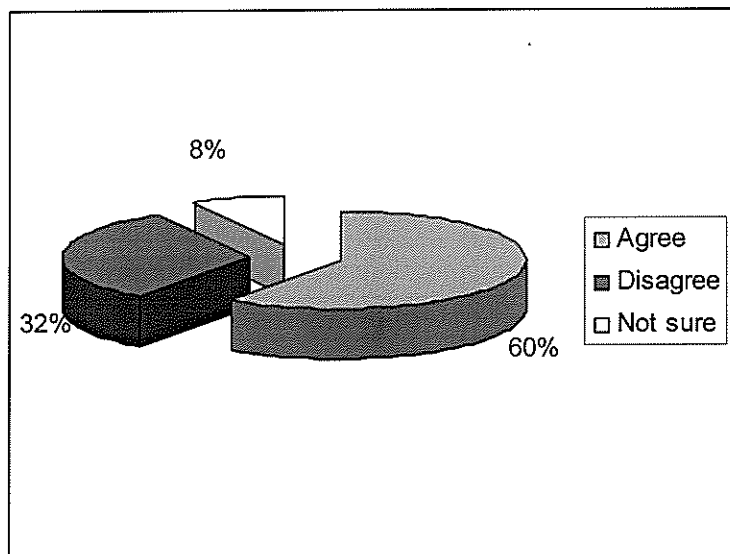


Table and figure 4.5 indicates that 30(60%) of the respondents agreed that effective teaching methods change the negative attitudes learners have towards mathematics while 16(32%) of the respondents disagreed and 4(8%) of the respondents were not sure whether effective teaching methods change the negative attitudes learners have towards mathematics. This implies that if teachers use effective methods in teaching, pupils can change the bad attitudes they have towards the subject and perform better and hence score high grades.

The teachers revealed that if pupils can -be taught and understand the problem, they can adapt new concepts of solving problems in their own way.

According to Stein (2001) notes that in past decades, the past mathematics teachers were “more concerned with teaching’ note use of procedures rather than with their understanding of concepts and development of higher-order thinking skills”. This focus on skills has

contributed to generations of Americans feeling that math is boring, static, and repetitive. It squelches teaching natural imaginative thinking and discourages them from developing and using new problem-solving techniques.

4.3 Types of teaching methods

The teachers revealed that the types of teaching methods do their teachers use while teaching mathematics were;

Problem-Oriented Curriculum this is a teaching method that build new mathematical knowledge through problem solving; solve problems that arise in mathematics and elsewhere; apply and adapt a variety of appropriate strategies to solve problems; monitor and reflect on the process of mathematical problem solving. With this method pupils can memorize procedures or formulas that can enable them to easily solve a certain type of problem given by the teacher — but this method breaks down when the problems grow more complex and unfamiliar this is supported by National Council of Teachers of mathematics (2000)

Cooperative Group Work Students' working in groups is another way teachers teach mathematics. Collaborating allows students to talk among each other and listen to all view points of discussion or assignment. It helps pupils think in an unbiased way. When this lesson plan is carried out, the teacher may be trying to assess the lesson of working as a team, leadership skills, or presenting with roles.

Discussion away to create an exchange of ideas is to provide two way communications through discussion. The educator speaks directly to a learner, asks questions or makes comments, then waits for a response. This helps auditory learners retain the material.

Demonstration in this case teachers may wish to both tell and show what steps to take in an educational process. This allows another element to assist in gathering knowledge. By seeing a task performed, learners are more aware of what materials are needed, remember steps in the process, and observe the final outcome of the task.

Questioning this is a teaching method that includes questioning and is similar to testing. A teacher may ask a series of questions to collect information of what students have learned and what needs to be taught. Testing is another method of questioning. A teacher tests the student on what was previously taught in order to identify if a student has learned the material.

4.4 Teacher quality and academic performance of learners in mathematics

The respondents were asked whether the quality of teachers contributes to performance in mathematics and below were their response.

Table 4.6: Response on whether quality of teachers contributes to performance in mathematics

Response	Frequency	Percentage (%)
Agree	45	90
Disagree	5	10
Not sure	-	-
Total	50	100

Source: field data 2009

According to table 4.6, most of the respondents that is 45(90%) agreed that quality of teachers contributes to performance in mathematics while 5(10%) of the respondents disagreed. This means that for students to

perform well in mathematics, teachers should be well qualified in teaching mathematics.

In the interviews held with the teachers they revealed that it is true the quality of teachers contribute to pupil's performance. Qualified teachers are in position to teach pupils and perform well as they use effective methods to teach, they motivate pupils and they know how to handle pupils and as a result they perform better.

According to UNESCO (2000), Teachers are the most important human resource and remain the backbone of any educational system one of the key factors in determining examination results is the availability and quality of teachers. Trained teachers represent a significant social investment and their levels of motivation and career commitment is of concern to policy makers UNESCO (2000).

The respondents were asked whether teachers who know how to use effective teaching methods lead to good performance in mathematics and below were their response

Table 4.7: Response on whether teachers who know how to use effective teaching methods lead to good performance.

Response	Frequency	Percentage (%)
Agree	25	50
Disagree	19	38
Not sure	6	12
Total	50	100

Source: field data 2009

The table above indicates that 25(50%) of the respondents agreed that teachers who know how to use effective teaching methods lead to good

performance while 19(38%) of the respondents disagreed and 6(12%) of the respondents were not sure. This means that teachers who use effective teaching methods contribute to pupil's better performance. The teachers established in the interviews that teachers who use effective methods contribute to pupils better performance in mathematics but they added that if effective methods are to be applied there should be resources and facilities. These may include mathematics text books; pupils should have mathematics equipments like sets among others.

According to MOEST (2003), Methods employed by teachers to teach Mathematics and Science subjects in primary and secondary schools are to a very large extent influenced by the kind of resources and facilities available in the school. The teaching methods, in turn, influence the level and quality of participation and performance in mathematics by students, particularly girls. In general, where resources and facilities - teachers, textbooks, laboratories, chemicals, tools and equipment, teaching aids, stores, offices etc.

- Are inadequate, the teaching approach tends to be teacher-centered

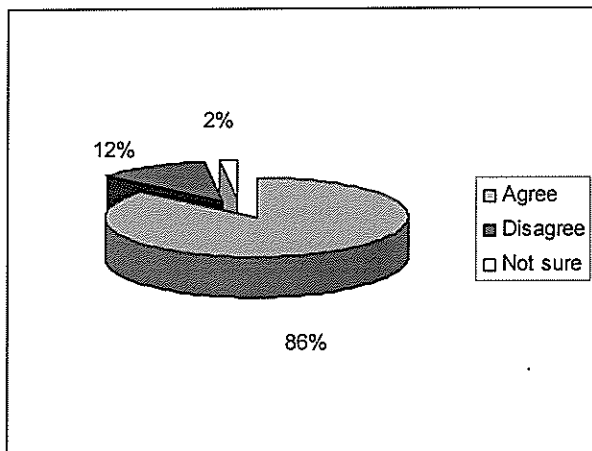
The respondents were asked whether teachers attitudes towards learners discourages them and this was their response.

Table 4.8: Response on whether teachers attitudes towards learners discourages them.

Response	Frequency	Percentage (%)
Agree	43	86
Disagree	6	12
Not sure	1	2
Total	50	100

Source: field data 2009

Figure 4.8: Response on whether teachers attitudes towards learners discourages them.



The figure and table above shows that 43(86%) of the respondents agreed that teachers attitudes towards learners discourages them, 6(12%) disagreed and 1(2%) of the respondents were not sure whether teachers attitudes towards learners discourages them. This implies that teachers contribute to pupil's performance either negatively or positively.

The teachers revealed that the personality of the teachers teaching mathematics is worrying. Their own attitudes to mathematics may contribute to their inability to motivate the pupils to learn mathematics. The teaching methods that are used remain predominantly the traditional 'talk and chalk' mode of delivery. The teachers are under pressure to enable their pupils pass examinations and are therefore forced to water down the implemented curriculum. Teachers sometimes contribute to girls' poor self-concept in mathematics. They may imply, for example, that girls do not need mathematics or they may react more negatively when girls ask questions of clarification than when boys.

The respondents were asked whether lack of learning resources hinders the effective teaching of mathematics and this was their response

Table 4.9: Response on whether lack of learning resources hinders the effective teaching of mathematics

Response	Frequency	Percentage (%)
Agree	48	96
Disagree	2	4
Not sure	-	-
Total	50	100

Source: field data 2009

According to table 4.9, 48(96%) of the respondents agreed that lack of learning resources hinders the effective teaching of mathematics while 2(4%) of the respondents disagreed. The pupils emphasized that for the teachers to apply effective methods and for the pupils to pay mathematics, there should be learning resources.

The teachers revealed that effective methods are applied where there are learning resources. If there are learning resources, pupils can easily understand what they are taught and perform better. Such learning resources include mathematics text books and instruments among others.

According to MOEST (2003), Methods employed by teachers to teach Mathematics and Science subjects in primary and secondary schools are to a very large extent influenced by the kind of resources and facilities available in the school. The teaching methods, in turn, influence the level and quality of participation and performance in mathematics by students, particularly girls. In general, where resources and facilities - teachers, textbooks, laboratories, chemicals, tools and equipment, teaching aids, stores, offices etc.

- Are inadequate, the teaching approach tends to be teacher-centere

4.5 Gender disparities in mathematics

The respondents were asked whether girls perform poorly in mathematics and this was their response

Table 4.10: Response on whether girls perform poorly in mathematics

Response	Frequency	Percentage (%)
Agree	32	64
Disagree	14	28
Not sure	4	8
Total	50	100

Source: field data 2009

Table 4.10 indicates that 32(64%) of the respondents agreed that girls perform poorly in mathematics, 14(28%) disagreed and 4(8%) of the respondents were not sure. This means that in many schools, girls do perform poorly in mathematics.

The teachers also revealed that girls perform poorly in mathematics. This is attributed to the fact that they naturally hate the subject and also have a feeling or thinking that mathematics is meant for boys. Therefore they tend to ignore the subject thus performing poorly in it.

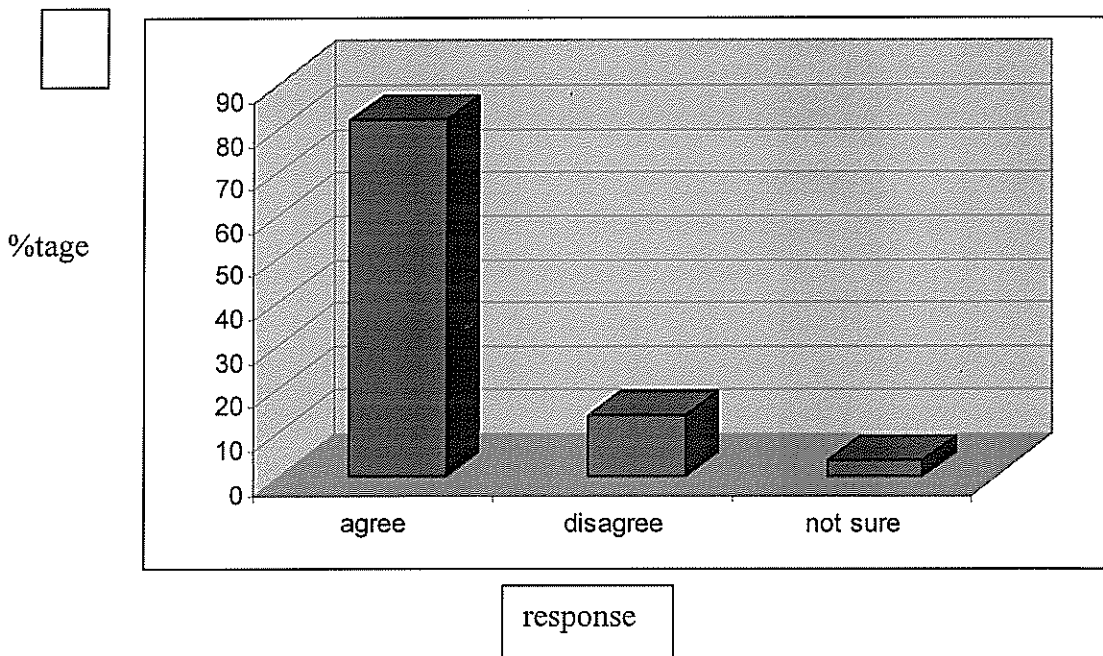
The respondents were asked whether girls' attitudes towards mathematics lead to poor performance and this was their response

Table 4.11: Response on whether girl's attitudes towards mathematics lead to poor performance.

Response	Frequency	Percentage (%)
Agree	41	82
Disagree	7	14
Not sure	2	4
Total	50	100

Source: field data 2009

Table 4.11: Response on whether girl's attitudes towards mathematics lead to poor performance.



The table and chart above shows that 41(82%) of the respondents agreed that girls attitudes towards mathematics lead to poor performance, 7(14%) of the respondents disagreed and 2(4%) were not sure. This means that most girls perform poorly in mathematics because of the bad attitudes they have towards that subject.

The teachers established that in many schools, girls fail mathematics because of the bad attitude they have towards that subject. Girls think

that mathematics is very difficult subjects and they take their IQs to be low. There fore they have an attitude that mathematics is for boys with higher IQs.

According to McLeod (1992) Attitudes toward mathematics, including perceptions of how appropriate mathematics is for females, play a prominent role in females’ lower performance and participation in mathematics in relation to males. Based on their analysis of NAEP data trends, Bae, Choy, Geddes, Sable, and Snyder (2000) contend, “Achievement gaps appear more closely related to attitudes than to course taking”. The data show that females are less likely than males to like or to think they were good at mathematics. Females also experience mathematics anxiety to a greater degree than males (Levine, 1995).

The respondents were asked whether the Society’s attitude towards girls leads to poor performance in mathematics and this was their response

Table 4.12 shows that 30(60%) of the respondents agreed that Society’s attitude towards girls leads to poor performance in mathematics,

Response	Frequency	Percentage (%)
Agree	30	60
Disagree	13	26
Not sure	7	14
Total	50	100

Source: field data 2009

Table 4.12 shows 30(60%) of the respondents agreed that society's attitude towards girls leads to poor performance in mathematics,

13(26%) disagreed and 7(14%) were not sure. This implies that girls fail mathematics because of the society also see mathematics as a subject for boys.

The study revealed that the society know it that mathematics is meant for boys there fore even if girls perform poorly in the subject they are not blamed or encouraged at all.

This is supported by (Hanson, 1997), Females' dispositions toward—and hence achievement and participation in—mathematics are believed to be socialized, inculcated by a society that tends to view mathematics as a male domain and which perpetuates the idea that males are naturally more mathematically inclined. This is true because girls who do well in referred to as boys.

CHAPTER FIVE

5.0 SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives the summary of the findings, conclusions and recommendations of the study. It focuses on the impact of teaching methods on pupil's performance in mathematics in meru south district Kenya. The specific objectives of the study were; to determine the various types of teaching methods and their effect on performance of learners in mathematics, to investigate the hindrances to effective teaching of mathematics and to determine gender differences that exist in the performance of mathematics in meru south district Kenya.

5.2 Summary

The first objective of the study was to determine the various types of teaching methods and their effect on performance of learners in mathematics. The study revealed that Problem-Oriented Curriculum, corporative group work or collaboration, demonstration, discussion and questioning were some of the teaching methods used by teachers in teaching mathematics.

Effective group work requires a lot of preparation — “it is insufficient to put students in groups and let them get on with it” (Reynolds & Muijs, 1999). Battista (2001) notes that all students in a group must be “fully engaged as partners” for group work to be most effective. To avoid having a few students do the work while others sit passively, teachers should give clear instructions, and make sure all students are aware of the group's goals and how they will individually be held accountable. It is also important that the task is appropriate for group work, that it is

centered on an important idea or concept, and that the students are interested by it (Grouws & Cebulla, 2000,).

The second objective was to investigate the hindrances to effective teaching of mathematics. The study revealed that the hindrances to effective teaching of mathematics Were use of unqualified and un trained teachers, use of poor teaching methods, lack of learning resources among others.

This is supported by UNESCO (2000), Teachers are the most important human resource and remain the backbone of any educational system one of the key factors in determining examination results is the availability and quality of teachers. Trained teachers represent a significant social investment and their levels of motivation and career commitment is of concern to policy makers UNESCO (2000).

According to. MOEST (2003), Methods employed by teachers to teach Mathematics and Science subjects in primary and secondary schools are to a very large extent influenced by the kind of resources and facilities available in the school. The teaching methods, in turn, influence the level and quality of participation and performance in mathematics by students, particularly girls. In general, where resources and facilities - teachers, textbooks, laboratories, chemicals, tools and equipment, teaching aids, stores, offices etc.

- are inadequate, the teaching approach tends to be teacher-centered

The third objective was to determine gender differences that exist in the performance of mathematics in meru south district Kenya. The study revealed that that gender differences in mathematics are caused by girl's bad attitudes towards the subject, society's attitudes towards girls and mathematics all these contribute to differences in performance between girls and boys.

According to McLeod (1992) Attitudes toward mathematics, including perceptions of how appropriate mathematics is for females, play a prominent role in females' lower performance and participation in mathematics in relation to males. Based on their analysis of NAEP data trends, Bae, Choy, Geddes, Sable, and Snyder (2000) contend, "Achievement gaps appear more closely related to attitudes than to course taking". The data show that females are less likely than males to like or to think they were good at mathematics. Females also experience mathematics anxiety to a greater degree than males (Levine, 1995).

5.3. Conclusion.

The purpose of the study was to investigate the impact of teaching methods on pupil's performance in mathematics in meru south district Kenya.

The study revealed that Problem-Oriented Curriculum, corporative group work or collaboration, demonstration, discussion and questioning were some of the teaching methods used by teachers in teaching mathematics.

The study revealed that the hindrances to effective teaching of mathematics were use of unqualified and un trained teachers, use of poor teaching methods, and lack of learning resources among others.

The study revealed that that gender differences in mathematics are caused by girl's bad attitudes towards the subject, society's attitudes towards girls and mathematics all these contribute to differences in performance between girls and boys.

5.4. Recommendations

The government should construct facilities at school for mathematics teachers to teach in a conducive environment in order to aid the better performance of mathematics pupils in their schools.

The government should have a policy in place that encourages the taking up of mathematics subject especially to the female students who at times think they are not good enough for the subject

The girl child should be encouraged to relate equally with boy in all subjects regardless of whether it is mathematics or not.

The community should be sensitized to encourage girls to perform well in the subject other than telling them that mathematics is for boys.

Teachers should use effective methods in teaching the subject and only qualified teachers should be used or employed to get better grades.

Suggestion for further research

More research should be done on the area of impact of teaching methods on pupil's performance in mathematics. Few researches have been done on this topic.

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APPENDIX B: QUESTIONNAIRE FOR PUPILS

Dear respondent,

I am a student of Kampala International University carrying out an academic research on.

The topic “impact of teaching methods on pupil’s performance in mathematics in Meru south district Kenya. You have been randomly selected to participate in the study and are therefore kindly requested to provide an appropriate answer by either ticking the best option or give explanation where applicable. The answers provided will only be used for academic purposes and will be treated with utmost confidentiality.

NB: Do not write your name anywhere on this paper.

A) Personal Information

1. GENDER

Male []

Female []

2: AGE

L3 and below []

14-17 []

L7and above []

2. Class

b) Standard six []

c) Standard seven []

d) Standard eight []

1. What is the level; of performance in mathematics in your school

High [] medium [] low []

2. Do your teachers use effective methods while teaching mathematics?

Yes []

No []

3. Teaching methods helps learner perform well in mathematics

-Agree disagree not sure

4. Teaching methods change the negative attitudes learners have towards mathematics

Agree disagree not Sure

5. What types of teaching methods do your teachers use while teaching mathematics?

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

Teacher quality and academic performance of learners in mathematics

6. The quality of teachers contributes to performance in mathematics

Agree disagree not sure

7. Teachers who know how to use effective teaching methods lead to good performance in mathematics

Agree disagree not sure

8. Teachers attitudes towards learners discourages them

Agree. disagree not sure

9.Lack of learning resources hinders that effective teaching of mathematics Agree disagree not sure

Gender disparities in mathematics

10. Girls perform poorly in mathematics.

Agree disagree not sure

11. Girls attitudes towards mathematics lead to poor performance

Agree disagree not sure

12. Society's attitude towards girls leads to poor performance in mathematics.

Agree disagree not sure

PART ONE; TEACHERS QUESTIONNAIRE.

You are kindly requested to tick or fill as possible.

The information will only be used for academic purposes and will only be kept confidentially by the researcher. No name or any personal particulars are required.

1. What is your mathematics teaching experience?

1year or less	
2 years	
3 years	
4yearsor more	

2. What often do you assess your pupils?

Weekly	
Monthly	
After every topic	
Termly	

3. Do your students often comes for your assistance?

1.Rarely	
2.Always	
3. Often	
4.Not at all	

4. How would you rate the conditions of each of the following facilities in your school and /or in your class?

FACILITY	NOT available	Inadequate	Adequate Under utilized	Available
Math's course Books				
Math's				

Supplementary Books					
Geometrical Sets					
Classrooms					
Desks					

5) Is mathematics teaching interesting at your school? If yes give reasons.

.....

6) do you believe that the mode of teaching mathematics affects performance at your school?

.....

7) Which mathematics teaching methods do you employ at your school?

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

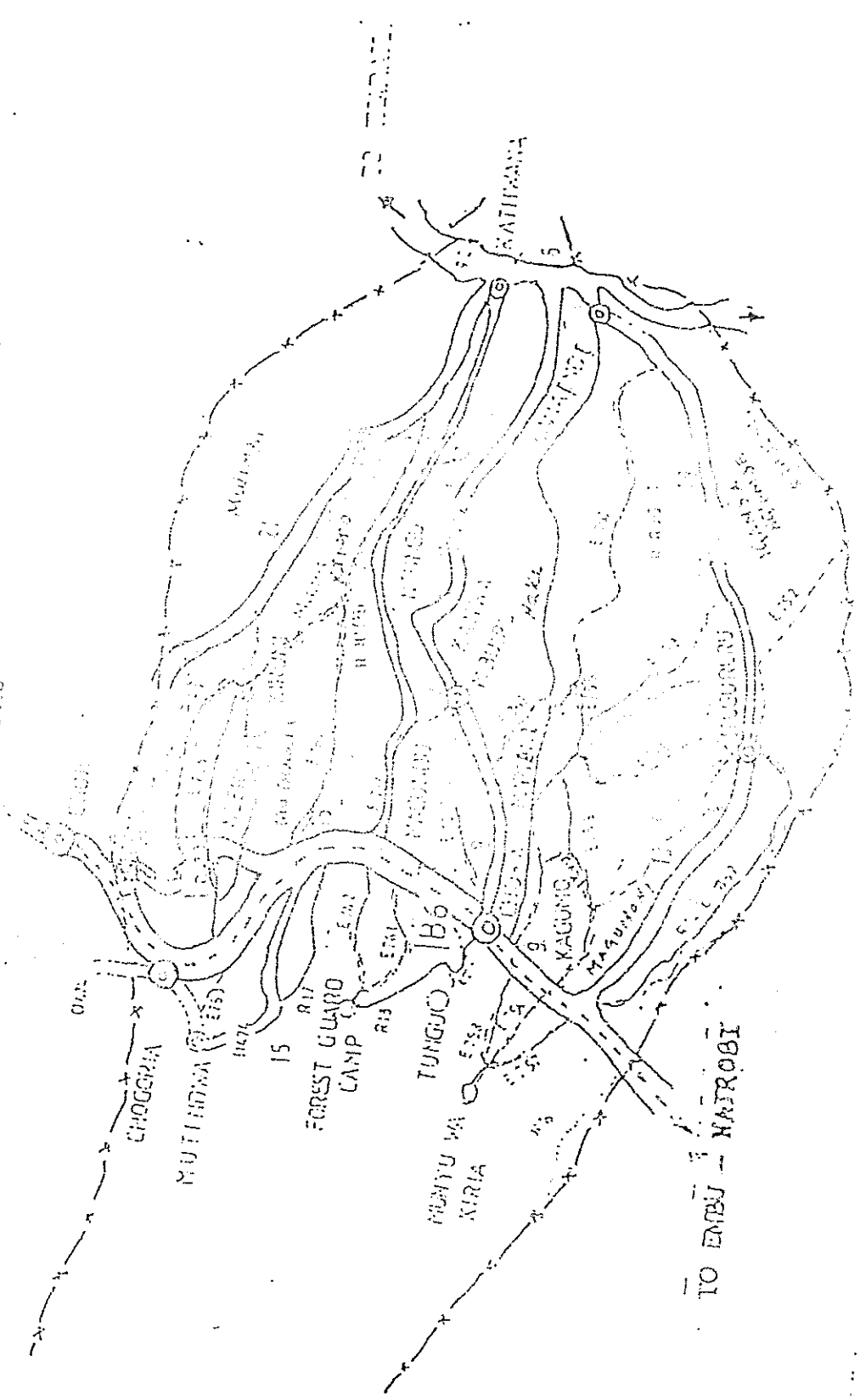
8) What problems do learners of mathematics encounter from there as above mentioned methods?

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

9) what in your opinion is the impact of teaching methods on pupils learning of mathematics?

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

APPENDIX 1: MAP OF RESEARCH ENVIRONMENT



A MAP OF
MERU SOUTH DISTRICT

SCALE 1:250,000