STUDENTS AND TEACHERS ATTITUDE FACTORS CONTRIBUTING TO POOR PERFORMANCE IN MATHEMATICS IN K.C.S.E IN SELECTED PUBLIC SECONDARY SCHOOLS IN KIAMBAA DIVISION OF CENTRAL PROVINCE,KENYA

MARTHA WAMBUI KARIGI, DR. SAMMY TUMUTI, PHD

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[1]Martha Wambui Karigi, [2]Dr. Sammy Tumuti, Phd

[1]Student, Kenyatta University (KU), Kenya

[2]Senior Lecturer, Department of Educational Psychology, Kenyatta University (KU), Kenya

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ABSTRACT

Students' poor performance in national examination remains a major concern worldwide and Kenya in particular. Teachers, students, parents, curriculum developers and the public have tended to blame one another for the poor performance in Mathematics at secondary school level. In an attempt to respond to this problem, the Kenyan Mathematics scholars have carried out many studies in Mathematics education.

Despite these studies, students' performance remained poor. This means that the main reason for this poor performance had not been established. This study aimed at determining the students and teacher's attitude as factors contributing to the poor performance in Mathematics by students in secondary schools in Kiambaa Division.

The study employed a descriptive survey and focused on Form 3 students and their Mathematics teachers. Random stratified technique was used to select 6 public secondary schools from 40 public schools in Kiambaa Division. Form 3 students were selected randomly. Simple random sampling was used to select 20 students and 4 teachers from each school sampled. Data was collected with two instruments, Mathematics Teacher Questionnaire (MTQ) and Mathematics Student's Questionnaire (MSQ). A total of 16 teachers and 80 students filled the MSQ and MTQ respectively.

Data from the field was analyzed qualitatively. Qualitative analysis involved making inferences from the teachers and students responses from the questionnaires. Qualitative analysis made use of descriptive statistics such as percentages and frequencies.

The findings of this study would be of significance to the teachers, students, curriculum developers, college tutors in educational institutions with regard to improvement of Mathematics performance and education. Change of attitude in both the students and learners will help to improve performance in Mathematics.

It was also revealed that teachers had a positive attitude towards teaching of Mathematics. However students had a negative attitude towards learning of Mathematics. This was seen as a factor that contributed to poor performance o f Mathematics.

Based on the above findings, the study recommended that schools should guide and counsel students on the importance of learning Mathematics. It was also recommended that schools should also try and motivate students and help them develop positive attitude towards the subject.

Taking the limitations and delimitations of the study, the researcher makes the following suggestions for further research: There was need to conduct a research to investigate on home background and its effect of student's performance. There was need to conduct a research to investigate how administrative factors that contribute to poor performance.

Key Words: *Students Attitude, Teachers Attitude, Poor Performance in Mathematics, Public Secondary Schools, Kenya National Examination Council*

INTRODUCTION

In today's world, the fields of technological and professional education require a strong foundation consisting of sound background knowledge of Mathematics. As technology develops and reaches more and more into all those levels of industry and commerce, so more Mathematics will be needed at all these levels.

The utilitarian value of Mathematics as man develops his technology, in endeavors to master his environment needs a lot of emphasis than it had been made before. The application of Mathematics is obvious or unconsciously done. But there is no doubt that well qualified mathematicians are in great demand (Mwangi, 1983).

In Kenya since independence, there has been a tremendous and a very remarkable trend towards the development of our educational system. There has been the need to relate science and technology to national goals for the overall economic development. This [y] has no doubt become central to educational development.

The Kenya Government also spends a large percentage of the annual budget on education (Wamahiu. 1977). Part of this money is channeled towards the improvement of Mathematics.

Statement of the problem

Secondary school students' poor performance in Mathematics in the K.C.S.E in Kenya has been an area of concern for students, parents, teachers, curriculum developers and the public in general. Mathematics is a compulsory subject for all Kenyan schools. It is the backbone of other science subjects and technology. However, the performance in Mathematics in K.C.S.E has been steadily deteriorating over the last few years. This has been of great concern to all education stakeholders. The failure rate has increased, for example 63.3% of candidates in 2002 obtained a grade "E" (which is a fail), this rose to 72.2% in 2001 and 75% in 2002 and it should not be surprising if it will be higher in the more recent years (KCSE analysis 2002).

Despite the national efforts made in developing a curriculum that is appropriate to the needs of this country, coupled with enormous teacher training efforts, performance particularly in Mathematics has been relatively poor and appallingly low all over the country and in general, a decline has been observed in the subsequent years.

Any remedial action to be taken requires the identification of the factors that contribute to poor performance in Mathematics. Although many people have done research in particular fields of Mathematics performance here in Kenya, they have not been able to find out the real causes of poor performance in Mathematics in secondary level. The main concern of this study is to find answers to the question, 'what are the factors that contribute to poor performance in Mathematics at K.C.S.E. level in secondary schools in Kiambaa Division of Kiambu District, Central Province?"

Objectives of the study

The general objective of the study was to investigate the students and teachers attitude as factors that contribute to poor performance in Mathematics at K.C.S.E level in secondary schools in Kiambaa Division of Kiambu District, Central Province. The specific objectives were:

- To investigate the students attitude towards Mathematics selected secondary schools in Kiambaa Division..

- To investigate the teachers attitude towards teaching of Mathematics in the selected secondary schools in Kiambaa Division.

Research questions

1. What is the student's attitude towards Mathematics in the selected secondary schools in Kiambaa Division?

2. What are the teacher's attitude towards teaching Mathematics in the selected secondary schools in Kiambaa Division?

Scope of the study

The study mainly dealt with Mathematics teachers and Form three students in stratified randomly selected secondary schools in Kiambaa Division. The schools were divided into three types; girls, boys and mixed schools. The three types of school were included in the sample.

THEORETICAL FRAMEWORK

a) Social learning theory

This study was based on social learning theory and operant conditioning theory. This theory emphasizes that learning takes place through observational learning and vicarious learning. People learn by observing the behaviours of a role model on the critical task, remembering the important elements of the observed behaviours, and then practicing those behaviours. The learner cognitively observes the model and imitates him/her. The behaviours observed may be many but only the ones that are reinforcing will be imitated. In vicarious learning, the behaviour increases or decreases by observing someone else being rewarded or being punished for the behaviour.

Bandura(1977) also acknowledges that behaviour is observable, measurable and predictable and at the end of the course the performance of Mathematics has to be evaluated. Behavioural modeling is a valuable form of learning because tacit knowledge and skills are mainly acquired from others in this way. This implies that the students learn by observing the behaviours of a Mathematics teacher on the critical task (Mathematics) remembering the important elements of the observed behaviours, and then practicing those behaviours. Behavioural modeling works best when the model (teacher) is respected and the teachers actions are followed by favourable consequences such as good results of Mathematics. If in the previous K.C.S.E. exams, the performance in Mathematics in K.C.S.E was encouraging to the candidates in form four they would also work hard in order to perform well in Mathematics as well.

Behavioural modeling also enhances observers' self-efficacy. This is the person's belief, that he/she has the ability, motivation, and situational contingencies to complete a task successfully. People with high self-efficacy have a "can do"' attitude towards a specific task. Behavioural modeling increases self-efficiency because people gain more self-confidence after seeing someone else do it than if they are simply told what to do. This is particularly true when observers identify with the model, such as someone who is similar in age, experience, gender, and related features. You might experience this when another student similar to you describes how she/he was able to perform well in Mathematics. You learn not only what has to be done, but that others like you have been successful at this challenge.

From the above information, it's quite clear that teachers have a great role to play to promote positive attitudes in students towards Mathematics, self-efficacy, motivate students and even reinforce behaviours that will improve Mathematics performance.

Donavan (1976) states that attitude plays an important role in the learning process of Mathematics. This means that teachers and all those involved in the education of students have a heavy responsibility in helping to create a favorable attitude towards Mathematics. Mathematics teachers should see to it that students are motivated to learn Mathematics. This would be made possible by use of reinforcements. Anytime a student performs well in Mathematics or greatly improves in his/her performance, they should be rewarded with prizes or taken out for an educational trip. Similarly, complements, should be used whenever a student answers questions in Mathematics. The teachers should go an extra mile and invite former students who performed very well to share their experience. This would be a great motivator, since the learners would be able to see that, if they also work hard they can perform well in Mathematics.

In addition, teachers should serve as role models to their students. As the students learn, they observe each and every move the teacher makes, the comments they make regarding the subject, commitment and dedication. The students adopt the behavior mannerisms of the teachers. Many educators believe that if the students have better role models in this case, the Mathematics teachers, they would be better adjusted and less likely to fail Mathematics (Bruner, 1966).

Another way students can be helped to like Mathematics and be able to solve problems in the subject is by use of mentors; here a more experienced person should be used to develop a one-to-one relationship with the students. The mentors should be successful adults in the community-, who would provide the students with a concrete image of who a student can become while offering guidance and support to enable the students to move toward better performance in Mathematics. The students may also visit the professionals at work like in the university department of Mathematics. This would encourage the students to have a positive attitude towards Mathematics and hence improve their performance.

Similarly, Mathematics teachers have a duty to build self confidence in their students in the subject. The students should be made to feel they are capable of passing and performing well in the subject. This would in turn promote their understanding and performance in Mathematics.

In addition, operant conditioning theory is based on the fundamental principle that we tend to repeat behaviours that are associated with reward and avoid those that are associated with punishment. This is what is meant by "Learning by consequences". The consequences or results of what we do generally determine if we will repeat the behaviour (Ochola, 1985).

Punishment is aversive stimulus to control behaviour (Donavan, 1976). Considering a learning situation, if students fail in a Mathematics test, they are made to repeat it, until they pass it. Next time they will do an examination they will work very hard so as to pass to avoid repeating. Reward usually states that it is some change in the environment which increases the likelihood of an organism repeating the behaviour that immediately preceded the reward (Kiragu, 1966).

Consequently, if students answer questions correctly in class and are rewarded, it is clear that they will be trying their best to answer questions correctly because they know they will get a reward for their answer. In addition, one way to understand reinforcement is to think of it as a reward. Macharia (1984) defines reinforcement simply as a stimulus event which if it occurs in proper temporal relation with the response tends to retain or increase the strength over response of a stimulus response connection. A stimulus

that makes the responses paired with it more likely to occur again is called a reinforcing stimulus. For example, if a student after passing in mathematics test is rewarded with a gift, the student works hard to pass the examination, we infer that passing of the examination is satisfying to the student and is thus a reinforcing stimulus, or reward.

Similarly, positive and negative reinforcement has a great impact on the learning and performance in mathematics by the students. Reinforcing stimuli that seem to give pleasure to the student are called positive reinforcements. These encourage the student to work hard in mathematics so that they perform well in it.

In addition Oluoch (2000) observes that Skinner came up with the different schedules of reinforcement. According to Skinner once a response is learned, it can be maintained without reinforcing it every time. Skinners reinforcement schedules include the following. The ratio schedules which involve the number of responses that must be made to gain a reward. The other type, the interval schedule, has to do with the time that elapses between reinforcements. Each type can either be a fixed or variable pattern.

In observing the fixed ratio schedules, a reward can be offered for a given number of acceptable responses. This means for every good performance in mathematics by students, they should be reinforced with a reward. This is a one-to- one reinforcement schedule. If a reward is given only on every fourth performance, this is a one-to-four schedule. Response rates on a fixed ratio schedule tend to be steady and high, if a reward is offered consistently. The student responds consistently by performing well in mathematics.

Another type of ratio schedules is the variable ratio schedules. The number of responses required before the students are rewarded can be varied, or changed. For example, a student may be rewarded after the first, the third, and fifth responses or the amount of the students reward can be varied. It may be one reward or two or six or seven. The student has no indication of when the reward is coming or how much it would be. This schedule would be a powerful one. With an unpredictable reward pattern, students never know when the big payoff might come, so they keep responding and working hard in mathematics so as to perform well in it. Many forms of gambling are examples of variable ratio scheme because there is occasionally a big pay off, the gambling response is reinforced.

In addition, under fixed intervals schedules, if students are rewarded at regular times, they would become more active and may start working hard and even looking forward to mathematics lessons. They would be responding to fixed interval reinforcement, a pattern that follows the bell. Responses during intervals" between rewards are not reinforced, so the students have learned that only those responses that occur at certain times get rewards.

Consequently with variable interval schedule, when the time between rewards is varied, the students are not aware whether a reward can be expected. Response rates tend to be low with this pattern of reinforcement, but they tend to be persistent. This however makes the students work hard and take the subject seriously for they know at least one time they will be rewarded for their good performance in mathematics which in turn contributes to good performance.

On the other hand, the students will learn to avoid a stimulus that is painful or unpleasant, such as avoiding failing to complete their mathematics assignment. Since they understand they will be retained in school after the others go home to complete the assignment. To avoid this

delay in school, the students will always make sure they complete their assignments on time. This is a reverse form of reward. In operant conditioning, desired behaviours (responses) are reinforced. Soon the students learn to make the responses required to receive reinforcement.

b) General attitude towards Mathematics

Neale (1969) describes an attitude as a state of readiness, a tendency to act or react in a certain manner when confronted with certain stimuli; it is typically conceptualized as being emotional feeling towards an object, a social institution or a group.

Another definition given by Krech (1987), states that an attitude is "an enduring system of positive or negative evaluations, emotional feelings, pro or con action tendencies with respect to a social object" (P. 120). Attitudes are not directly observable but are inferred from overt behaviour both verbally and non-verbally.

Mwangi (1983) notes that positive attitude towards learning is important because it affects students' motivation to learn, the quality of life within the school and continuing motivation not only to apply and utilize what has been learnt but also to seek out further related learning opportunities.

In addition, a number of studies conducted by Neale (1969) to study the attitudes of school teachers toward Mathematics show that attitudes towards Mathematics are gradually acquired through the students' interaction with the learning process and the curriculum. In a study by Dutton (1962), the researcher investigated the changes in attitudes of prospective elementary teachers towards arithmetic since 1954 in Canada. The study revealed that thirty eight percent (38%) disliked arithmetic; twenty four percent (24%) liked arithmetic fairly well. The study further showed that prospective elementary school teachers tenaciously hold positive attitudes towards arithmetic once developed.

Teachers' attitudes are believed to be an important factor in determining the teaching and learning of Mathematics. If a teacher's attitude is negative it may in turn affect learners and hence their performance. Cockroft (1982) noted that there was no area of knowledge where a teacher had more influence over attitude as well as understanding of his students than he did in Mathematics. A teacher of Mathematics may influence for good the attitude towards Mathematics of several thousands of young people and decisively affect many in their career choices.

This indicates that teachers attitude towards Mathematics has a great impact on Mathematics than any other area. Gatanzano (1977) giving his experience with prospective teachers noted that during his first few days of classes, prospective teachers had a tendency to make one or more of the following comments. "Mathematics has always been my poorest subject." or "I will never pass this course" such comments indicate to some degree the feelings and emotions of many of our prospective teachers towards Mathematics. Unless these prospective teachers' attitudes are changed, then the pupils taught by teachers with these feelings are likely to reflect the same attitude.

In addition Johnson (1972) notes that, it is the attitudes which are build that are highly involved in the learning and retention of the subject and its often the attitude the teacher builds that is the basis of their rank as successful teachers. This indicates that if a pupil develops a positive attitude then there are chances of liking Mathematics and at the same time performing in it are increased and vice versa. Therefore, it is the duty of Mathematics teachers to foster a positive attitude when teaching Mathematics and the

students will also be positive towards the subject therefore understand it and improve their performance in it.

Thuo (1985) further noted that, in Kenya, the student's attitude towards Mathematics expectations and aspirations contributed to achievement. The students who showed a positive attitude in mathematics spent more time on the subject hence performed better. It is therefore important that Mathematics teachers understand the attitudes of their students towards Mathematics. In doing so, they will help them develop positive attitude towards the subject. Attitudes are not innate but learned and can be modified by experience and persuasion. A student who dislikes Mathematics will avoid studying it and consequently perform poorly in the same. Teachers have a duty to develop student's positive attitudes towards Mathematics.

Students' feelings and perception about Mathematics is a major factor affecting his/her attachment and realization of full potential. Once students are motivated, they will no doubt develop positive attitudes towards both the subject and the teachers: and this will lead to the understanding of what they are taught. Donavari (1976) states that it is the attitudes that our students develop which are likely to stimulate or stop further study of Mathematics. Positive attitudes are highly involved in the learning and retention of the subject and it is often the attitudes teachers build that are the basis of their performance of Mathematics by their students.

c) Strategies of teaching Mathematics

Rukangu (2000) stresses that an educational system is directly related to the ability of its teachers. Hence the more qualified and better trained teachers are, the easier it is to effect curriculum implementation, no matter how distinguished the members of a project team are, how carefully structured a new course is, how brilliantly the various educational media have been exploited, the success or failure of any innovation ultimately lies on the receptiveness and flexibility of the classroom teacher.

This suggests therefore that the Mathematics teachers have to be conversant with various teaching strategies for different categories of students. Students exhibit different powers of understanding. For this reason, these varied individual differences will require different handling. Some are fast learners, others slow and yet others will require frequent repetition of the same concept in order for them to internalize it.

Kiswili (1995) says it is often suggested that Mathematics should be studied in order to develop powers of logical thinking, accuracy and spatial awareness. The study of Mathematics can certainly contribute to these ends but the extent to which it does so depends on the way in which Mathematics is taught. It is therefore important for the teacher to be well informed about what instructional methods to use for specific behaviours of students.

In addition, the instructional methods used by the teachers are an important factor in the Mathematics education and should know how to involve students' active participation. This could be achieved by using varied strategies including problem solving. We notice that when the lesson is teacher dominated, the teacher largely uses the expository method instead of both expository and heuristic. Expository method does not involve the learner's participation, whereas Mathematics requires a lot calculations, participation motivation and practice.

Performance in mathematics at KCPE and KCSE more than any others subject taught in schools, require that the learner understands sequentially

and hierarchically organized systems of prepositions which calls for continuous training of Mathematics teachers and tireless practice of learners. However, due to poor foundation in Mathematics at primary-level, pupils who excelled in the examination (KCPE) perform poorly in the subject at secondary school level.

This is because the pupils are taught to aim at reaching the correct answer without necessary understanding the mathematical process. When they reach secondary school and are left to think and reason mathematically on their own they cannot cope.

STUDY DESIGN AND THE METHODOLOGY

Research design

The selected study design was descriptive survey. The descriptive research is designed to obtain pertinent and precise information concerning the current status of phenomena and wherever possible, to draw valid general conclusion from the facts discovered. This study would therefore investigate the current situation as concerning factors contributing to poor performance at KCSE in Mathematics in Kiambaa secondary schools in Kiambu District.

The method which was involved in this study was non-experimental, as it deals with the relationships among non-manipulated variables. The relevant variables were selected and analysed for any relationship.

Sapling technique

This section entails the sampling techniques, the methods of getting the sample size. Form three students together with their teachers were the source of information from the selected public secondary schools in Kiambaa Division. Different sampling techniques were applied to select different samples as follows:

Location o f study

The study was conducted in public secondary schools within Kiambaa Division in Central Province of Kenya. At the time of study, the area had several secondary schools that were evenly distributed. The choice of research in this Division for study was influenced by the fact that mathematics is poorly performed here as per analysis by the Kenya National Examination Council (K.N.E.C, 2002), despite the District having national schools, provincial and District schools. This necessitated the research to be conducted to actually find out what were the factors contributing to poor performance in Mathematics in the Division.

Study population

The target population of this study consisted of all the public Secondary schools in Kiambaa Division. According to the Kiambu District Education Office, the Division had a total of 40 secondary schools both private and public. The study population was made up of 6 public secondary schools.

Secondary school Mathematics teachers and form three students from these public schools took part in the study. In Kiambaa Division, either a boy's school, girl's school or mixed school were considered.

Sampling techniques and sample size

Description of instruments

Data for this study was collected using the following instruments: -Mathematics Teachers' Questionnaires (MTQ) and Mathematics Students' Questionnaire (MSQ). The first questionnaire was administered to the teachers and second to students.

The Mathematics teacher's questionnaire (MTQ) was designed by the researcher to establish the factors, which according to the teachers contributed to poor performance in Mathematics. The questionnaire had 4 parts. Part 1 was on General Information about the teacher and the school. Part 2 was on level of motivation. Part 3 dealt with teaching and learning resources, and part 4 had a Likert type scale with 10 items on attitudes. The questionnaire had both closed and open ended questions on attitudes towards Mathematics, motivation, and learning resources and facilities.

The Mathematics Student Questionnaire (MSQ) was divided into 2 parts. Part 1 required the students to give personal information and about the school. Part 2 required information about teaching and learning resources, part 3 was on instructional methods employed by teachers while part 4 was a Likert type items on attitude of students towards Mathematics. The questions were open ended and one on a five point scale. The questionnaire also sought to find out ways on how performance in Mathematics could be improved.

Data collection and procedure

Preliminary visits to sample schools were made by the researcher after obtaining permission to carry out the research as well as introductory letters to the head teachers. During this time, the researcher briefed the head teachers and the teachers on the purpose of the study. A date was also given when the actual administration of the instruments was to be done. Respondents were required to fill in the questionnaires. And hand them in to the researcher

Data analysis

This study generated both qualitative and quantitative data. Because of its nature the data was analysed using descriptive techniques of data analysis. Data was first coded and entered in the Statistical Package for Social Sciences (SPSS) computer software for windows programme to enable analysis. Frequencies (f), percentages (%), obtained were used to answer the research questions one, two, four and four.

To answer research questions 3 and 5 the Likert type items on attitude were used. Items were graded in the following using the following key: Strongly Agree (SA) was awarded 5 points, Agree (A) 4 Undecided (U) 3. Disagree (D) 2. Strongly Disagree (SD) was awarded 1 point. Alternative Items were graded in the opposite with reversed keys so that Strongly Agree (SA) 1 point, Agree (A) 2 points, Undecided (U) 3. Disagree (D) 4 and Strongly Disagree (SD) 5 points. Reversing the scoring of the negative items has the advantage of reflecting positiveness towards the object in question (Nyaga. 1997).

The maximum score possible was therefore 5 points x 10 items = 50 representing perfectly positive attitude. On the other hand, the lowest score was equal to 10, that is, 1 point for 10 items, representing perfectly negative attitude. A perfectly neutral level was represented by a score of 25 (Nyaga. 1997).

RESULTS AND DISCUSSION

Completion rate

Completion rate is the proportion of the sample that participated as intended in all the research procedures. In this study, out of the 16 teachers sampled, all of them (100%) completed and returned the questionnaires. Out of 80 students sampled all of them (100%) filled and returned the questionnaires.

Demographic information

Demographic information of the Mathematics teachers

Demographic information of Mathematics teachers was based on their gender, name of

school, type of schools, number of students in their classes, their highest professional qualifications, the duration of time they had been teaching Mathematics, whether they had been trained in Mathematics and their teaching load. To establish their gender they were asked to indicate the same. Findings revealed that 8 (50%) were male while the same number 8 (50%) were female. This shows that the researcher had a balanced sampling as proposed in the sampling techniques. The teachers were further asked to indicate the type of schools that they taught.

The rest of the classes had different number of students. However, there were classes that had a considerable high number of students which exceeded 50 in a class. For example there was a class which had 65 students, 54 students and also 48 students. When teachers have many students it becomes difficult for them to teach effectively. When handling many students, teachers were not willing to give assignments since it would be difficult for them to mark. It was also difficult for teachers to cater for individual problems of the students. Teaching involves practical teaching in the classroom and also giving out assignments. Subjects such as Mathematics need a lot of practice and it is usually advised that students should be given assignments at least every day. High number of students will discourage teachers from giving assignments for fear of consuming too much time in marking the student's books. It is apparent therefore that students in Kiambaa Division were not taught effectively due to their large numbers per class. This therefore was a factor which contributed to poor performance in Mathematics.

The study also wanted to establish the teacher's professional qualification. Teachers were also asked to indicate the same.

Professional Qualifications of Teachers

The findings showed that majority 9 (56.3%) were Graduate Trained teachers. 2 (12.5%) Mathematics teachers were Approved graduate teachers, 4 (25%) were Diploma holders and 1 (6.3%) held a Post Graduate Diploma in Education. This shows that all teachers were qualified to teach in secondary schools. The fact that majority were graduate trained teachers could be attributed to the fact that, for one to teach in a secondary school one usually must hold a Bachelor of Education Degree. The results therefore show that majority were qualified to teach in secondary schools. This implies that teacher's qualifications were not a factor leading to poor performance in Mathematics in school in Kiambaa Division. This further suggests that there are other factors leading to the same. Teachers were further asked to indicate the subjects they taught. Their responses indicated that they all taught Mathematics and another subjects. They were further asked whether they had been trained in the subject that they taught. Data from their responses showed that they had been trained in the subjects that they taught. This shows that Mathematics teachers in the sampled school were qualified and had been trained in Mathematics. This further implies that qualification of teachers was not a factor that led to poor performance since all of them had been trained.

The Mathematics teachers were further asked to indicate the duration of time that they had been teaching Mathematics in their teaching profession. The findings are presented in Table 1. Data presented in 1 shows that most of the teachers, 7 (43.8%) had been teaching the subject Mathematics for between 6 and 10 years, 6 (37.5%) had been teaching for between 1 and 5 years and the rest 5 (31.3%) had been teaching Mathematics between 11 and 15 years.

Table 1 Duration of time that teachers had been teaching Mathematics in their teaching profession

Duration of time	F	%
1 - 5	**6**	**37.5**
6 - 1 0 years	**7**	**43.8**
11 - 15	**5**	**31.3**
Total	16	100

This shows that majority of teachers had a considerable long experience in teaching Mathematics. The experience acquired by the teachers was important in this study in that teachers were able to give information on the causes of poor performance in the subject. The teachers were further asked to indicate the duration of time that they had been teaching Mathematics in the respective schools.

Finding revealed that some teachers had been teaching mathematics for a considerable long time. For example 2 (12.5%) had been teaching mathematics for 22 years. 1 (6.3%) had taught Mathematics for 14 years, 3 (18.8%) had taught for 12 years, one had taught for 16 years, another for 11 years and another for 10 years. However 1 (6.3%) teacher had taught for 2 years and another teacher had taught for 3 years in the current school. The long duration of time that teachers had taught Mathematics is important in this study in that, these teachers could give reliable information on why the subject Mathematics had been poorly performed by students in the school.

The research also wanted to establish how teachers' teaching load affected students performance in Mathematics. Teachers were therefore asked to indicate their teaching load per week their findings are presented in Table 2

Table 2 Teachers' responses on their teaching load

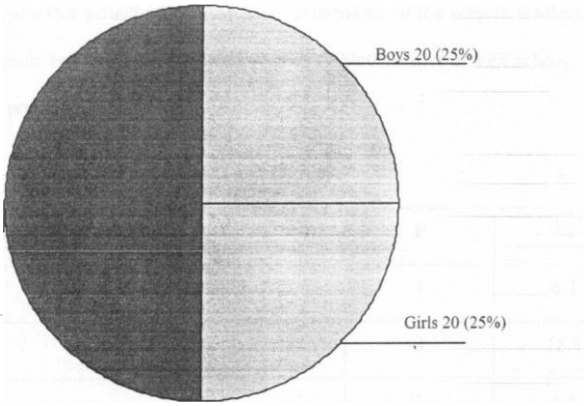
Teaching Load	F	%
25 - 30 lessons	**4**	**25**
3 1 - 3 5 lessons	**5**	**31.3**
36 and above	**7**	**43.8**
Total	16	100

Findings in Table 2 indicated that 4 (25%) teachers said their teaching load was between 25 and 30 lessons a week, 5 (31.3%) said they had between 31 and 35 lessons per week while 7 (43.8%) said they had 36 lessons and above. When they were asked to comment about the teaching load, 4 (25%) said it was moderate to cope with. 5 (31.3%) said it was a bit hectic to deal with especially when the classes were too large. Seven (43.8%) said it was too heavy for them and this affected their performance. Most of the teachers 7 (53.8%) therefore felt that the teaching load was heavy. Teachers tackling many lessons were not able to perform their teaching effectively. This may be a great cause of poor performance in the subject. After establishing the demographic information of teachers, the researcher turned attention to the demographic information of the students' respondents.

Demographic information of the students

Demographic information of students was based on students' responses on name and type of school and their gender. To find out their gender, the respondents were asked to indicate whether they were male or female. Their responses showed that 40 (50%) were male and the same number 40 (50%) were female. This shows that the students sample was balanced in terms of gender. They were further asked to indicate the type of school that they were in. Figure 4.3 presents the type of school as presented by students.

Figure 1 type of school



Data in Figure 1 shows that 40 (50%) students were from mixed schools, 20 (25%) were from boys school and the same number from girls school. This shows that the sampling of schools was balanced where that all the categories of school were well represented. This is important in that the researcher would get the views of students from different categories of schools.

Factors contributing to poor performance in Mathematics

Attitude of students towards Mathematics

In an attempt to determine the attitude of students towards Mathematics, students were asked to indicate whether they strongly agreed, agreed, were undecided, disagreed or strongly disagreed with items regarding Mathematics. Table 3 presents their responses.

Table 3 results of the attitude of the students' toward learning mathematics

Data presented in Table 3 shows that majority of students (72.5%) had a negative attitude towards

Range of scores	Category of Attitude	No. of students per category	% of students
1 - 10	Negative	58	72.5
U - 2 4	0	0	0
25	Neutral	-	-
26-50	Positive	22	27.5
	Total	**80**	**100.0**

Mathematics. **A** smaller percentage of them (27.5%) said they had a positive attitude towards Mathematics. Negative attitude towards a subject may lead students to performing poorly in the subject. It therefore shows that students had a negative attitude towards various areas in Mathematics such as liking Mathematics, seeing it as a dull subject, not caring whether they failed or not, teachers favoring some students and being forced to do Mathematics.

Attitude of teachers towards Mathematics

To investigate the attitude of teachers towards Mathematics, teachers were asked to indicate how they strongly agreed, agreed, were undecided, disagreed or strongly disagreed with items regarding Mathematics. Their responses are presented in Table

Table 4 **Teachers' attitude towards teaching**

Range of scores	Category of Attitude	No. of students per category	% of students
1 - 10	Negative	**3**	**18.7**
1 1 - 2 4	**0**	**0**	**0**
25	Neutral	-	-
2 6 - 5 0	Positive	**1 3**	**81.3**
Total		16	100.0

From Table **4** it can be seen that majority of teachers **(81.3%)** had positive attitude towards teaching Mathematics. Only a small number **3 (18.7%)** of them had a negative attitude. Most of them therefore deemed different areas in Mathematics as easy. The attitude of teachers towards the subject shows that they were ready to assist students in the learning of mathematics. This shows that teacher's attitude is not a cause of poor performance in Mathematics. Attitude has been found to account for variation in performance of a given subject. Positive attitude towards a subject increases motivation in learning hence high achievement. Whereas negative attitude towards it may consequently lead to poor performance, the finding above that students have a negative attitude towards Mathematics may be a factor that contributes to poor performance in the subject. Similar results were obtained by Caroll (1967) and Spolky (1968)

who say that negative attitude towards a subject has a repercussion in contributing to poor performance. The findings are also in line with Musango (1982) who found out in a research conducted in Uganda that there was a positive relationship between attitude towards a subject and performance in the subject. Negative attitude can therefore be said to be one of the factors contributing to poor performance in Mathematics among students in Kiambaa Division.

The respondents were also asked to indicate the extent to which attitude, entry behaviour, interest in the subject, poor background, lack of text books and poor teaching methods applied by teachers affected performance in Mathematics. Table 4.13 presents the findings.

Table 5 factors contributing to poor performance in mathematics

Factor	Great extent		Lesser extent		Least extent	
	f	%	F	%	f	%
Negative attitude that Mathematics is difficult	13	81.3	2	12.5	1	6.3
Poor entry behaviour	14	87.5	2	12.5	-	-
Lack of interest in Mathematics	15	93.8	1	6.3	-	-
Poor background in Mathematics	16	100	-	-	-	-
Lack of text books	2	12.5	5	31.3	9	56.3
Poor teaching methods by teachers	1	6.3	1	6.3	14	87.5

From Table 5 teachers rated attitude towards Mathematics very highly as a great contributor to poor performance in Mathematics. 13 (81.3%) said that negative attitude towards the subject contributed to poor performance to a great extent, 2 (12.5%) said it contributed to a lesser extent and 1 (6.3%) said it contributed to a least extent. It was also revealed that poor entry behaviour was also a great contributor to poor performance in Mathematics. In this item, 14 (87.5%) said it contributed to a "great" and 2 (12.5%) said it contributed to a "lesser" extent. All the teachers 16 (100%) said that poor background in Mathematics contributed to a great extent to poor performance in Mathematics. However, majority of the teachers 9 (56.3%) said lack of textbooks was not a great contributor to performance in Mathematics. This shows that schools did not have problems with textbooks. This confirms the previous finding that textbooks was not a major problem in the selected schools. Teachers also reported that poor teaching methods was not a contributor to poor performance in Mathematics, where 14 (87.5%) said it contributed to the least extent. This shows that teachers used the appropriate methods of teaching.

Ways of improving performance of Mathematics

The researcher wanted to establish ways in which performance in Mathematics could be improved. Teachers were therefore asked to give their recommendations. Table 6 presents their responses.

Table 6 Teachers' responses on ways of improving students' performance in Mathematics in schools

Way of improving performance	F	%
Need to guide and counsel students on importance of Mathematics	5	31.1
More assignments should be given	3	18.8
Teachers should use different teaching methods	4	25
Students should be motivated to learn Mathematics	3	18.8
Provision of teaching learning materials	1	6.3
Total	**16**	**100**

Way of improving performance	F	%
Teachers should motivate students to take Mathematics positively	14	17.5
Teachers should give assignments and mark them in time	18	22.5
Teachers should use different teaching methods	13	16.3

School should provide the necessary materials	10	12.5
Group discussions should be encouraged	9	11.3
Students should be induced to like Mathematics once they come to Form one	16	20
Total	**80**	**100**

Data presented in Table 6 revealed that among the recommendations given by teachers, 5 (31.1%) said that there is need to counsel students on the importance of learning Mathematics, 3 (18.8%) said that students should be given more assignments, 4 (25%) said that teachers should use different teaching methods, 3 (18.8%) said that students should be motivated to learn Mathematics and 1 (6.35) said that there should be provision of teaching and learning materials.

Data from students responses revealed that 14 (17.5%) said that in order to improve performance in Mathematics, teachers should motivate students to take Mathematics positively, 18 (22.5%) said that teachers should give assignments and mark them in time, 13 (16.3%) said that teachers should use different teaching methods, 10 (12.5%) said that schools should provide the necessary materials, 9 (11.3%) said that group discussions should be encouraged and 16 (20%) said that students should be induced to liking Mathematics once they come to Form One.

SUMMARY OF FINDINGS

The study revealed that there were a number of factors that contributed to poor performance of Mathematics in Kiambaa Division. It also revealed that most schools had large classes and high number of students. This was found to affect teachers' performance negatively hence affecting performance. It was also revealed that a number of schools did not have enough teaching and learning materials which was a factor leading to poor performance. Some teachers did not prepare themselves adequately to teach and also used improper teaching strategies such as question and answer method and lecture method. Findings on student's motivation revealed that students were not motivated to learn Mathematics where most of them had the opinion that Mathematics was a difficult subject. This had been created by their background in the primary school. The study also established that teachers had a positive attitude towards teaching of Mathematics. Teachers' attitude towards Mathematics was not therefore a contributing factor to poor performance. However students had a negative attitude towards learning of Mathematics. This was seen as a factor that contributed to their poor performance in Mathematics.

Implications of **the findings**

Findings from this research imply that poor performance in Mathematics in Kiambaa Division is a major concern. Availability of teaching, learning materials and resources, students motivation, and attitude of teachers and students towards teaching and learning of Mathematics, instructional methods employed by teachers were some of the factors that contributed to poor performance.

Conclusions

The study intended to investigate the factors contributing to poor performance of Mathematics in Kiambaa Division of Kiambu District. Five research questions were formulated to guide in the study. Research question one was to find out the qualification of teachers and how it contributed to poor performance in Mathematics. Research question two sought the find out the availability of teaching and learning facilities in the sampled schools, research question Three aimed at establishing the student's attitude towards learning of Mathematics. Question Four wanted to

investigate the extent to which student's level of motivation contributed to poor performance and research question five wanted to find out the attitude of teachers towards teaching of Mathematics. The study employed descriptive survey design.

Teachers had a large work load which lowered their effectiveness in teaching of mathematics. The Ministry of Education recommends a maximum of 32 lessons a week. When teachers have above that number it will be difficult for them they have time to give and mark assignments, prepare for their lessons. This therefore could be a factor leading to poor performance in the subject.

Teachers had a positive attitude towards teaching of Mathematics, while students had a negative attitude towards learning Mathematics which mainly contributed to poor performance in the subject.

Recommendations

Based on the above findings, the following recommendations were given by the respondents.

- That schools should guide and counsel students on the importance of learning Mathematics.
- Schools should also try and motivate students and help them develop positive attitude towards the subject.

Suggestions for further research

Taking the limitations and delimitations of the study, the researcher made the following suggestions for further research:

- There is need to conduct a research to investigate on home background and its effect on students' performance.
- There is need to conduct a research to investigate if administrative factors contribute to poor performance.

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