

A Study of factors that Influence poor Performance in
Mathematics in Secondary Schools by Female Students in Nairobi

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A Research Project report Submitted in Partial Fulfillment of the
Postgraduate Diploma in Gender and Development to the
University of Nairobi, Institute of African Studies.

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Declaration

This is my own original work and it has not been presented to any other University for any award.



Judy Wathata Kinyua

This research project report has been submitted to the University for Examination with my approval as a University Supervisor.



Dr. D.M. London

Dedication

This project is dedicated to my loving husband Christian Gatheru, my children Chiru and Mahinda; and parents for their encouragement.

Acknowledgements

I wish to thank my University Supervisor Dr. D.M. London for having guided me and in this project work. His guidance and advice went along way in ensuring that the project work took the present form. I appreciate greatly criticisms and comments made all along.

I wish also to acknowledge and appreciate the support extended to me from colleagues at college and students from different institutes who actively participated in the actual project work.

I wish also to thank my family members for their patience and understanding during the time that I was undertaking this project.

Lastly I wish to thank Lady Catherine Mbathi who tirelessly typed this project work. Keep up the spirit lady Catherine.

Abstract

This study aimed at investigating the factors that influence the performance of mathematics among girls in high schools. Specifically study investigated the contribution of both the teachers and girls in the overall performance in Mathematics.

This study was conducted in Nairobi Province sampling female students enrolled in various commercial colleges in Nairobi. Data were collected using a standard questionnaire. In addition, scheduled interviews were administered to key the informants. Data were analysed and findings summarized in tables.

A total of 46 female students responded to the questionnaires. 10 mathematics teacher from different schools were interviewed as key informants. In addition, informal discussions were held with 4 teachers from different school. The main findings of this study were that the number of female teachers in mathematics was lower than that of men.

It was also found that girls had a negative attitude towards mathematics and termed their performance as fair.

The study revealed that the girls had some difficulty in comprehending mathematical terms right from primary level.

In light of some of the above named problems and others which the researcher felt greatly hampered the implementation and effective teaching of mathematics, the researcher came up with some recommendations on how some of the problems can be overcome. This includes a great need and desire

to invite more mathematics oriented and professional women in mathematics to talk to girl students in secondary schools and show them that the subject is not hard and is not only meant for boys.

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CHAPTER ONE

INTRODUCTION

In Kenya, like most parts of the world where schooling is not indigenous, traditional cultural expectations often conflict with the expected outcomes of formal education, which is an important asset to everybody, regardless of ones socio-economic gender status.

Education is one of the most important agents for development and is an important tool for empowerment of changes in human behaviour through knowledge acquired. It is essential as it enables girls and boys to be informed about their health, employment and welfare among other things.

Lack of education prevents young men and women from fulfilling their potential and contributes to a sense of low esteem.

The socio-cultural factors negatively affect the girls' academic performance. These include the prevailing cultural expectations, norms and traditional attitudes that restrict female achievement, mobility and opportunity.

Culturally determined attitudes towards the girl - child, influence how families' resources are allocated towards the education of girls as compared to the boys. A boy will always be considered first and better in mathematics because, a girl is considered to be a "lesser - child". This has a direct bearing and influences the performance of the girl - child in mathematics.

Girls in Kenya grow up in a male dominated society in which they are constantly reminded of their relative weakness, inferiority and inequality with men. The amount of time girls are required to spend on domestic tasks and other productive activities reduces the time and energy they have to spend in school hence affecting their attendance, performance, and consequently their attainment.

School environment including teachers negative or stereotyped attitudes about the mathematics potential of female students as well as a few female teachers to act as role models has negatively affected female students performance in secondary schools in Kenya.

The poor performance of these girls has been attributed to the poor background they have in their primary schools.

The idea of poor performance in mathematics is critical, as most students who leave school with poor performance in mathematics cannot compete effectively in the job market with others who have performed well.

The views on this poor performance are many and valid. Some are centred on poor subject foundation, lack of interest on the part of the students and lack of textbooks etc. The aim of this research is to try and find out factors that negatively influence students' achievements in mathematics. The study is therefore centred on finding out some information about the problems and difficulties that are experienced by girls while learning mathematics.

Education for all children is essential for sustained development because it brings socio-economic benefits from both to the individuals and to their society. This study will be confined to a number of college students in Nairobi Province. In the context of this study, problems facing girls in their mathematics attainments and the strategies to overcome them were established.

My interest in the poor performance in mathematics by female students, is generated from my ten years teaching experience as a mathematics teacher. During this time I often wondered whether girls interest in mathematics had anything to do with their past. As well, I was concerned about the girls lack of interest in pursuing University education in **Mathematics** / Science departments.

1.1 STATEMENT OF THE PROBLEM

Mathematics is a very important subject in the 8:4:4 system of education, since it helps in imparting relevant skills for technological development or in the promotion of creative and critical abilities.

Up to secondary school level, mathematics is a compulsory subject and a vital requirement for most post secondary courses and other higher educational opportunities.

The purpose of this study was to investigate the problems and difficulties encountered by girls while learning mathematics and resulting to their poor performance. The study also sought to identify and distinguish the factors that affect the girl – child's performance in mathematics and focused on the educational related problems that they face at home, in school and in the community. The study will attempt to answer the following research questions.

1. Is there a relationship between socio - economic factors and the low achievement in mathematics by the girl - child in secondary schools?
2. Is there a relationship between sex role ideology and the low achievement in mathematics by the girl child?
3. Is there a relationship between role models and low achievement in mathematics by the girl - child?
4. Does the nature of school administration contribute to poor performance in mathematics?

1.2 JUSTIFICATION OF PROBLEM

Education is a human right and an essential tool for achieving the goals of equality, development and peace. Equal access to and attainment of educational qualifications is necessary if people are to become agents of change and development.

Literacy is an important key to improving health, nutrition and education in families as well as a means to empowering both men and women to participate in decision-making in society. Investing in education has proven to be one of the best means of achieving sustainable development and economic growth that is both sustained and sustainable. More so mathematics is very important to girls because it gives them a wide range of choices for the job description and thus getting better paying jobs.

According to the forth world conference on women (1995) subject choices has stereotyped attitudes about what subjects are appropriate and proper for females and males. This leads to the channelling of girls and boys into specific and often limited field at study. Subject typing denies girls and women access to a wide choice of fields as they are concentrated in arts based subjects. Thus mathematics being compulsory, the girls end up performing poorly since it was not their choice.

This makes women to get lowly/poorly paying jobs like secretaries, teachers and nurses. That has confined them in a miserable state, as they are not economically viable/empowered. Thus limiting their otherwise important contribution to the community in general.

1.3 RESEARCH OBJECTIVES

The main objective of this study will be to identify and determine factors that influence the poor performance in mathematics by female students in secondary schools. Specifically the study sought to:

1. find out socio-economic factors that influences low achievement in mathematics by the girl - child in secondary schools.
2. Investigate whether the sex-role ideology influences low achievement in mathematics by the girl - child in secondary schools.
3. determine if the number of role models influence the low achievement in mathematics by the girl -child in secondary schools.
4. investigate whether the nature of school administration contribute to poor performance in mathematics by the girl – child in secondary schools

1.4 STATEMENT OF HYPOTHESIS

In trying to answer the questions posed in the research, the following null hypotheses will be tested.

1. The socio-economic factors influences the low achievement in mathematics by the girl - child in secondary schools.
2. The sex role ideology influences the low achievement in mathematics by girl - child in secondary school.
3. The number of role models influences the low achievement in mathematics by the girl - child.
4. The nature of school administration contributes to low achievement in mathematics by the girl – child in secondary schools.

1.5 LIMITATIONS OF THE STUDY:

The study met with a number of constraints which affected both its comprehensiveness and depth.

- Time factor was a constraint. This made the sample size to be small where there was the random sampling.
- Finance was also another constraint as the researcher had to cater for practically all the financial needs and demands, but this was catered for by taking an emergency loan to cater for those financial needs.
- Time was also a constrain since the study was done alongside a very tight schedule of full time work but this was catered for by taking some days off duty during the study.

1.6 OPERATIONAL DEFINITIONS.

Examination performance - refers to various grades that school children score in a number of tests, which they take in the course of their learning.

Community - refers to general public.

Household - refers to people living under the same roof and/or eating from the same kitchen.

Early Marriage – The giving out of a female aged under 18 years for matrimony usually after circumcision

Culture - Set of norms attributes, beliefs, and customs etc, accepted by a community that guides its day to day activities.

Chapter Two
Literature Review

2.0 Introduction

A lot of written materials exists and tries to analyse why students continue to perform poorly in mathematics. Research into this area is of major concern as many scholars and researchers have realised the importance of the subject not only in schools but also in everyday life.

Many scholars have enlisted the view that a poor performance or a failed grade in mathematics renders one to be a passive consumer of the new technology.

The researcher knows that there are a number of factors that could easily contribute to poor performance in mathematics by girls. But this view is centred on the role of the textbook, role of teachers, teaching aids, school administration, the role of discipline among students', negative attitude towards mathematics and socio-cultural factors.

This chapter has reviewed literature on the following broad themes:-

- i) Role of the textbook
- ii) Role of adequate teachers in mathematics
- iii) Role of teaching aids
- iv) Teachers attitudes towards mathematics learning in schools
- v) Girls negative attitudes towards mathematics
- vi) Role of school administration
- vii) Role of discipline among girls.
- viii) Role of socio-cultural factors

2.1 *Role of the Textbooks*

Textbooks are useful for further reading, for preparing lesson plans, diagrams, illustrations, exercises and even for instructions to be given to students. Textbooks have a very significant contribution to the teaching learning process in school. The textbooks are useful to the students for their further practice.

Due to lack of textbooks, learning of the subject is hampered in a great way since it's supposed to act as a surrogate teacher and provider of supplementary reading. The textbook being proper, the student has to play his / her part by adopting "good" reading habits, and this makes the student self dependent in acquiring knowledge and skills. (Newton; 1984)

2.2 *Role of the Adequate Teachers in Mathematics*

"There is a severe shortage of qualified mathematics teachers in most secondary schools in Kenya (UNESCO source book 1970)

It was also noted that there was high turnover of teachers from this subject area to other well paying jobs in other sectors. Though the Kenya government through the Ministry of Education have realised this problem and have improved the terms of service for teachers teaching mathematics, the problem still persists.

Lack of sufficient teachers in this subject could hamper the efforts of proper teaching of the subject in our schools. Lack of teachers who are facilitators of teaching / learning process could also defeat the Government's policy of making Kenya an industrialised self-country by the year 2020.

2.3 *Role of Teaching Aids*

Teaching and learning is not restricted to one mode of sense. Teaching aids thus play a vital role in teaching mathematics.

Writing on this issue Jensen (1985) commented that the visual charts are suitable for illustrating certain mathematical concepts, which help children to develop visual perceptual skills, which will be used to identify and recognise shapes and colours. Jensen continued to say that audio visual teaching aids form an integral part of learning and as the saying goes "a real thing is far better than a mere description of the thing" (Jensen, 1985). Therefore teaching materials should be developed to improve the self-image, lives and work opportunities of girls, particularly in areas where women are under represented, that is mathematics, science and technology.

2.4 *Teachers Attitudes Towards Mathematics*

According to Mutungi (1984) a teacher's positive attitude has been shown to attract more girls in their class and hence promote positive attitude in girls towards the subjects they are teaching.

Girls' attitude on the other hand is influenced and shaped by teachers' characteristics and approaches. A teacher can promote desirable attitudes.

According to FAWE 1999, teachers in their professional or personal life, view girls in school as not being bright as boys, not working hard as boys and seem to loose interest in school in general after a few years. This creates an even greater problem in mathematics, where girls not only appear to perform poorly but very few study at all. Thus only a small number of girls opt to this subject at secondary level, let alone university.

Some teachers have negative or stereotyped attitudes about mathematics potential of female students and there are too few female teachers to act as role models and counsellors for girls. Teachers should not give girls an impression that mathematics is a difficult subject only fit for the gifted few.

2.5 *Girls Negative Attitudes Towards Mathematics*

Mutungi (1984) defines an attitude as a mental and neural state of readiness, organised through experience exerting a directive or dynamic influence upon the individuals response to all subjects and situations with which it is related.

From this definition it is therefore very clear that an attitude of a student plays an important role in learning, in that it determines direction and action of influence.

If girls' attitude is negative or positive then this will adversely affect the learning of the subject. Most girls in most schools have negative attitudes towards the learning of mathematics and this affects their performance in the subject.

2.6 *Role of School Administration*

School administration may seem to be remotely related to achievement. Close examination of schools which consistently perform well reveals that these are schools with sound and efficient leadership.

According to FAWE 1999, an efficiently managed school can provide the right environment for both teachers and students. In this case unless

teachers respect girls and support them they will not perform well in mathematics. This is because they will need a lot of help from the teachers as they do their practice. There should be a single – sex classes for mathematics and sciences, which have been found to be a successful strategy by FAWE in improving mathematics performance by the girl students.

A head teacher carries considerable responsibility and authority within the Kenyan education system where he/she plays the supervisory and leadership role both of which involve decision-making.

The administrative climate under this decision-maker suppresses the ambitions and professional growth of teachers where a teacher's freedom of expression is curtailed and results in the teachers being reserved in issues where his contribution would have been vital for the good of the school.

An effective head teacher knows how to co-operate with his teachers where he co-ordinates their efforts to bring about a proper school atmosphere conducive to learning. These teachers should be the ones to recommend in consultations, perhaps with their heads of department on textbooks, and other teaching materials for the learners.

Writing on this issues Mbiti (1974) says that it is important because a curriculum design has practical meaning when a school has the required support materials which are in form of textbooks, exercise books, manila papers, chalks, audio visual aids and other teaching materials.

The supply of such support materials is under the head teacher's jurisdiction of financial management. Mbiti continues to say that such supplies must be supplied in good time, in adequate quantities, and in the appropriate form for the syllabus needs so as to benefit learners.

2.7 Role of Discipline Among Girls

Discipline problems are a major cause of teachers' ineffectiveness and many teachers' who leave the teaching profession do so because they are unable to maintain a disciplined classroom environment.

Mathematics requires attention, concentration and the girls' involvement in each lesson. This can only be achieved in a disciplined classroom. Extremely noisy, unstructured and undisciplined classrooms are not good or conducive to good and proper learning.

Schielfelbein and Simmons (1981) have shown in their review of research on determinants of school achievements that there is a high correlation between the out - to class academic work and achievement. In this, if the girls are not disciplined, then the out - of - class academic work is never taken up and thus cannot be effective. Due to this neither the pupils nor the teachers take their homework seriously.

Discipline of girls is therefore a crucial factor in determining effective learning in mathematics.

2.8 Role of Social - Cultural Factors

According to Forum for African Women Educationists (FAWE, 1996) school and classroom environment as well as socio-economic and socio-cultural factors greatly affect the girls' academic performance. These include the prevailing cultural expectations and traditional attitudes that restrict female achievement. Likewise the amount of time girls are required to spend on domestic tasks reduces the time and energy they have to spend in school

thus affecting their performance. Since mathematics requires a lot of practice, which they do not do, they then end up performing so poorly. In most cases boys study as girls work which is a negative attitude about the value of girls education.

FAWE has shown that poor health or under nourishment can lower a ones ability to study. Research findings suggest that there are gender disparities in the nutrition and health status in favour of boys thus having a negative impact on girls' performance, and achievement in school.

Chege (1983) in his research on the education for Maasai girls found out that availability of school is not the major factor of measuring educational opportunities but that the ability to use the existing facilities is equally important. However this in turn depends on the socio economic background of the girls.

Chege found that educational background and occupation of parents as well as that of the eldest family members are important factors that influence both participation and performance rates of girls in school. In some instances parents have adequate financial ability but their negative attitudes towards education deters them from meeting the education costs which may then, have a great impact in enrolment of children in education. For instance Mbilingi's (1970) paper on "Traditional attitudes towards women" in Tanzania has highlighted that most parents would rather educate boys than girls if they were asked to priotize on utilization of scarce resources of educational purposes. In this case the parents perceived education of boys as having higher returns to the family in comparison to girls education. In this case the

parents do not encourage the girls in their performance thus they end up performing poorly.

Chapter three

Methodology

3.0 Introduction.

The study is based on a case study of commercial colleges in Nairobi Province. The girls who were randomly selected from these colleges formed the sample for the study. Teachers from different schools in the province formed the teachers' sample. The researcher also conducted interview schedules with 4 teachers.

3.1 Research site and Sampling procedure

The study was conducted in Nairobi Province. It targeted girls in various commercial colleges who had gone through the secondary examination. This enabled the researcher to understand those factors that influenced their performance in mathematics in secondary schools.

Post-secondary commercial colleges in Nairobi constitute the universe. With only the art based colleges offering training in secretarial, sales and marketing constituting the sample from where respondents were selected. Girls attending the sampled colleges were randomly selected. They self-administered the questionnaire under the supervision of the researcher.

Teachers teaching mathematics in different schools within Nairobi Province were sampled and interviewed as key informants where heads of mathematics departments were also co-opted into the study by responding to informal questions.

3.2 Research Instruments.

Most of the data were collected using a standard questionnaire (appendix 1). Some of the questions were closed ended while the rest were open ended to allow details by respondents and further probing. Additional data were obtained by interviewing key informants using interview schedule (appendix 2).

For the teachers and heads of departments oral interviews were more appropriate. Their views were written in a notebooks.

3.3 Data Collection and Analysis

The respondents were given about 45 minutes to respond to the questions and after which they were collected by the researcher. The researcher also administered some of the questionnaires and this took about 25 minutes.

The Data collected were analysed and results presented in form of frequency tables, to show girls and teachers responses to the various questions raised in questionnaires and orally.

In analysing data both qualitative and quantitative methods were used. Qualitative explanation was necessary for the researcher to be able to

interpret the inner feelings of the respondents. After analysing the data the researcher had evidence which assisted in establishing various factors in connection with the research problem. The findings and conclusions are presented thematically based on study objectives.

Chapter Four

Study findings

4.0 Introduction

This chapter deals with report of the data analysis and findings of the study in relation to the major research questions. A total of 63 questionnaires were administered to girls but only 46 of them are analysed as the other 17 were either incomplete or were never returned by the respondents. For the teachers and heads of departments oral interviews were carried out from 10 teachers and their views written in a note book.

4.1 Background information about the sample

The sample consisted of 46 girls who were randomly selected from 3 commercial colleges in Nairobi Province. 52.4% of these girls were born between 1973 and 1981.

32 (70%) of the girls' mothers were housewives/farmer while the 14 (30%) were working in different professions.

Of the sample collected 28 girls (60.9%) were represented as having had fees problems, which was also affecting the other siblings. 18 (39.1%) of these girls came from families where both the parents were farmers while 4 (8.7%) were from families where both the parents were in formal employment. 6 (13%) came from families where the mother was a housewife/farmer and the father in formal employment.

During their primary education 2 girls (4.3%) got an A, 18 (39.1%) had a B, 21(49.7%) had C, while 5 (10.9) had D. None of the girls had an E in Mathematics at the end of primary education. In their secondary education the primary performance in mathematics was not reflected because majority of the girls had a grade D who were 22 (47.8) girls, 11 (23.9%) girls had C, 8 (17.4) had E, 3 (6.5%) had fail 9 and 2 (4.3%) had credit 6.

Some of the factors that girls had sighted as having contributed to their drop in mathematics from their primary performance to their secondary performance was the negative attitude that they had towards the subject and less concentration in the subject, due to the mentality that the subject is hard.

16 (34.8%) of these girls were in provincial girls boarding schools. 8 (17.4%) were in District Girls boarding schools, 6 (13%) in private Girls boarding schools, 6(13%) in provincial girls boarding schools, 2 (4.3%) in harambe girls boarding school. One each of the remaining 8 (17.5%) were either in private girls boarding, private mixed day, mixed boarding, Harambee girls day, Harambe mixed day harambee mixed boarding, district mixed boarding National girls boarding.

Distribution of the mathematics teachers by sex is presented in table 4.2 below

Table 4.2: Categorization of Teachers by sex

Sex	Teachers	Percentage %
Females	3	30%
Males	7	70%
Total	10	100%

There were an unequal number of male and female teachers teaching mathematics in the selected sample. Close to $\frac{3}{4}$ (70%) of the sampled teachers were male while the remaining (30%) were females.

Distribution of mathematics teachers by overall teaching experience is presented in Table 4.3

Table 4.3: categorization of Teachers by overall teaching experience

Teaching duration	Teachers	Percentage %
Less than 3 years	1	10
3 – 5 years	2	20
5 – 10 years	3	30
Over 10 years	4	40

Mathematics had relatively young teachers in the profession where those who had less than 3 years was 10%. For 3 – 5 years cluster there were 2

that is an equivalent of 20%. For 5 – 10 years cluster were 3 (30%) and over 10 years were 4 (40%). It seems from this analysis that there was stability in the subject.

Distribution of teachers' views on how mathematics is performed in secondary schools is presented in 4.4. below.

Table 4.4: Teachers views on mathematics performance in secondary schools

Rating	No. of teachers	Percentage %
Very good	-	-
Good	2	20
Fair	2	20
Poor	5	50
Very poor	1	10
Any other	-	-
Total	10	100

Teachers were of various opinions on how mathematics is performed in secondary schools by girls. 2 (20%) teachers were of the opinion that the performance was good, 2 (20%) said it was fair, 5 (50%) said it was poorly performed while 1 teacher (10%) said it was very poor.

Distribution of teachers' views on whether girls have negative or positive attitude towards mathematics is presented in table 4.5 below

Table 4.5: Teachers views on girls' attitudes towards mathematics.

Teacher's comment	No. of teachers	Percentage %
Positive	3	30%
Negative	6	60%
Any other	1	10%
Total	10	100%

6 (60%) teachers were of the opinion that girls in secondary school had negative attitude towards mathematics. 3 (30%) were of the opinion that girls had positive attitude towards mathematics. 1 teacher (10%) had a mixed opinion on the same where she felt that not all girls have positive or negative attitude towards mathematics.

Distribution of teachers' views on the Readiness and willingness of the school's administration to help in mathematics in buying books is presented in table 4.6 below.

Table 4.6: teachers' views on school administration's readiness & willingness to help in mathematics.

Teacher's views	No. of teachers	Percentage %
Readiness to help	6	60
Not ready to help	3	30
Any other view	1	10
Total	10	100

This table indicates that most of the teachers 6 (60%) reported that the school administration was always willing to help and ready to buy mathematics books. 3 (30%) of them reported that the school administration was not ready or was unwilling to help.

Distribution of teachers' views on topics which girls find hard/difficult to tackle in mathematics is presented in table 4.7 below.

Table 4.7: Teachers views on topics that girls find difficult to tackle

Mathematics.

Topic	No. of teachers	Percentage %
Vectors	10	100
Three dimensions	8	80
Linear programming	8	80
Navigation	4	40
Bearing	2	20
Mixtures	2	20

All teachers 10(100%) reported that the most difficult topic for girls in mathematics was vectors. It was followed by three dimension together with linear programming which each had 8 (80%) of the teachers. Navigation was mentioned four times (4), which was 40%, while bearing and mixtures, were mentioned twice (20%) each.

Distribution of teacher's views on whether syllabus coverage or non-coverage influences girls' achievement in Mathematics is presented in table 4.8 below.

Table 4.8: Teachers' views on the influence of syllabus coverage in mathematics performance.

Teacher's views	No. of teachers	Percentage %
No	6	60
Yes	4	40%
Total	10	100%

6(60%) teachers in the mathematics department felt that syllabus coverage or non-coverage does not influence girls achievement in the subject.

Distribution of girls' view on how they rate their performance in mathematics is presented in table 4.10 below

Table 4.10: Girls views on how they rate their performance in mathematics.

Girl's views	No. of girls	Percentage %
Very good	5	10.9
Good	10	21.7
Fair	20	43.5
Poor	9	19.6
Very poor	2	4.3
Total	46	100

20 (43.5%) girls of the sampled population were of the view that their result performances in mathematics were fair. 10 girls (21.7%) said that their performance was good while 9 girls (19.6%) said it was poor and 2 girls (4.3%) said it was very poor.

Distribution of girls' view on whether they believe that mathematics subject is a prestige field meant only for the boys is presented in table 4.11 below.

Table 4.11: Girls' views on believe that mathematics subject is a prestigious field meant for boys only

Girls response	No. of girls	Percentage %
Yes	5	10.9
No	37	80.4
Any other comment/no response	4	8.9
Total	46	100

37 (80.4%) girls were of the view that mathematics is not a prestigious field meant only for the boys. To them mathematics can be pursued by anyone. 5 girls (10.9%) believe that mathematics is a prestige field meant only for the boys while 4 girls (8.9%) did not have any comment about this issue.

Distribution of girls' view on whether the teachers have helped them to improve in mathematics is presented in table 4.12 below.

Table 4.12: Girls' views on whether the teachers have helped them improve the subject.

Girl's views	No. of girls	Percentage %
Yes	25	54.3
No	17	37
Any other /no response	4	6.7
Total	46	100

25 (54.3%) girls were of the view that their teachers have helped them very much to improve in mathematics.

Distribution of girls' response on whether their parents have tried to help them improve in mathematics is presented in table 4.13 below

Table 4.13: Girls 'responses on the parents' help to improve the subject.

Girl's response	No. of girls	Percentage %
Yes	32	69.6
No	10	21.7
Any other/no response	4	8.7

32 (69.6%) girls responded positively to the question that their parents have tried to assist them very much to improve in mathematics. 10 of

them or 21.7% replied in the negative while 4 girls (8.7%) did not respond to the question. Parents are therefore aware of the great importance of mathematics and thus are greatly concerned to try and them improve in the same.

Distribution of girls' views on whether disciplinary problems might have affected their performance in mathematics is presented in table

4.14 below

Table 14: Girls views on the effect of disciplinary problems in their performance.

Girls views	No. of girls	Percentage %
Yes	4	8.7
No	42	91.3
Total	46	100

42 (91.3%) girls were of the view that disciplinary problems could not have affected their performance in mathematics. 4 of them (8.7%) were of the view that this could have influenced their performance in Mathematics.

1 Summary of the Findings

- a. It was noted that the number of female teachers in mathematics was few. This could affect girls' performance in the subject.
- b. Most teachers were of the view that mathematics was poorly performed in schools.
- c. Mathematics was again viewed negatively in the secondary schools where most girls had a negative view about it.
- d. Majority of the teachers reported that the school administration was willing and ready to help in buying of books and also assisting in staffing problems.
- e. Teachers reported that girls performed poorly in mathematics and this was largely due to girls negative attitude towards the subject.
- f. Most girls viewed their performance in the subject as fair.
- g. Most girls were also of the view that their performance in mathematics could improve if they put in more personal initiative and effort.
- h. To most of the girls, mathematics is not a prestigious field meant only for the boys.
- i. Teachers reported that the most difficult topics in mathematics and which in a big way affected girls' performance in the subject were vectors, three dimensions and linear programming.

Chapter 5

Discussion and Conclusion

5.0 Introduction

This chapter discusses the findings of the study and compares the results with other published findings. From the findings the researcher draws some conclusions and subsequently makes some recommendations at the end.

5.2 Conclusions

- On the basis of this study, a number of general conclusions can be arrived at.
- The number of female teachers teaching mathematics needs to be increased or equated to that of men in the secondary schools so that mathematics is not taken as difficult subject or meant only for men.
- 60% of the teachers felt that the girls had a negative attitude towards mathematics.
- Slightly more than half of the girls (54.3% were at the view that their teachers have helped them very much to improve in mathematics.
- Most of the girls 42 (91.3%) were at the view that the disciplinary problems could not have affected their performance in mathematics.

Recommendations

In view of the findings of this study and the general conclusions discussed above, the researcher thinks the following recommendations noteworthy.

1. There is need to invite more mathematics oriented and professional women to talk to girls in secondary schools and show them that mathematics is not tough and not only meant for men.
2. The school administration needs to have frequent meeting with subject teachers and girls to find out the problems faced by them with the view to solving them.
3. The school administration also needs to give the subject the first priority by getting good trained and committed teachers and also show the girls the importance of the subject.

5.4 Suggestions for further Research.

As only a few of the many factors affecting the effectiveness of teaching and learning of the subject were concerned, there is a need to research into the other factors that affect girls performances in mathematics:

1. research into how best to motivate learners for the effective learning and assimilation of mathematics concepts
2. research into areas, which make girls have poor background foundations in mathematics.

3. research into how the new technology in computers can effectively enhance the learning of mathematics in secondary schools.
4. investigate on how the most difficult topics in mathematics and which in a big way affected girls performance in the subject, can be simplified for effective learning.

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QUESTIONNAIRE

Put a tick on any choice that you select (when provided) in the questions below. Give information where required. All information given will be treated in confidence.

1. When were you born?
2. What are your parents/ occupations? (a) Mother.....(b) Father.....
3. How many siblings (Brothers/Sisters) do you have? Sisters.....Brothers.....
How many of them were school going siblings? Post secondary.....
Secondary..... Primary.....
4. Were you ever affected by fees problem? Yes.....No.....
If yes for the above, were the other siblings affected by the same?
Yes..... No.....
5. Which grade did you get in mathematics in you primary school?
A A- B+ B B- C+ C C- D+ D D- E
Others (specify)
- Which factors influenced your performance?
6. Which grade did you score in Mathematics in your secondary school?
A A- B+ B B- C+ C C- D+ D D- E
Others (Specify).....
Which factors would you say influenced your performance in this level?
.....
.....
7. Did your primary school education background affect your secondary performance? Yes..... No.....
If the answer to the above is yes, explain how.

8. What factors do you think were responsible for your improvement/decline in performance in your secondary school year's course?.....

.....

9. What was the gender of the teachers who taught you in mathematics in:-

Form 1 (a) Male.....(b) Female.....

Form 2 (a) Male.....(b) Female.....

Form 3 (a) Male.....(b) Female.....

Form 4 (a) Male.....(b) Female.....

If your answers in the above are the same gender, was it the same teacher?

Yes..... No.....

If yes for the above, how did this influence your performance?.....

.....

10. Did your teachers try to help you improve in the subject? Yes..... No.....

If yes for the above, explain.

.....

11. What was the ratio of the female mathematic teachers did you have in relation to male teachers in your school?

.....

How did this influence your performance?

.....

12. Were you attending lessons and classes regularly?

Have you ever had disciplinary problems which might have affected your learning process? Yes..... No.....

If yes for the above explain

.....

13. How do you think the fact that more men than women in Kenya occupy mathematics related careers/positions such as engineering and accountancy influenced your performance in mathematics?

.....
.....

14. Do you think your gender affected your performance in mathematics?
Yes..... No.....

If your answer for the above is yes, explain.

.....

15. What personal initiative did you as a student take to improve in the subject?

.....
.....

16. Do you personally believe that mathematics subject is a prestigious field meant only for boys?

.....
.....

Give reasons for your answer.

.....

17. What do you think about the notion that the girls/women's career are domestic based?

.....
.....

18. How did your parents or the community around you influence your performance in mathematics?

.....
.....

19. What do you think about the general stereotype that girls do not have to perform well in mathematics and science in general in relation to your performance?

.....
.....

20. What was the type of your school?

- a) Private Secondary School
- b) Harambee secondary school
- c) District secondary school
- d) Provincial secondary school
- e) National secondary school

Which category was it?

- a) Girls boarding
- b) Girls day
- c) Mixed boarding
- d) Mixed day

Did this have any influence in your performance? Yes No

If yes explain how.

.....
.....

21. How did the school administration influence your performance?

.....

22. Can you suggest possible ways of improving mathematics performance in secondary schools?

.....
.....

23. In your opinion do you think there is anything else that needs to be done to help girls improve performance in mathematics and science subject in general?

.....
.....

24. What role should the school administration play in improving mathematics performance?

.....
.....

25. What was your mean grade score in the Kenya Certificate of Secondary examination?

A A- B+ B B- C+ C C- D+ D D- E

Others (specify).....

APENDEX 2 – Interview guide for teachers

1. Background information

- Sex of the teacher
- Number of years of service

2. How would you rate the performance in mathematics by girl child in Secondary School?

3. What in your opinion has contributed to this poor performance?

4. What kind of attitude do girls in secondary schools have towards mathematics?

5. What topics in your opinion, do girls find difficult in mathematics?

6. Does the syllabus coverage or non-coverage influence the girls performance in mathematics?

7. Do you have administrative problems, which might affect the good performance of mathematics in secondary schools?

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