

**FACTORS AFFECTING STUDENTS' PERFORMANCE IN
MATHEMATICS AT K.C.S.E LEVEL IN SELECTED MIXED
SECONDARY SCHOOLS IN NJIRU SUBCOUNTY; NAIROBI**

BY

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Learning in Partial Fulfillment for the Award of Post Graduate
Diploma in Education University of Nairobi.**

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DECLARATION

This project is my original work and has not been presented for award of Diploma or Degree in this or any other University.

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This project has been submitted with my approval as University supervisor.

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DEDICATION

This research project is dedicated to my brother George Oyugi, and my father Dickson Oguma whose tireless effort and determination motivated me to undertake this research.

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I would like to take this opportunity to appreciate my supervisor Mrs. Janet Obiero for intellectual support, encouragement and tirelessly guiding me through the vigor of the research. I also recognize and acknowledge the Lecturers from School of Continuing and distance Education of the University of Nairobi who equipped me with knowledge on how to do a research. Finally, I wish to express my gratitude to my fellow teachers at Kinyago School for their continued support in my studies and for encouraging me toward this project.

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ABBREVIATIONS AND ACRONYMS

KCSE :Kenya Certificate of Secondary Education

KIE: Kenya Institute of Education

KNEC: Kenya National Examination Council

MoE: Ministry of Education

PGDE :Post Graduate Diploma in Education

SPSS :Statistical Package for Social Sciences

ABSTRACT

Mathematics has been lauded as a subject that is crucial not only to everyday life processes like budgeting but also in career development. However, studies have shown that the performance of mathematics has over the years continued to be poor globally. There has been a concern over mathematics performance among understudies in blended auxiliary schools in Njiru sub-region .The motivation behind this investigation was to research the variables affecting execution of arithmetic in Kenya Certificate of Secondary Education examination in chose blended optional schools in Njiru sub-province. The targets of this examination were: To decide how the instructor preparing impacts the execution of Mathematics in blended auxiliary schools in Njiru Sub-County, to investigate how understudies state of mind impacts the execution of Mathematics in blended optional schools in Njiru Sub-County and to look at how the accessibility of assets impacts the execution of Mathematics in blended auxiliary schools in Njiru Sub-County. The examination received the unmistakable overview (cross-segment) investigate structure. The objective populace was 1860 respondents that included 60 instructors and 1800 understudies. Three schools from the 40 blended optional schools were picked through basic irregular testing. 6 Teachers and 313 understudies were purposively chosen from the three chose schools while the polls, meeting and individual perceptions were utilized as instruments of gathering information. Information was broke down utilizing Microsoft Excel and Statistical Package for Social Science (SPSS) and presented in form of simple tables, figures and percentages where appropriate. Qualitative data was analyzed using descriptive narratives. The study revealed that availability of resources; student attitude and teacher training have a significant relationship with performance of Mathematics. The study recommends that attitudes be worked on at an early stage and that teachers should undergo continued professional development. It further recommends that the educational stakeholders should avail enough and quality teaching resources. This research will be beneficial to the Ministry of Education, head of schools and other stakeholders.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Mathematics performance is a concern for education stakeholders all over the world. The performance of 3765 students at the age of 15 in 158 schools, for the Programme for International Student Assessment (PISA) in Turkey revealed that students' affective measures, home-family background characteristics and what teachers do in the classroom affect achievement in mathematics Demir, Kılıç and Depren (2009). In the United States of America, most 4th and 8th grades children performed below average as compared to their peers around the world, The American Institute of Research (2007). The performance was attributed to teacher characteristics. The performance of Mathematics in Africa has also been noted to be dismal. Nigeria, for instance, has continuously recorded poor mathematics performance in the West African School Certificate Examination. This has become a concern for education stakeholders in the country, as student's outcomes did not match parental and government investment schools and tertiary institutions, (Kola (2014). In Kenya, mathematics performance has not been good and stakeholders have not found the real cause more so in mixed secondary schools. In a disturbing trend , nearly 90% of students who took their exams in 2016 scored between C- and E in mathematics, a 10% increase from previous years as contrasted to the 4% who achieved between A and A- in the same subject, ((*Daily Nation*, 20th October 2017). Secondary Schools in Nairobi have also been suffering from poor performance in Mathematics. Ndinda, (2016) cites that despite the introduction of the SMASSE project, Strengthening Mathematics and Sciences in Secondary Schools by the Government of Kenya in 1998, mathematics performance has remained to be low in Nairobi County. The study reveals that Mathematics grades in the Kenya Certificate of Secondary Education ranged from 3-4 from 2006-2009. In Njiru Sub County, mathematics performance has also been poor over the years. This perennial dismal performance in the subject has raised a lot of concern in the country and has led to several studies to examine the cause of the downward trend. It is against this foundation that this investigation will be directed to decide the impact of demeanor, accessibility of assets and instructor preparing on the execution of Mathematics in the Kenya Certificate of Secondary Education examination.

1.2 Statement of the Problem

Poor performance in mathematics in Njiru Sub-County has been a matter of concern to education policy makers, teachers, parents and students. This is partly to be blamed on the poor attitude of students towards the subject. Attitude, being the psychological perception towards something or someone, in this case mathematics, exerts great influence on how a student will perform. Attitude affect the activities undertaken by students during teaching and learning process which in turn affect the performance .This is in line with the findings of Tudor, Penlington & McDowell (2010) and Ellis et al. (2008). In addition to this, teacher beliefs concerning Mathematics have a great effect on their choice of instructional method which in turn influences their student interest and achievement, this is according to Nicolaidou & Philippou (2003). When teachers are poorly trained and lack experience, they cannot deliver the content well during teaching hence results in poor performance in the examination by the students, this is in line with the findings of Zhang (2008), who reiterated that Science teachers with high level degrees in science positively influenced student performance in science subjects. Inadequate or total lack of resources such as textbooks, furniture, calculators and teachers has greatly affected the performance of mathematics in secondary schools. Inadequate resources make it difficult for students to study on their own and sometimes waste time waiting for others to finish using them. The nature of instructive assets is measurably noteworthy on understudies' math education. Other than sexual orientation and list of monetary, social and social status, human and material assets impact understudies' math proficiency accomplishments and that the nature of school instructive assets ought to have a need among material assets, this is as indicated by Aztekin and Yilmaz (2014). It is against this foundation that this examination will decide how accessibility of assets, states of mind towards arithmetic and instructor preparing impact Mathematics execution in the Kenya Certificate of Secondary Education.

1.3 Purpose of the study

The purpose of the study is to investigate the factors influencing the performance of Mathematics in Secondary Schools in Njiru Sub- County.

1.4 Specific Objectives of the study

This study was guided by the following objectives:

- i) To determine how the teacher training influences the performance of mathematics in selected mixed Secondary Schools in Njiru Sub-County.
- ii) To investigate how students attitude influence the performance of mathematics in selected mixed Secondary Schools in Njiru Sub-County.
- iii) To look at how the accessibility of instructing and learning assets impacts the performance of Mathematics in selected mixed Secondary Schools in Njiru Sub-County.

1.5 Research Questions

This research was guided by the following questions:

- i) How does teacher training influence the Mathematics performance in selected mixed Secondary Schools in Njiru Sub-County?
- ii) How do attitude influence the performance of Mathematics in selected mixed Secondary Schools in Njiru Sub-County?
- iii) How does the accessibility of educating and learning assets influence performance of Mathematics in selected mixed Secondary Schools in Njiru Sub-County?

1.6 Significance of the Study

This investigation will benefit mathematics teachers in Secondary Schools in Njiru Sub-County. It is the earnest wish of the scientist that they will take the discoveries, conclusion and suggestions of this investigation and use them to come up with strategies to raise mathematics performance in their respective schools. It will also form the basis of further studies on the performance of Mathematics in schools. This research will assist the Ministry of Education, Kenya National Examinations Council and Kenya Institute of Curriculum Development as it will enable them to have reliable information on how teacher training, students perception, and availability of teaching and learning resources influences the performance of mathematics in Kenyan schools. This will in turn enable them to develop learning materials that will address the issues that the researcher has highlighted to enhance mathematics grades in Kenyan secondary schools.

1.7 Limitations of the study

The accompanying impediments were experienced amid the investigation. Initially, not every one of the respondents was certain in their reaction because of dread that the data they give would be utilized for wrong purposes. The specialist took care of this by demonstrating a starting letter from the University to guarantee them that the data given would be confidential and would be used purely for academic purposes. There were limited resources for reference so alternative reference sources had to be utilized. The study utilized those that were readily available and also used secondary data, lastly, the focus of the study was on three mixed secondary schools only within Njiru- sub-county; this limits the ability of the researcher to generalize the findings to a large population.

1.8 Delimitations of the Study

The study was limited in a number of ways. It was restricted to mixed secondary schools in Njiru Sub- County. The researcher focused on three objectives only; influence of availability of resources, student attitude and teacher training on the performance of Mathematics in K.C.S.E. Mathematics teachers and students in three mixed secondary schools acted as respondents. The study utilized both questionnaire and interview to get more comprehensive data

1.9 Assumptions of the Study

This study was carried out under two assumptions; that all the respondents would be positive and truthful in their response, and that the sample would be representative of the whole population of study.

1.10 Operational definition of terms

The following terms have been defined as used in the study:

Performance of mathematics: this refers to achievement in the Kenya Certificate of Secondary Education

Academic performance: this is defined in the study as scores obtained by students in examination.

Examination: a written assessment used to verify the extent of students' knowledge and understanding of mathematical concepts.

Attitude: This denotes the outlook and beliefs of learners concerning Mathematics

Professional qualification: Denotes any teaching related training and professional development the teacher has undergone in the course of his/her employment period

Secondary school: This refers to Form 1 to Form 4 classes

Kenya National Examination Council: The Kenyan body responsible for the setting and administration of national examinations.

Kenya Certificate of Secondary Education: Refers to the final examination that secondary school students undertake before completing secondary school.

1.11 Organization of the Study

Chapter One of the examination covers the foundation to the exploration, explanation of the issue, Purpose of the investigation, destinations, and look into inquiries, noteworthiness of the examination, extension, confinements and delimitations, suspicions and meaning of terms. Chapter Two spotlights on writing survey where past investigations important to the examination goals are talked about, Chapter talks about the examination procedure utilized, to guarantee that right and dependable information is gathered. Section centers around the discoveries of the investigation and incorporates information examination, introduction and understanding. Finally, section five presents synopsis ends and proposals

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter focuses on review of relevant literature about factors that influence the performance of mathematics in K.C.S.E as pertains to the three factors mentioned in the objectives section in chapter One. It gives overview of past work on related themes that give the important foundation to the motivation behind this examination. The study focuses on availability of resources, student attitude, and teacher training and how other researches have attempted to explain their influence on the performance of mathematics.

2.2 Performance of Mathematics

Ker (2013) conducted a global comparative analysis on mathematics performance using Trends in International Mathematics and Science Study (TIMSS) data for the year 2011. He noted that the performance in Chinese Taipei, USA and Singapore was not the same, but that the mathematics achievements of students in the three countries showed improvement over time. Sosnowski, (2014) adds that cognitive capability, personal motivation, social attitudes and math anxiety are some of the determinants of a student's ability to perform in Mathematics. It is therefore crucial for each institution to verify the factors that most affect its students and work towards alleviating them in a bid to increase performance in mathematics.

2.3 Causes of Poor Performance in Mathematics

The factors that affect the performance of Mathematics have for a long time been an area of interest for teachers, parents, education policy makers and researchers. This is mainly because in spite of numerous studies, there has been continued underperformance in the subject. There are a number of factors that have been identified as influencing the performance of Mathematics. Wekesa (2013) points out that instructional methods, funding of educational facilities, student teacher ratio, teacher's length of teaching, attitudes and teachers' academic and professional training are causes of poor performance in mathematics. Banerjee, (2016) adds that poor attitude towards school and learning, neighborhood effects, domestic factors, less supportive teachers, perceived discrimination and school contextual factors also greatly affect students thus leading to poor performance in Mathematics, Kola et al, (2014) in their study also reiterate that mass failure of students

in public examinations can be attributed to multidimensional factors that include parents, students, teachers, schools, government and the society among others. As revealed by the studies mentioned above, the factors that affect the performance of Mathematics are numerous. The researcher however concentrated on three factors; availability of resources, student attitude and teacher training & experience.

2.4 Teacher Training

There have been many researches undertaken to ascertain the influence of teacher education on academic performance. Zhang, (2008) however, notes that there have been conflicting conclusions on the effect of teacher training on student achievement, with some researchers concluding that there is a positive relationship, while others cite no relationship at all.

Harris and Sass (2008) in their study titled *Instructor Training, Teacher Quality and Student Achievement* inspected the impacts of different sorts of educator training and preparing on understudy accomplishment. The investigation used understudy level accomplishment test information for both math and perusing for Grades 3-10 for the years 1999-2000 through 2004-2005 in the territory of Florida. It concentrated on the connection between educator preparing and profitability by estimating the impact of pre-benefit and in-benefit preparing on understudy execution. Their outcomes on the impact of expert improvement on performance were weak and inconsistent as they revealed that teachers tended to undertake professional development only as a re-certification requirement. In terms of having an advanced degree during their career the study revealed that it has a positive effect on performance only in middle class math, while for elementary and high school there was no effect and negative effect respectively. This study is limited in that it utilized secondary data which may have given results relevant to only that specific time. However, performance is a fluid factor and may keep on changing. In contrast, the current study will utilize primary data obtained through questionnaires, interviews and personal observations to draw more comprehensive conclusions.

Farooq& Shahzadi (2006) in their study entitled *Effect of Teachers' Professional Education on Students' Achievement in Mathematics* compared the effectiveness of teaching of professionally trained and untrained teachers for four hundred secondary school

graduates. They used the descriptive survey research design convenient sampling technique. The mathematics scores of the selected secondary school students were obtained from their respective schools and studied. In comparing the mean scores of students taught by trained and untrained teachers, the study revealed that there is a significant difference in the performance of students taught by the two categories of teachers in that the mean score of students taught by trained teachers tended to be higher than those of students taught by untrained teachers. They thus concluded that trained teachers have a more positive effect on the performance of students as opposed to untrained teachers. This study focused only on trained and untrained teachers as a whole but failed to put into consideration factors such as on the job training which can be used to develop skills even without having prior teaching knowledge. The current study however endeavored to show that teachers without prior education training can still get on the job training and achieve high academic scores for the students.

2.5 Student Attitudes

Ellis et al., (2008) stated that the activities that students undertake that result in learning can be affected by pre-existing beliefs concerning the course requirements, teacher expectations or the student's ability to excel in the course,

Mutodi & Ngirande, (2014) carried out a study titled *The Influence of Students' Perceptions on Mathematics Performance: A Case of a Selected High School in South Africa*. The specialist utilized a quantitative research approach. The example populace comprised of 150 young men and young ladies in review 10 from a chose secondary school in Limpopo region of South Africa. 124 respondents were chosen utilizing basic irregular inspecting. Discoveries of the investigation demonstrated that in South Africa, science is seen as hard to the degree that most understudies decide not to seek after arithmetic after mandatory training. Understudies apparent the subject to be hard in light of the fact that composition numbers and recipe applications are determinants of their execution in the subject. The outcomes further uncovered that understudies' convictions about what arithmetic is or isn't affects their execution. Along these lines understudies who for the most part trusted that science is troublesome would in general perform ineffectively in the subject. The investigation presumed that understudies who battle with science see that the substance is

so overpowering making it hard to assimilate and that arithmetic is difficult. The above study utilized only one high school which may have restricted the results in terms of accuracy. This study will however select students from three schools to give a more accurate view on the effect of attitude on mathematics performance.

Enu ,Agyman & Nkum (2015) in their study titled *Factors affecting students' Mathematics Performance in some Selected Colleges in Ghana* also assessed the impact of attitude on performance .The population of study consisted of all education colleges in Central and Western region of Ghana with 50 students being randomly selected from 3 colleges in the region. The study adopted the survey research design with descriptive studies being used for data analysis. Students were asked of their opinions towards learning and performance of mathematics. 66% of the respondents intimated that they strongly disagreed that they strain during mathematics lessons while 48% indicated that they felt at ease with mathematics. A further 70% agreed that mathematics is useful in life processes. In response to whether they felt a positive reaction towards mathematics, 50% responded that they do enjoy studying mathematics. Only 6% of the respondents strongly agreed that mathematics made them feel uneasy, insecure and impatient, with a further 8% reiterating that they dread mathematics and have never liked it. The study concluded that students do have a positive outlook towards mathematics and that their attitude towards mathematics influences the effort they put towards learning the subject. This study neglected to mention the effect of peers, prior performance and teacher expectations of the ability of a student to perform on student attitude towards mathematics. This study however focused on the three to determine their influence on attitude.

2.6 Availability of Teaching and Learning Resources

The performance of students in any subject is greatly influenced by the availability of resources. Availability of teaching and learning resources is crucial to the continuance and effectiveness of the education process. Teaching and learning resources are mostly categorized into three; adequate physical facilities, teachers and material resources (textbooks and supplementary learning materials). Akungu (2014) in her investigation, *Influence of Teaching and Learning Resources on Students' Performance in Kenya Certificate of Secondary Education in Free Day Secondary Education in Embakasi District,*

Kenya assesses the impact of availability of TLR on learning mathematics. The descriptive study design was used for the research, while data analysis was carried out using descriptive statistics. The target population consisted of all the free day secondary schools in the district, their head teachers, teachers and students from which 6 principals, 18 teachers and 240 students were selected as the sample population. The findings stated that 66.6% of the head teachers thought that their schools had adequate reference books and teachers' guides. Teachers in the same school disagreed with their head teachers, giving neutral responses on the same questions. On the matter of teaching resources specifically calculators, findings showed that 33.3% disagreed with the notion that there were enough calculators, while 38.9% were neutral. This study is limited in that it focused only on day secondary schools as opposed to the current study that will include both day and boarding schools.

Mbugua (2011) in his investigation entitled *Adequacy and The Extent to which Teaching and Learning Resources for Mathematics are accessible and utilized for Achievement in the Subject in Secondary School in Kenya* likewise referred to those assets are essential for enhanced science execution to be accomplished. The examination received the ex post facto inquire about structure and information analyzed using descriptive statistics. 71 mathematics teachers and 661 form three students were the respondents of the study. Findings revealed that 81.7% of the schools had over 40 students per class leading to stretching of the available resources and overcrowding which was not conducive to learning. All the classes in the study had chalkboards though 70% were poorly maintained, worn out or faded. In terms of textbooks, 9.9% of schools had an adequate number of form one mathematics textbooks, 11.3% for form two and 15.5% for form three, indicating a critical shortage of textbooks in schools. The study concluded that there were inadequate mathematics teaching and learning resources in schools

2.7 Theoretical Framework

This study will be based on the systems theory Bertalanffy, (1968). This theory views mathematics as a system with goals and objectives that should be achieved following the learning process. Wachira, (2016) in quoting Gamble, (1984) posits that the theory denotes a system of interrelated instructional processes that work cohesively to assist the learners

to achieve desired goals. These processes comprise internal and external environment/conditions. According to Gagner and Briggs, (1979), an effective and efficient learning process is not guaranteed outside the internal and external conditions of a learner. The internal conditions of a learner can be referred to as his /her physiological readiness, which are the pre-condition for learning to take place and pre-existing beliefs and pre-conditions about a subject. The external conditions can be viewed as availability of resources, teacher training and experience and teacher attitudes. The systems theory therefore asserts that the learning environment, whether internal or external affects learner achievement. The systems theory is applicable to the school setting since a school has several departments all working interdependently towards achieving institutional goals, with the most important being good academic performance. In relation to this study, students who have achieved the required grade are admitted to form one, with the aim of instructing. The goal of this instruction is that the students will grasp mathematical concepts. The instruction process is administered through a series of lessons, symposiums, remedial, guidance and counseling by teachers and other staff. The aim is to ensure that the student is pre-conditioned in such a way that he /she is able to achieve high grades, that the resources available are utilized adequately in promoting student success and that the teachers utilize their skills in ensuring high performance. All these systems work interdependently to ensure two outcomes; high academic score for the students, and a good reputation for the school.

2.8 Conceptual Framework

The conceptual framework illustrates the causal relationships between the independent variables and the dependent variable. Figure 1 below shows the relationship between the independent and dependent variables which student attitudes, availability of teaching and learning resources and teacher training and the dependent variable which is performance of Mathematics. It also shows the indicators for the independent variables. The figure also includes moderating variables which are factors that have a direct or indirect impact on mathematics performance

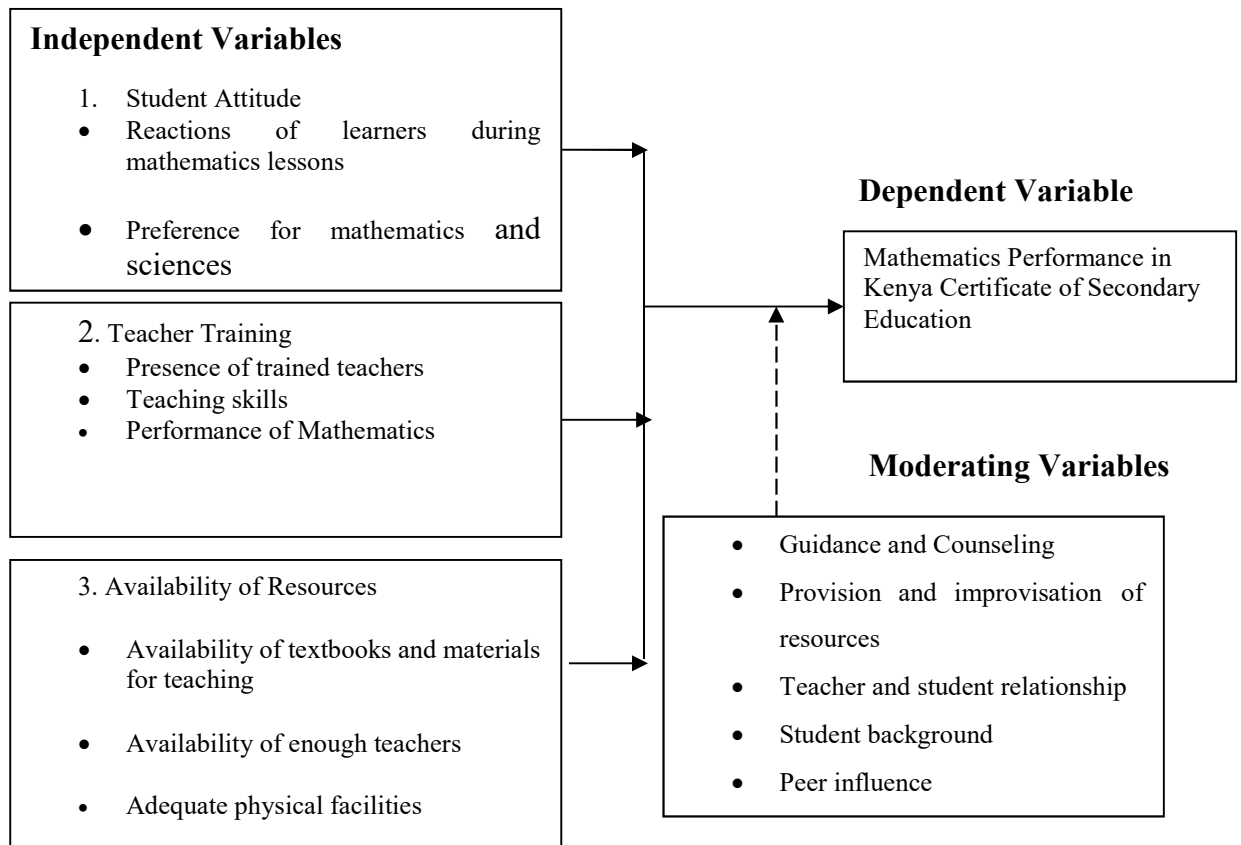


Figure 2.1: Conceptual Framework (Source, Field Study 2018)

2.9 Summary

The reviewed literature revealed various studies in different parts of the world that have attempted to find out how availability of resources, student attitude, and teacher training influence the performance of mathematics. The literature however reveals that researchers have not always fully agreed on whether the factors affect performance negatively, positively or do not have any effect at all. This area of study requires further research especially in the Kenyan context.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter gives point by point inquire about methodologies. It likewise introduces the exploration techniques and methodology associated with accomplishing the set targets of the examination. The examination configuration is clarified and delineated. The objective populace and the investigation region are portrayed and additionally, test size and examining techniques. Information gathering techniques, information accumulation instruments, and strategies for information investigation are additionally included.

3.2 Research Design

The researcher utilized the descriptive survey design (cross section technique). This method was used as it illustrates the cause-effect relationship between the independent and dependent variables. The study also adopted this method because of time and resource constraints. The insights from the study were applied to other secondary schools within Njiru Sub-county. Kumar, (2005) notes that a descriptive survey enables one to draw conclusions from the revealed facts. It also reduces error in the analysis of data collected.

3.3 Target Population

Target population alludes to the whole gathering of individuals, occasions, or things of intrigue that the analyst wishes to think about. The objective populace in this examination was 1860 respondents that comprised of 60 teachers and 1800 form four students in mixed secondary schools in Njiru sub-county.

3.4 Sample Size

Sampling is the way toward choosing units from a characterized populace of enthusiasm as illustrative of that populace. It guarantees that ends from the investigation can be summed up to the whole populace. Test measure is the part of the populace to be examined with the end goal to make a deduction to a more extensive populace to which the discoveries from an investigation are to be summed up (Araoye 2004). Where an analyst determines the accuracy that he needs in regard of his assessments concerning the populace parameters, e.g. certainty level, similar to the case in this investigation, Kothari (2004) gives the underneath expressed recipe to be utilized for figuring a testing size.

$$n = \frac{z^2 \cdot N \cdot \hat{p}^2}{(N - 1)e^2 + z^2 \hat{p}^2}$$

Where;

n = Size of the example,

N = Size of the populace,

e = Acceptable blunder (the accuracy) and given as 0.05,

\hat{p} = the standard deviation of the populace and given as 0.5 where not known,

Z = Standard variate at a certainty level given as 1.96 at 95% certainty level.

The example estimate for this examination was acquired utilizing the above formulae, by utilizing the objective populace of 1860 with a 95% certainty level and a mistake of 0.05.

$$n = \frac{1.96^2 \cdot 1860 \cdot 0.5^2}{(1860 - 1)0.05^2 + 1.96^2 \cdot 0.5^2}$$

$$\frac{1786.344}{5.6079}$$

$$n=319$$

Table 3. 1 Sample Size

Category	Frequency	Percentage (%)	Procedure	Sample Size
Teachers	60	10 %	0.1*60	6
Students	1800	17.4%	0.174*1800	313
Total	1860			319

Table source :computed by author 2018

A sample size of 10% -15% is enough for a survey according to Mugenda and Mugenda (2003) . Ary & Razarieth (1972) also cite that the least sample size for a survey of a small population is 20% and that of a large population is 10%. As such, a sample of 3 deputy principals, 3 mathematics teachers and 313 form four students was selected through simple random sampling design. This accounts for 17.2% of the target population.

3.5 Instrumentation

The essential information required for the investigation was gathered utilizing an organized survey. The survey was by and by regulated to chosen respondents in the schools that shape the example populace. The survey involved both open-ended and close-ended inquiries. The questions sought information in areas such as the educational background of the participants, expertise of the teachers, TLR resources available in the school, and attitudes of the students towards mathematics as a subject. Respondents were asked to tick the option they deemed best. The researcher also used interviews with mathematics teachers in the sub-county.

3.5.1 Pilot Testing of the Instrument

A questionnaire was drafted and reviewed by the research supervisor and colleagues, and then their comment was incorporated in drafting the final one. The final draft was at that point tried on a little pilot test of respondents with comparable attributes as the investigation respondents. The guiding included twenty understudies and two instructors. Mugenda (2003) recommend that the steering test ought to speak to 10% of study test therefore a sample of 20 form four students and two mathematics teachers was purposively selected outside the included sample this represent 10% of the study The piloting was used to help identify vague question and improvement was made to the final draft of the questionnaire.

3.5.2 Validity of the Instrument

Validity of the instrument is how truthful the research results are, it decides if the examination instrument genuinely measures what it was expected to quantify (Joppe, 2000).

It very well may be dictated by utilizing a board of people who will pass judgment on how well the estimating instrument meets the norms (Kothari, 2004). Content legitimacy alludes to how much the substance of the things mirrors the substance space of intrigue (Miller, 2003) Content legitimacy was given by the enough inclusion of the theme under investigation The instruments were looked into by the exploration manager to pass judgment on whether the instruments covers what it should cover. A pilot ponder was

utilized to gauge the legitimacy by affirming that all respondents comprehended the things on the survey to abstain from misconception. Reaction choices was given to the majority of the inquiries to guarantee that the appropriate responses given are in accordance with the examination addresses they are intended to quantify.

3.5.3 Reliability of the Instruments

Reliability is how much a specific estimating technique gives comparative Results over various rehashed preliminaries (Orodho, 2003). The endorsed general convection in research expresses that a dependability coefficient (alpha) Of 0.7 or more is considered acceptable reliability (Nunnally et al, 1994). The Cronbach alpha method was used to test for the reliability by conducting pilot tests and the data collected from the tests were analyzed using SPSS. The reliability coefficient (alpha) of 0.85 was obtained showing that the instruments used were reliable

3.6 Data Collection and Analysis Procedure

After seeking permission from the principal, the researcher picked the deputy principal who helped in randomly selecting the students, questionnaires were given to all the respondents and the interview done and the instruments collected back. Once the responses were received, the questionnaires were edited for completeness, accuracy, uniformity and consistency before processing, Data was then then fed into the computer for analysis using a spreadsheet (Microsoft Excel) and Statistical Package for the Social Sciences (SPSS) the study utilized both qualitative and quantitative data collection techniques. The data was collected through a questionnaire that contained both open ended and structured questions. The data collected on the responses was analyzed qualitatively and quantitatively. And presented in percentages using simple tables and figures where appropriate.

3.7 Ethical Considerations

This study was guided by adherence to research ethics. The identities of the respondents were kept confidential. The researcher exercised utmost honesty and in so doing arrived at conclusions based only on the data collected. The aim of the study was explained to the respondents to assure them that it was for academic/research purposes only. The researcher also ensured that any work which was written was original

3.8 Operationalization of Variables

Table3. 2: Operationalization of Variables

Research Objective	Dependent Variable	Indicators	Type of data analysis
To examine how the availability of resources influences the execution of Mathematics in Secondary Schools in Njiru Sub-County.	Performance of Mathematics in K.C.S.E	Availability of textbooks and materials for teaching Availability of enough teachers Adequate physical facilities	Descriptive
To explore how attitude influences the execution of Mathematics in Secondary Schools in Njiru Sub-County	Performance of Mathematics in K.C.S.E	Reactions of learners during mathematics lessons Preference for mathematics and sciences	Descriptive
To determine how the instructor preparing influences the execution of Mathematics in Secondary Schools in Njiru Sub- County.	Performance of Mathematics in K.C.S.E	Presence of trained teachers Teaching skills Performance of Mathematics	Descriptive

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter present the investigation and understanding of the information as set out in the examination structure. The three targets that tried to be tended to were: to decide how the educator preparing impacts the execution of Mathematics in blended Secondary Schools in Njiru Sub-County, to investigate how understudy states of mind impact the execution of Mathematics in blended Secondary Schools in Njiru Sub-County and to look at how the accessibility of instructing and learning assets impacts the execution of Mathematics in blended Secondary Schools in Njiru Sub-County. The information was introduced utilizing pie graphs, tables and rates, since the idea of the investigation was engaging.

4.2 Questionnaire Response Rate
The table below shows the response rate.

Table 4.1 Questionnaire Response Rate

respondents	Sample size	Actual response	Percentage (%)
Students	313	189	60.4
Mathematics teachers	3	3	100
Deputy-Principals	3	3	100

(Source, Field Study 2018)

The sample population of the study comprised of 3 deputy principals, 3 mathematics teachers and 313 form four students. The questionnaire was administered to all the three mathematics teachers and they all responded. This represented 100% return rate of mathematics teachers. All the three deputy principals each from the three selected schools were also issued with questionnaires and they all returned representing 100% return rate for deputy principals. Among the three hundreds and thirteen students given the questionnaires, one hundred and eighty nine responded. This represented their return rate of 60.4 %. Mugenda & Mugenda (2003) cite that a 50 % return rate is adequate for data analysis. In view of this, the response rate for this study was found to be adequate to make accurate conclusions as pertaining to the objectives under study.

4.3 Demographic Information of Respondents

Demographic information refers to the specific characteristics of a population. Salkind, (2010) cites that examples of demographic characteristics include gender, race, age, ethnicity, income, education, home ownership, family size and marital status.

4.3.1 Demographic Data of the Teachers

Gender distribution of the deputy principals and mathematics teachers was sought and data presented in the table below:

Table 4.2 Distribution of Teachers and Head teachers by Gender

Gender	Deputy-Head teachers		Teachers	
	Frequency	Percentage	Frequency	Percentage
Male	2	66.7	2	66.7
Female	1	33.3	1	33.3
Total	3	100.0	3	100.0

(Source, Field Study 2018)

From Table 4.2, majority of the Deputy-head teachers (66.7%) were male while female form 33.3% of the Deputy-head teachers in the sub-County. This indicates there is a great disparity in the distribution of male and female Deputy-head teachers in the sub-County. In addition, the study established that majority of teachers (66.7%) were male while the female teachers formed the minority at (33.3%). This could be attributed to the fact that mathematic was originally deemed as a hard subject and many females don't pursue it in their college education. The difference in the Deputy Head teachers could be because there were more responsive male administrators and more boys in the schools in the sub county. Teacher teaching experience was another area that the study sought to address. The findings are outlined in the table below:

Table 4.3 Distribution of Teacher Experience

Years of Experience	Frequency	Percentage
Below 5 years	2	33.3%
5-10 years	2	33.3%
11-15years	1	16.7%
16-20 years	1	16.7%
21-25 years	0	0.0%
above 25 years	0	0.0%

(Source, Field Study 2018)

The results show that 4 of the teachers had teaching experience of more than five years, with 2 (33.3%) having under 5 years' experience. Experience is crucial as teachers who have taught for a longer time are well versed with different teaching techniques, have interacted with different kinds of students and are thus able to deal with different attitudes that contribute towards performance. The study reveals that even though a majority of the teachers have more than five years' experience, performance still remains poor.

4.3.2 Demographic Data of Students

The demographic data for the students focused on their gender, age, parent occupation, parent level of education, and academic performance.

Table 4.4 Student Age Distribution

Age	Frequency	Percentage
15-18	167	88.4 %
Above 18	22	11.6 %
Total	189	100%

(Source, Field Study 2018)

The data revealed that majority of the students (88.4 %) were in the 15-18 age bracket as opposed to 11.6 % who were above 18.

Students were also requested to indicate their gender.

Table 4.5 Student's Gender Distribution

Gender	Frequency	Percentage
Male	103	54.5%
Female	86	45.5%
Total	189	100%

(Source, Field Study 2018)

As illustrated in the table above, 45.5 % of the respondents were female while 54.5 % were male. It was thus revealed that male students account for a larger percentage of students in Njiru Sub-county.

The researcher also sought to establish the education level of the parents, the findings of which are given in the table below:

Table 4.6 Distribution of Parents Education

Level Of Education	Frequency	Percentage
Primary	52	27.5 %
Secondary	116	61.4 %
Tertiary	21	11.1 %
TOTAL	189	100 %

(Source, Field Study 2018)

According to the findings a majority of the parents had at least secondary education at 61.4%, 27.5% reached primary school while 11.1% had tertiary level education. The level of parent education is important because parents are responsible for attitude formation in their children from a very young age. Their perceptions on education greatly influence the performance of a child from a young age and even in latter stages of life.

In terms of the occupation of the parents, the following responses were given by the respondents:

Table 4.7 Distribution of Parent Occupation

Occupation	Frequency	Percentage
Professional	25	13.2 %
Casual	36	19.0 %
Self- employed	80	42.3 %
Unemployed	48	25.5 %

(Source, Field Study 2018)

The results above reveal that a large percentage of the parent population was either unemployed (25.5%) or self-employed (42.3%). Ngare, Maronga, Tikoko & Sigei (2016)

reiterate that when parents are involved in manual low paying jobs, it limits their ability to participate in the education of their children. This in turn leads to poor performance in that they may not be able to provide enough resources for their children to attend school on a regular basis.

The study further delved into the issue of student performance in mathematics since they joined Form One:

Table 4.8 Distribution of Performance of Mathematics

Grade	Frequency	Percentage
Excellent	0	0.0 %
Very Good	0	0.0 %
Good	31	16.4 %
Average	69	36.5%
Poor	89	47.1%

(Source, Field Study 2018)

From the data above, no students can be classified as excellence or very good in mathematics. 47.1% and 36.5% are poor and average performers respectively while only 16.4 % can be said to be good in mathematics showing that mathematics performance is low.

Finally, the study sought to establish the students' expectations of how they would perform in mathematics in K.C.S.E

Table 4.9 Distribution of Students' Academic Expectations

Grade	Frequency	Percentage
Excellent	0	0.0 %
Very Good	27	14.3%
Good	45	23.8%
Average	67	35.4 %
Poor	50	26.5 %

(Source, Field Study 2018)

From the above data 26.5% still expect to perform poorly and 35.4% expect an average performance .only 23.8% and 14.3% expect good and very good results while none of the respondents expect excellence results. All these shows a poor attitude towards mathematics hence poor grades in the examination results.

The deputy-principals were also asked to state the students' performance in the mock exams that was done on the same year (2018) by the current form four and the findings obtained are showed in the table below. For beyond the scope of this study, the names of the schools have been withheld and instead letters are used as shown

Table 4.10 Mock results

School	Enrolment	Mock performance 2018							
		Pre-Mock		Mock		Post-Mock		Average	
		Index	Grade	Index	Grade	Index	Grade	Index	Grade
A	214	1.7	D-	1.9	D-	2.0	D-	1.9	D-
B	45	3.1	D	3.0	D	3.3	D	3.3	D
C	159	3.4	D	3.5	D+	3.4	D	3.4	D

Source: Academic offices from the three schools

The average performance of school A is a D-(minus) and school B and C both scored an average grade of D (plain), this shows that the performance of mathematics is poor in all the schools which is a worrying trend in the Njiru sub-county

Teachers were also asked to rate the performance of their students in mathematics on a Likert scale as shown in the table below

Table 4.11 students performance in mathematics

Grade	Frequency	Percentage
Excellent	0	0.0%
Very Good	0	0.0%
Good	1	16.7%
Average	2	33.3%
Poor	3	50.0%

(Source, Field Study 2018)

After the analysis of the above data using statistical package for social sciences and Microsoft excel, it was found that 66.7% of the students are of low performance in mathematics while 33.3% are of high performance in mathematics. no student can be rated as a very high performer in mathematics. From the interview questions, teachers also agreed that majority of the students have dismal performance because of negative attitude towards mathematics and teachers also need training to improve on content delivery and that it is possible for the poor performance of mathematics to be raised.

4.4 Teacher Training

Training is crucial for any endeavor to be successful. The researcher sought to find out the level of training of mathematics teachers in Njiru Sub-county.

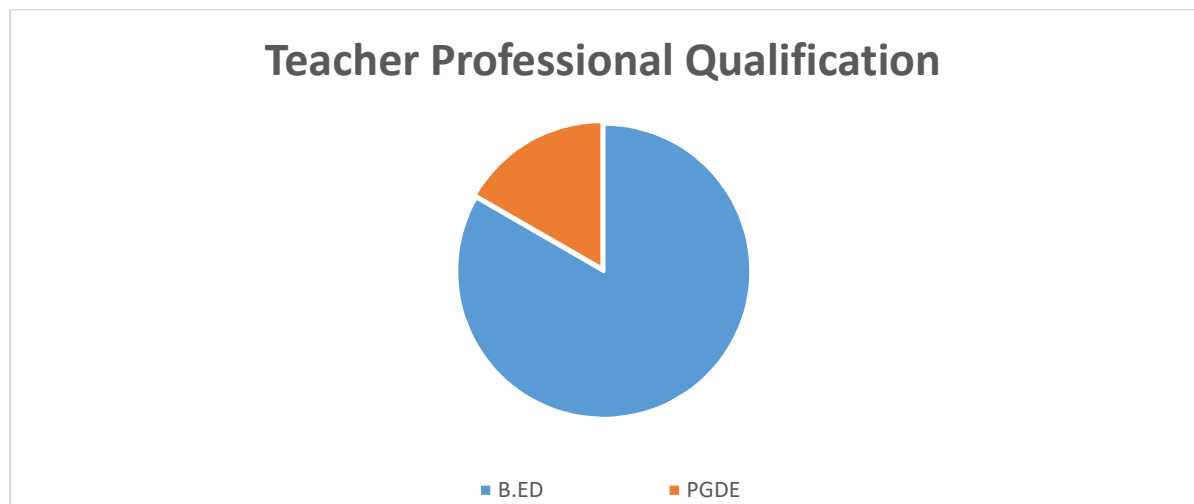
Teachers were also asked to indicate their level of education. The findings are illustrated below:

Table 4.12 Distribution of Teachers Education

Level of Education	Frequency	Percentage
Diploma	0	0.0 %
B.ED	5	83.3 %
PGDE	1	16.7 %
M.ED	0	0.0 %
PHD	0	0.0 %
TOTAL	6	100 %

(Source, Field Study 2018)

Figure 4. 1: Distribution of Teacher Professional Qualification

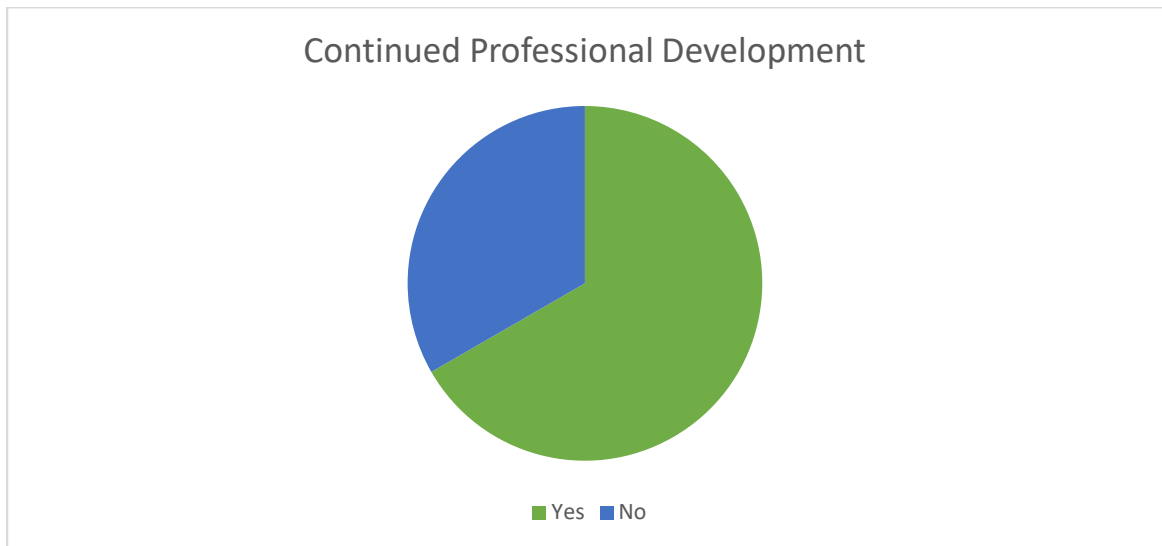


(Source, Field Study 2018)

As illustrated in the figure above, there was no mathematics teacher trained to the PHD and Masters Level. Undergraduates accounted for 83.3% of the teacher population and 16.7 % had post graduate diploma in education, There were no diploma or untrained teachers.

In addition to this, the researcher also queried the teachers on whether they have added to their professional qualifications since they were employed. The findings are as below:

Figure 4.2: Distribution of Continued Professional Development

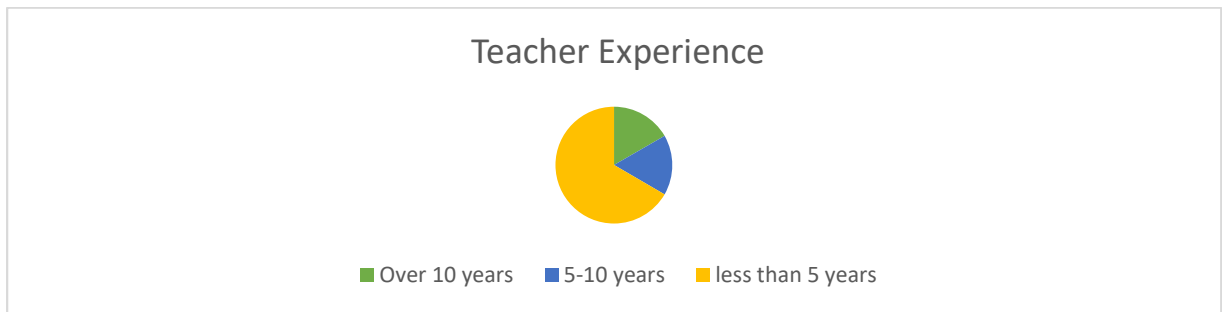


(Source, Field Study 2018)

As illustrated in the chart above, most of the teachers have not undertaken any additional qualification courses since they were employed.

In relation to teacher experience, one of the teachers stated that they had over ten years of training, another had 5-10 years and the rest had less than five years of experience. Figure 6 below represents the statistics on teacher experience.

Figure 4. 3: Distribution of Teacher Experience



(Source, Field Study 2018)

4.5. Student Attitude

In order to find out students' attitude towards mathematics, the researcher asked five questions. The first question was whether the students strained when studying mathematics. The responses given are shown in table 4.11 below:

On whether they thought that their teachers were capable, a majority of the students agreed that their teachers were qualified and that they revised with them in class.

Table 4.13 Students Strain When Studying Mathematics

	Frequency	Percentage
Strongly Disagree	31	16.4 %
Disagree	39	20.6 %
Uncertain	23	12.2 %
Agree	69	36.5 %
Strongly Agree	27	14.3 %
TOTAL	189	100 %

(Source, Field Study 2018)

Out of the 189 respondents 14.3 % strongly agreed with the statement, 36.5 agreed, 12.2 % were uncertain, 20.6 % disagreed while 16.4 % strongly disagreed. This data shows that majority of the students generally strain when studying mathematics leading to downward spiral in their performance.

The next question was whether the student liked Mathematics as a subject. Their responses are outlined below:

Table 4.12: I like Mathematics as a subject

	Frequency	Percentage
Strongly Disagree	54	28.6 %
Disagree	43	22.8 %
Uncertain	27	14.3 %
Agree	36	19.0 %
Strongly Agree	29	15.3 %
TOTAL	189	100

(Source, Field Study 2018)

From the above data, those who agreed that they like mathematics are represented by 19.0 % and 15.3 % respectively while those who disagreed with the statement are 28.6 % and 22.8 % respectively. This shows that a majority of students do not like Mathematics.

The researcher also posed the question on whether they experienced difficulties and stress when solving mathematical problems, with their responses being as shown in the table below:

Table 4.14: I experience difficulties and stress when solving mathematical problems

	Frequency	Percentage
Strongly Disagree	43	22.8 %
Disagree	30	15.9 %
Uncertain	25	13.2 %
Agree	32	16.9 %
Strongly Agree	59	31.2 %
TOTAL	189	100 %

(Source, Field Study 2018)

According to the table, 31.2 % of the students strongly agreed that they experience difficulties in solving mathematical problems, with 16.9 % agreeing and 15.9 % and 22.8 % disagreeing and strongly disagreeing with the statement. It can therefore be concluded that a majority of students face difficulties when solving mathematical problems.

Question 4 sought to find out whether students felt uneasy and confused during mathematics lessons. The findings are as shown below:

Table 4.15: I feel uneasy during Mathematics lessons

	Frequency	Percentage
Strongly Disagree	43	22.8 %
Disagree	27	14.3 %
Uncertain	15	07.9 %
Agree	63	33.3 %
Strongly Agree	41	29.6 %
TOTAL	189	100 %

(Source, Field Study 2018)

The researcher found out that out of the 189 students, only less than 37.1 % of the students reiterated that they are not uneasy and confused about mathematics while over 62.9 % of the students said that they are uneasy and uncomfortable with the subject.

The last question was on whether the students had a willingness and desire to increase their knowledge and skill in mathematics after secondary education.

Table 4.16: I have a willingness and desire to increase my knowledge and skill in Mathematics.

	Frequency	Percentage
Strongly Disagree	53	28.0 %
Disagree	41	21.7 %
Uncertain	16	08.5 %
Agree	35	18.5 %
Strongly Agree	44	23.3 %
TOTAL	189	100 %

(Source, Field Study 2018)

Out of the 189 students, 23.3 % strongly agreed that they had a willingness and desire to increase their knowledge and skill in mathematics. 18.5 % agreed, while 21.7 % and 28.0 % disagreed and strongly disagreed respectively. Majority of the students showed a strong desire not to increase their knowledge and skill in mathematics after secondary education thus demonstrating a negative attitude towards the subject.

According to the responses that the researcher got from the teachers, it was observed that a large percentage of the students had a negative attitude towards mathematics as they perceived it to be difficult, straining and stressful. The teachers reiterated that of the students they had taught mathematics over the years, 54.7 % stated that they did not like mathematics as they found it difficult to grasp the concepts taught, 83.3 % said that their students strained while studying mathematics, and over 57.0 % would not take

mathematics if it was not a compulsory subject. According to the researcher’s personal observations, students were found to be lackadaisical in studying mathematics, and would rather much put it off unless necessary

Teachers further reiterated that the performance of their students in mathematics since form one was average for most of the students. A few were however high performers.

4.6 Availability of Teaching and Learning Resources

Availability of resources in educational institutions greatly influences student achievement. This is because they facilitate continued learning processes thus increasing effectiveness and academic achievement.

The study sought to determine the view of the students on the adequacy of physical facilities and instructional materials in their schools. The responses are given in the table below:

Table 4.17 Distribution of Availability and Adequacy of Resources

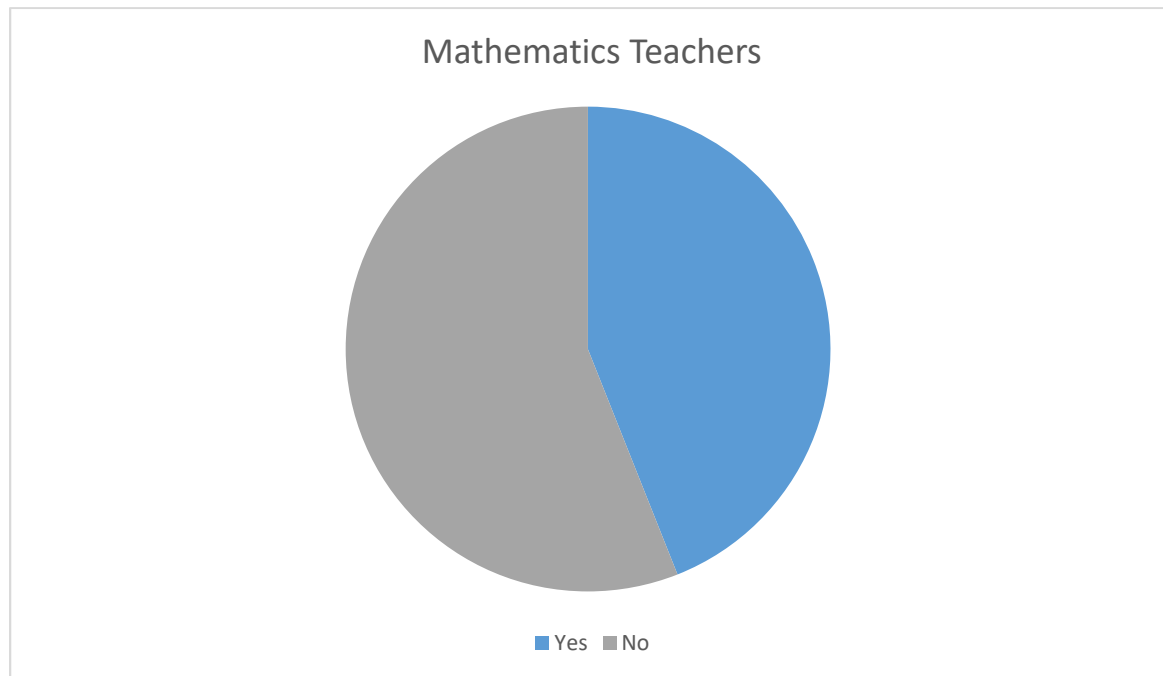
		Adequacy (%)				
		SD	D	U	A	SA
i)	We have enough classrooms in our school and study rooms separate from the normal classrooms	30.7	25.4	10.6	26.5	06.8
ii)	Every student in our school has a chair and a locker	29.1	28.0	9.0	28.6	05.3
iii)	We have adequate teaching aids	33.3	25.9	10.6	15.9	14.3
iv)	We have revision papers that help during our personal study time	40.7	31.2	12.2	11.1	4.8
v)	Our library is well equipped	33.3	25.9	6.9	29.1	4.8

(Source, Field Study 2018)

From table 4.16, it can be seen that 30.7% strongly disagree that they have enough classrooms, 25.4% disagree, 10.6 % are uncertain, 26.5% agree while 6.8% strongly agree. On the issue of furniture, 29.1% strongly disagree, 28.0% disagree, 9.0 % are uncertain, 28.6% agree while 5.3% strongly agree. 33.3% strongly disagree that they have enough teaching aid, 25.9% disagree, 10.6 % are uncertain, 15.9% agree while 14.3% strongly agree. Concerning revision materials, 40.7% strongly disagree that they have enough revision materials, 31.2% disagree ,12.2 % are uncertain,11.1% agree while 4.8% strongly agree .again 33.3% strongly disagree that they have well equipped library, 25.9% disagree ,6.9 % are uncertain,29.1% agree while 4.8% strongly agree .The researcher therefore concluded that most schools within Njiru sub-county do not have enough teaching and learning resources.

In terms of adequacy of mathematics teachers, 44 % of the students indicated that they considered the number of mathematics teachers in their school to be adequate, while 56% stated that they did not think so. The results are presented in the pie chart below

Figure 4.4: Distribution of Mathematics Teachers



(Source, Field Study 2018)

The study sought to determine from teachers whether the provision of resources help improve performance in mathematics. The results are shown in the table below:

Table 4.17 Distribution of Impact of Resources on Performance

Learning Resources		Very High	High	Low	No Influence
i)	Availability of textbooks	81	57	45	6
ii)	Revision papers	78	60	47	13
iii)	Well-equipped library	79	52	41	17
iv)	Well- equipped classrooms	69	57	45	18
v)	Adequate sanitation facilities	56	51	50	32

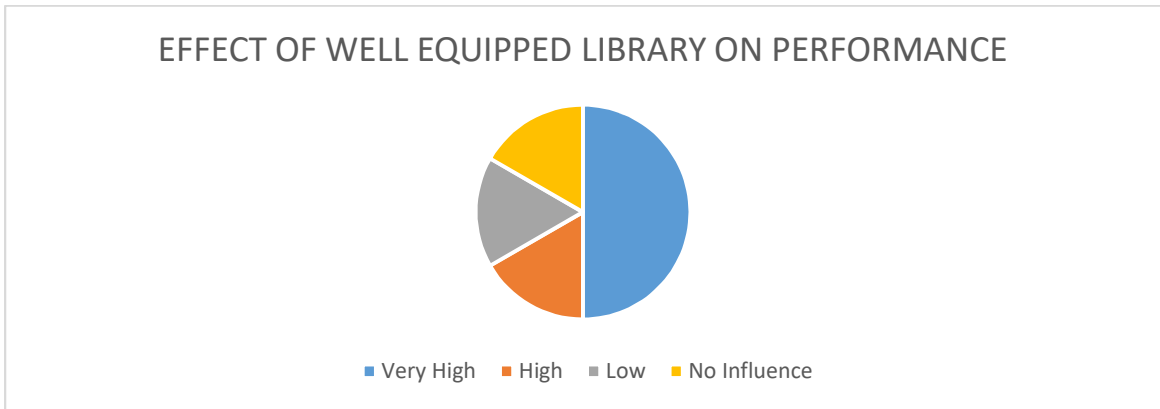
(Source, Field Study 2018)

From the findings, it was clearly demonstrated that the availability of textbooks positively impacts performance of students as 42.9% of the teacher responses clearly outlined.

The study also sought to establish the effect of availability of revision papers on student performance. 42.3 % of the teachers reiterated that the influence was very high, none of the teachers responded that the effect was low or that there was no influence. The findings indicate that most of the teachers were in agreement that the use of revision papers leads to good academic performance.

The effect of a well- equipped library on performance was also one of the factors that was investigated. The results are demonstrated in the figure below:

Figure 4.5 : Effect of Well Equipped Library on Performance

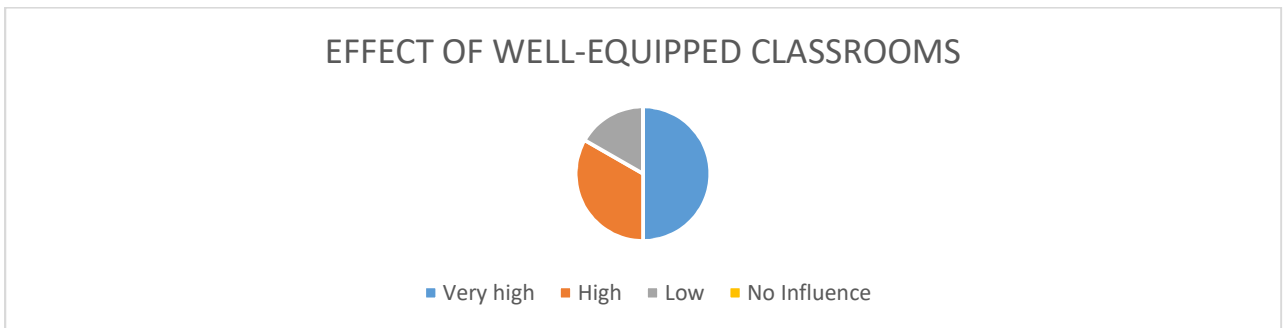


(Source, Field Study 2018)

A well-equipped library, complete with good ventilation, desks, chairs, relevant reference books and electricity are necessary for effective learning. Reference books are very important as they give the student an opportunity to get more material on what has already been taught. In addition to this, most reference books have practice questions which the learner can revise with to test and increase their level of understanding of concepts already taught in class.

The chart below shows teacher’s responses on the effect of well-equipped classrooms on performance:

Figure 4.6: Effect of Well Equipped Classrooms on Performance



(Source, Field Study 2018)

The above findings illustrate that performance is very high (50%) in schools where classes are well equipped in contrast to those that are not.

On the influence of sanitation facilities on performance, 29.6 % of the teachers said that it had a positive impact on performance to a very high extent, while 27.0 % indicated high influence. This is because sanitation facilities are crucial to ensuring the well-being of the learner, which in turn influences academic performance. As such, the performance of the learner that has access to adequate sanitation facilities tends to be higher than that of the one with little or no access to the same.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the summary, conclusions of the findings of the study and recommendations for further research.

5.2 Summary

The study tried to survey the components that impact the performance of mathematics in secondary schools in Njiru Sub-province. It was guided by three goals; the main target looked to decide how the educator preparing impacts the execution of Mathematics in blended Secondary Schools in Njiru Sub-County, the second to investigate how understudy demeanors impact the execution of Mathematics in blended Secondary Schools in Njiru Sub-County lastly the third one tried to inspect how the accessibility of instructing and learning assets impacts the execution of Mathematics in blended Secondary Schools in Njiru Sub-County. The examination depended on the frameworks hypothesis by Bertalanffy (1956). The clear review technique was utilized. The objective populace involved 60 educators and 1800 frame four understudies in Njiru Sub County, An example of 3 agent principals, 3 instructors and 313 shape four understudies were chosen through straightforward arbitrary inspecting. Polls and meetings and individual perceptions were utilized to gather information from the respondents. The arrival rate for the polls was 60.4%. Information was investigated subjectively and quantitatively utilizing the Statistical Package for Social Sciences. It was exhibited in type of rates, tables, and straightforward pie outlines. The discoveries and investigation demonstrate that accessibility of assets, understudy states of mind towards science and educator preparing unmistakably impact the execution of Mathematics.

5.3 Conclusions

The study concluded that availability of resources in terms of physical facilities, material and human resources has an influence on the performance of mathematics. As such, it emerged that schools that had adequate resources such as reference books, student textbooks & teachers guides ,teaching & revision materials, teachers, desks, chairs among others tended to record better performance as compared to those without. This was

attributed to the fact that in schools with resources, students had more exposure leading to better performance. This study has brought to the fore the general lack of continued teacher development and training as most of the mathematics teachers had not taken effort to increase their education level once they had been employed. Finally, the study concluded that attitudes depending on whether they are positive or negative influence student performance in Mathematics. It emerged that attitudes are formed from prior experiences, environmental factors and peer influence.

5.4 Recommendations

The foregoing analysis has revealed very pertinent issues regarding the need for improved performance in Mathematics in Njiru Sub-County. The study makes a number of recommendations: Mathematics teachers should attend strengthening of mathematics and Sciences in Secondary Schools (SMASSE) workshops for professional development. There should also be increased teamwork among mathematics teachers in secondary schools to improve performance of mathematics. The Ministry of Education should also endeavor to provide teaching and learning resources for schools, not only in increased quantity but also in terms of quality. In-service trainings for mathematics teachers with regard to teaching methods, use of teaching resources and student assessment should be organized to facilitate improvement in Mathematics. In relation to attitude, this should be worked on at a tender age preferably primary school. This is far more effective because when attitudes are developed at a younger age, they are more likely to remain even in older age. In addition, mathematics teachers need to motivate their students so that they develop a positive attitude towards the subject. Students who perform in the subject should also be given incentives to encourage them to improve, and to motivate students who have been recording poor performance to work harder towards a better score. More resources should be allocated toward the instruction of mathematics and finally there should be more incentives for mathematics teachers.

5.5 Suggestions for Further Research

This research will pave way for other scholars to carry out further studies on the factors that influence Mathematics performance in the whole country. This will enable educational stakeholders to find out if the factors are county specific or generalized to the whole country, enabling them to come up with more specialized solutions. It will also guide educational institutions on the measures to be adopted to ensure the trend of dismal performance in Mathematics comes to an end. This study only focused on the effect of student attitude, availability of resources, and teacher training on the performance of Mathematics in the Kenya Certificate of Secondary Education. Further research can be conducted to ascertain the influence of other factors such as syllabus coverage, student background and instructional methods on performance.

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APPENDICES

APPENDIX 1: INTRODUCTORY LETTER

KENN OYUGI
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Nairobi.

Dear Participant,

I am a post graduate Diploma student at the University of Nairobi Kikuyu campus undertaking a research on Factors affecting students' performance in mathematics at K.C.S.E level in Njiru sub-county, Nairobi

I kindly request you to answer each question honestly and be assured that information given will be treated with utmost confidentiality and be used purely for this research.

Yours faithfully,

Oyugi Kenn
Reg. No. L40/90081/2016

APPENDIX II: STUDENT QUESTIONNAIRE

TOPIC: FACTORS AFFECTING THE PERFORMANCE OF MATHEMATICS
IN SECONDARY SCHOOLS IN NJIRU SUB-COUNTY

Please tick whichever you think is appropriate in the boxes provided.

Section A. Demographic information

1. What is your gender? Male () Female ()
2. Age: How old are you? 15-18 years () Above 18 years ()
3. Whom do you live with? Both parents () Mother () Relative () Father ()
4. What is the occupation of your parents/guardians?
Unemployed () Self-Employed () Casual () Professional ()
5. Please Indicate your parents / guardians level of education with a tick in the boxes provided.

	Primary level	Secondary level	Tertiary level	university
Father				
Mother				
Guardians				

Section B. Availability of Resources

Using a scale of 1 to 5, Indicate the degree to which you agree or disagree with the below statements. 1= Strongly Disagree (SD), 2 = Disagree (D), 3= Uncertain (U) , 4=Agree (A) 5= Strongly Agree (SA)

	SD	D	U	A	SA
(B i) Each student has a mathematics textbook in our class					
(B ii) Each student has their own calculator					
(B iii) Each class has a chalkboard					
(B iv) We have adequate teaching aids					

(B v) We have revision papers that help during our personal study time					
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6. Using a scale of 1 to 5, Indicate the degree to which you agree or disagree with the below statements. 1= Strongly Disagree (SD), 2 = Disagree (D), 3= Uncertain (U) , 4=Agree (A) 5= Strongly Agree (SA)

	SD	D	U	A	SA
(B vi) We have enough classrooms in our school					
(B vii) Every student in our school has a chair and a locker					
(B viii) We have study rooms separate from the normal classrooms					
(B ix) Each student has access to a mathematics textbook					
(B x) Our library is well equipped					

7.What has been your average performance in Mathematics since you joined Form one?

Poor () Average () Good () Very Good () Excellence ()

8. How can you rate your expectation in mathematics in the Kenya Certificate of Secondary Education KCSE?

Poor () Average () Good () Very Good () Excellence ()

9.State your most favorite subject?

10.Do you find it easy to do Mathematics with a colleague? Yes () No ()
 Unsure ()

Explain your reason

11.Indicate the degree to which you agree or disagree with the below statements.

1= Strongly Disagree (SD), 2 = Disagree (D), 3= Uncertain (U) , 4=Agree (A), 5= Strongly Agree (SA)

	SD	D	U	A	SA
(B xi) I'm always under strain when studying mathematics and during mathematics lessons					
(B xii) I like Mathematics as a subject					
(B xiii)I find it difficult to solve mathematical problems					
(B xiv)I feel uneasy, confused and impatient whenever mathematics is being taught					
(B xv)I have a willingness and desire to undertake a mathematics related course after completing secondary education					

7. If mathematics was not a compulsory subject in secondary school, would you select it as one of your preferred subjects? Yes () No () Unsure ()

Section C: Teacher Training and Experience

8. Do you have enough teachers? Yes() No () Please give any comments you may have about your teacher's competence, teaching methods, and whether they revise with you in class _____

Thank you for your participation

APPENDIX III: TEACHER QUESTIONNAIRE

TOPIC: FACTORS AFFECTING THE PERFORMANCE OF MATHEMATICS
IN SECONDARY SCHOOLS IN NJIRU SUB-COUNTY

Please tick whichever you think is appropriate in the boxes provided

SECTION A: Background Information

1. Please indicate your gender : Male () Female ()
2. Age: 18-29yrs () 30-39yrs () 40-49yrs () 50-59yrs () 60-69yrs ()
Over 70yrs

Section B: Availability of Resources

3. To what extent do you agree with the following statements? Select the option that most closely reflects your opinion. 1= Strongly Disagree (SD), 2 = Disagree (D), 3= Uncertain (U) , 4=Agree (A), 5= Strongly Agree (SA)

	SD	D	U	A	SA
(Bi) The school where I teach has enough physical facilities to facilitate the mathematical instruction process (physical facilities include classrooms, study rooms, desks and lockers)					
(Bii) The school where I teach has enough mathematics teachers to cater for the whole school					
(Biii) In my view, we have sufficient instructional materials for mathematics as a subject.					
(Biv) Our library had adequate reference materials for mathematics					
(Bv) I have access to a teacher’s guide					

4. Does the provision of the following resources help improve mathematics performance in your school? 1= Strongly Disagree (SD), 2 = Disagree (D), 3= Uncertain (U) , 4=Agree (A) 5= Strongly Agree (SA)

	SD	D	U	A	SA
(Bvi) Revision papers					
(Bvii) Well-equipped library					
(Bviii) Availability of calculators and geometrical sets					
(Bix) Availability of textbooks					
(Bx) Adequate class furniture e. g desks, chairs etc.					

Section C: Attitude

5. To what extent do you agree with the following statements? Select the option that most closely reflects your opinion. 1= Strongly Disagree (SD), 2 = Disagree (D), 3= Uncertain (U) , 4=Agree (A), 5= Strongly Agree (SA)

	SD	D	U	A	SA
(Ci)I consider mathematics to be a difficult subject					
(Cii) Students have complained to me that they strain when studying mathematics and during mathematics lessons					

(Ciii) I have noticed that most students do not like Mathematics					
(Civ) Most students uneasy, confused and impatient whenever mathematics is being taught					
(Cv) Students tend to have a poor attitude towards mathematics					

6. Please explain your answer in (v) above:

7. Section D: Teacher Training

Please tick whichever option you think is appropriate:

8. Indicate your professional qualification : Diploma PGDE B. ED M. ED PH.D
9. How long you have taught in your present school?
 Less than 5 years 5-10 years above 10 years
10. What is your teaching experience? Below 5 years 5-10 years
 11-15years 16-20 years 21-25 years
 above 25 years
11. Have you undertaken any additional professional development course since you were employed? If so, please indicate the qualification and the year you attained it _____

Section E: Structured Interview questions for teachers

12. Please rate the performance of your students in Mathematics over the last five years
 Poor Average Good Very Good Excellence
13. Do you agree that majority of the students perform poorly in mathematics?

Yes () No ()

14. Most student fail because they have negative attitude? Yes () No ()

15. It is possible to redeem the performance of mathematics within the Njiru sub-county? Yes () No ()

16. Do you feel you are trained enough to deliver good results? Yes () No ()

Thank you for your participation in this study

APPENDIX IV: WORK PLAN

Time activity	May 2018	June	July	Aug.	Sept	Oct	Nov
Identification and presentation of research problem							
Gathering of related literature							
Proposal Writing and Compiling							
Submission of the Proposal							
Data Collection/analysis							
Project Writing and Compiling/presentation							

APPENDIX V: BUDGET

ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
1	Stationery	Reams	3	500.00	1,500.00
2	Transport				15,000.00
3	Lunch	Number	5	500.00	2,500.00
4	Printing	Copies (60 pages each)	15	.00	9,000.00
5	Binding	Copies (60 pages each)	15	100.00	1,500.00
6	Data Entry and Analysis	Number (Respondents)	189	100.00	18,900.00
7	Internet				4,000.00
8	Miscellaneous				5,000.00
	Total				57,400.00