

**EFFECTS OF TEACHING METHODS ON THE PERFORMANCE OF STUDENTS IN
MATHEMATICS IN EMUHAYA CONSTITUENCY, VIHIGA COUNTY, KENYA**

**ERICK OMBOKO
EDU-G-4-1514-21**

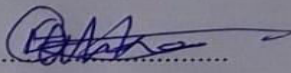
**A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF EDUCATION
ARTS IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
AWARD OF THE DEGREE OF BACHELOR OF EDUCATION, HUMANITIES
AND SOCIAL SCIENCES OF GRETSA UNIVERSITY**

DECEMBER, 2024

DECLARATION

DECLARATION

This project proposal was my original work and has not been presented for award of a other institution.

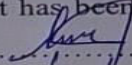
Signature 

date 09/12/2024

ERICK OMBOKO
EDU-G-4-1514-21

SUPERVISOR

This project has been submitted with my approval as a university supervisor

Signature..... 

Date 09/12/24

MOSES KIOKO
GRE TSA UNIVERSITY

Contents

DECLARATION.....	ii
ABBREVIATION	vii
ACKNOWLEDGMENT	viii
ABSTRACT	ix
CHAPTER ONE: INTRODUCTION.....	1
1.0 Introduction.....	1
1.1 Background of the study	1
1.2 Statement of the Problem.....	3
1.3 Purpose of the Study	4
1.4 Conceptual Framework.....	4
1.5 Objectives of the Study	4
1.5.1 General Objective	4
1.5.2 Specific objectives	5
1.6 Research Questions	5
1.7 Significance of the Study	5
1.8 Scope of the Study	6
1.9 Hypotheses of the study	6
1.9.1 Null Hypotheses (H0):	6
1.9.2 Alternative Hypotheses (H1):	6
CHAPTER TWO: LITERATURE REVIEW.....	8
2.1 Introduction.....	8
2.2 Theoretical framework Behaviorist Learning Theories	8
2.3 Theory of performance.....	8
2.4 Teaching Method	9
2.5 Types of Teaching Method	10
2.5.1 Student's performance in Mathematics	11
2.6 Empirical Review.....	13
CHAPTER THREE: RESEACH METHODOLOGY	16
3.1 Introduction.....	16
3.2 Research Design.....	16
3.3 Study area.....	16
3.4 Target Population.....	16
3.5 Sampling Design	17
3.6 Sample size	17
3.7 Research Instruments	18
3.8 Data Analysis	18
3.8.1 Method of Data Analysis	18
3.8.2 Model Specification.....	19
CHAPTER FOUR: FINDINGS AND DISCUSSION	20
4.1 Introduction.....	20
4.2 Overview of the Findings.....	20

4.3 Demographic Information.....	20
4.4 Teaching Methods.....	21
4.5 Student Perception	22
4.4 Regression analysis.....	22
4.5 Coefficients.....	24
4.6 Challenges in Mathematics Class	24
4.8 Learning Resources.....	25
4.9 Socioeconomic Factors	26
4.10 General Comments and Suggestions.....	26
4.11 Common Suggestions	26
4.12 Discussion of the Findings	27
4.13 Implications of the Findings.....	27
4.13 Conclusion	27
CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	28
5.1 Introduction.....	28
5.2 Summary of Findings.....	28
5.2.1 Teaching Methods	28
5.2.2 Student Perceptions.....	28
5.2.3 Teacher Competence.....	28
5.2.4 Learning Resources.....	29
5.2.5 Socioeconomic Factors	29
5.3 Conclusions.....	29
5.3.1 Effectiveness of Teaching Methods	29
5.3.2 Importance of Teacher Competence	29
5.3.3 Role of Learning Resources.....	29
5.3.4 Impact of Socioeconomic Factors.....	29
5.4 Recommendations for Policy or Practice	29
5.4.1 Enhance Teaching Methods	29
5.4.1 Improve Teacher Competence.....	30
5.4.2 Ensure Adequate Learning Resources.....	30
5.4.3 Address Socioeconomic Disparities	30
5.5 Recommendations for Further Research	30
5.5.1 Longitudinal Studies	30
5.5.1 Impact of Technology	30
5.5.2 Teacher Training Programs.....	30
5.5.3 Socioeconomic Interventions.....	30
5.6 Conclusion	31
REFERENCES	32
QUESTIONNAIRES	34

ABBREVIATION

ANOVA	:	Analysis of Variance
ICT	:	Information and Communication Technology
IEP	:	Individualized Education Program (related to special education)
K-12	:	Kindergarten through 12th grade (referring to primary and secondary education)
KE	:	Kenya
LMS	:	Learning Management System
OLS	:	Ordinary Least Squares (a statistical method)
PD	:	Professional Development
RQ	:	Research Question
SD	:	Standard Deviation
SES	:	Socioeconomic Status
STEM	:	Science, Technology, Engineering, and Mathematics
VC	:	Vihiga County

ACKNOWLEDGMENT

I wish to acknowledge my supervisor Moses Kioko for equipping me with necessary knowledge towards writing this project. I also wish to acknowledge all my lecturers at Greta University for their contribution and commitment and guiding me throughout my education. Thanks to you.

ABSTRACT

This study has investigated the influence of teaching methods on the academic performance of Mathematics students in public secondary schools located within Emuhaya Constituency, Vihiga County, Kenya. Rooted in Behaviorist Learning Theories and the theory of performance, the research aimed to assess how different teaching methods affect educational outcomes in Mathematics. The study employed a survey research design, utilizing census sampling to select 156 participants from three strategically chosen secondary schools in Emuhaya Constituency. Primary data was collected through a meticulously designed structured questionnaire. The collected data underwent rigorous analysis, employing multiple linear regression to test various hypotheses. In Chapter Four, the findings were interpreted and discussed based on the study objectives. Key findings included the positive impact of the Demonstration Method and the Discussion Method on students' academic performance in Mathematics ($p < 0.05$) it indicates that the finding is statistically significant, meaning there is less than a 5% probability that the observed result occurred due to random chance.. Conversely, Teachers' Proficiency showed a statistically significant negative relationship with students' performance in Mathematics ($p < 0.05$), confirming initial research hypotheses. Chapter Five provided a summary of findings, conclusions, and recommendations. The findings highlighted the effectiveness of interactive teaching methods like the Demonstration and Discussion Methods in enhancing student performance. Recommendations emphasized the need for teacher training in effective pedagogical approaches and the importance of adequate learning resources. Further research suggestions included longitudinal studies on teaching methods and the impact of emerging technologies in Mathematics education. The anticipated results from the regression analysis confirmed the hypotheses, providing compelling insights into the factors influencing Mathematics education in Emuhaya Constituency, Vihiga County, Kenya.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter focuses on, background of the study, statement of the problem, purpose of the study, conceptual framework, research questions, objectives, significance of the study, scope of the study and the hypothesis of the study.

1.1 Background of the study

Mathematics, as one of the oldest and most fundamental fields of human knowledge, has consistently played a central role in shaping human thought and intellect. It has been widely recognized for centuries as a discipline that sharpens the human mind, fosters logical thinking, enhances reasoning ability, and bolsters spatial reasoning skills. The influence of mathematics on personal development and its contribution to a nation's prosperity cannot be overstated. This was primarily because mathematics serves as the foundation for many successful careers and consequently, successful lives. The development of mathematical skills relevant to daily life was a critical component of the school mathematics curriculum.

Cockcroft (2012) emphasizes the universal importance of mathematics education, stating that every child should engage with Mathematics during their school years. Mathematics, along with English, is widely regarded as an essential subject, as evidenced by the substantial amount of time allocated to its instruction in schools worldwide. In many countries, Mathematics was a compulsory subject at both primary and secondary levels of education. One key reason for Mathematics' enduring significance in school curricula was its historical role as a filter for entry into various professions, a role it has effectively played over the past two centuries (Howson & Wilson, 2016). Another compelling reason for the study of Mathematics is the inherent interest and enjoyment it offers, along with its clarity, challenges, and intrinsic appeal. The intrinsic interest and appeal of Mathematics provide yet another crucial justification for the teaching of Mathematics in schools. In the African context, as in other parts of the world, Mathematics holds a prestigious position in school curricula.

In Nigeria, deliberate efforts have been made to enhance the effectiveness of Mathematics education, including making Mathematics a compulsory subject during the formative years of education (Miheso 2012). Mathematics holds a special status in the school curriculum, being designated as one of the core subjects and receiving more instructional time than science. It remains

a core and compulsory subject in primary and secondary schools in Nigeria. However, despite the essential role of Mathematics in daily life and the curriculum, students' performance in Mathematics remains subpar, often attributed to the teaching methods employed by educators.

This concern has prompted significant outcry from teachers of Mathematics teachers, educators, parents, and students alike, largely due to the poor performance of students in the subject.

By the 1990s, these concerns gave rise to mounting apprehensions about teaching methods, mathematical competency, and arithmetical skills among secondary school students. A resounding question that persisted throughout the 1980s and into the 1990s was why many school graduates exhibited significant mathematical illiteracy.

Moreover, Mathematics was not only a subject of academic significance but also a body of knowledge crucial for the advancement of a scientific and technological nation. The level of mathematical proficiency and ingenuity serves as a defining line between developed and underdeveloped nations (Ale and Lawal, 2010). Mathematics was a vital driver of national development and wealth creation. Nations that prioritize Mathematics, science, and technology generally enjoy a higher standard of living and reduced dependence on external sources (Nosa and Ohenhen, 2018).

In today's rapidly globalizing world, individuals must possess a solid understanding of mathematical concepts and reasoning methods to navigate effectively. Mathematics knowledge promotes precision, logical thinking, systematic organization of information, and the ability to think critically and solve problems independently (Adedayo, 2017). It equips individuals with the skills to address a wide range of practical challenges they may encounter in life.

However, the declining performance of students in Mathematics demonstrates the shortcomings of the current teaching delivery system. The teaching and learning environment should emphasize active student participation and employ effective learning approaches that facilitate knowledge retention. Active participation and cooperative learning approaches enable students to grasp concepts better and learn through practical experiences (Olaitan and Ogundoyin, 2015).

Given the significance of Mathematics education and the critical role of teaching methods, this study delves into the impact of various teaching methods on the academic performance of students in Emuhaya Constituency, Vihiga County, Kenya. The investigation aims to shed light on the relationship between teaching methods and students' Mathematics performance in this specific region.

1.2 Statement of the problem

The teaching and learning of Mathematics face a significant challenge in Emuhaya Constituency, Vihiga County, Kenya. Despite the pivotal role Mathematics plays in education and the wider societal context, it has been observed that a substantial number of teachers persist with traditional teaching methods that offer little in terms of engagement, interest, or enjoyment for learners. Eniayeju and Azuka (2010) pointed out that a vast majority of teachers in the National Mathematical Centre workshops, spanning the period from 2002 to 2010, continued to rely on conventional teaching methods. This traditional approach often leads to the mere introduction of topics, followed by exercises from textbooks that are solved for students, with an expectation of rote memorization of formulas and facts. Regrettably, students are not always encouraged to inquire or engage in questioning.

Research findings on Mathematics performance and the declining academic achievement of students provide clear evidence of the inadequacies of this conventional delivery system. These shortcomings in the teaching and learning of Mathematics have resulted in a pressing issue that demands attention. In any effective teaching and learning environment, active student participation and the use of learning approaches that promote knowledge retention are critical dimensions. Studies in pedagogy have emphasized that students learn best by doing and experiencing (Olaitan and Ogundoyin, 2015). In a demonstrative and discussion-based learning approach, students and teachers engage in dynamic interaction within the classroom. When students collaborate in cooperative groups, they not only share and receive information but also develop fresh insights and perspectives, cultivating effective communication skills in a socially acceptable manner.

Given these critical aspects of teaching and learning, the central problem to be addressed in this study is the extent to which various teaching methods have impacted the academic performance of students in selected secondary schools in Emuhaya Constituency, Vihiga County, Kenya. The study aims to investigate how different teaching methods influence students' proficiency in Mathematics and whether the utilization of more engaging and interactive methods can lead to improved academic performance in this specific geographical context.

1.3 Purpose of the study

The primary purpose of this research is to comprehensively examine the impact of teaching methods on the academic performance of students in Mathematics within the specific context of Emuhaya Constituency, Vihiga County, Kenya.

1.4 Conceptual framework

Conceptual framework gives an idea of the association between in fluence among the valuables informing the information and helping in achieving the set goals (Kothari 2004) describes an independent variable as the variable presumed to give rise to variability in the dependent variable. The main aim of a conceptual framework is to particularly classify and give a detailed account of the idea closely connected to the investigation and give a representation of the association between them. This is graphically represented below.

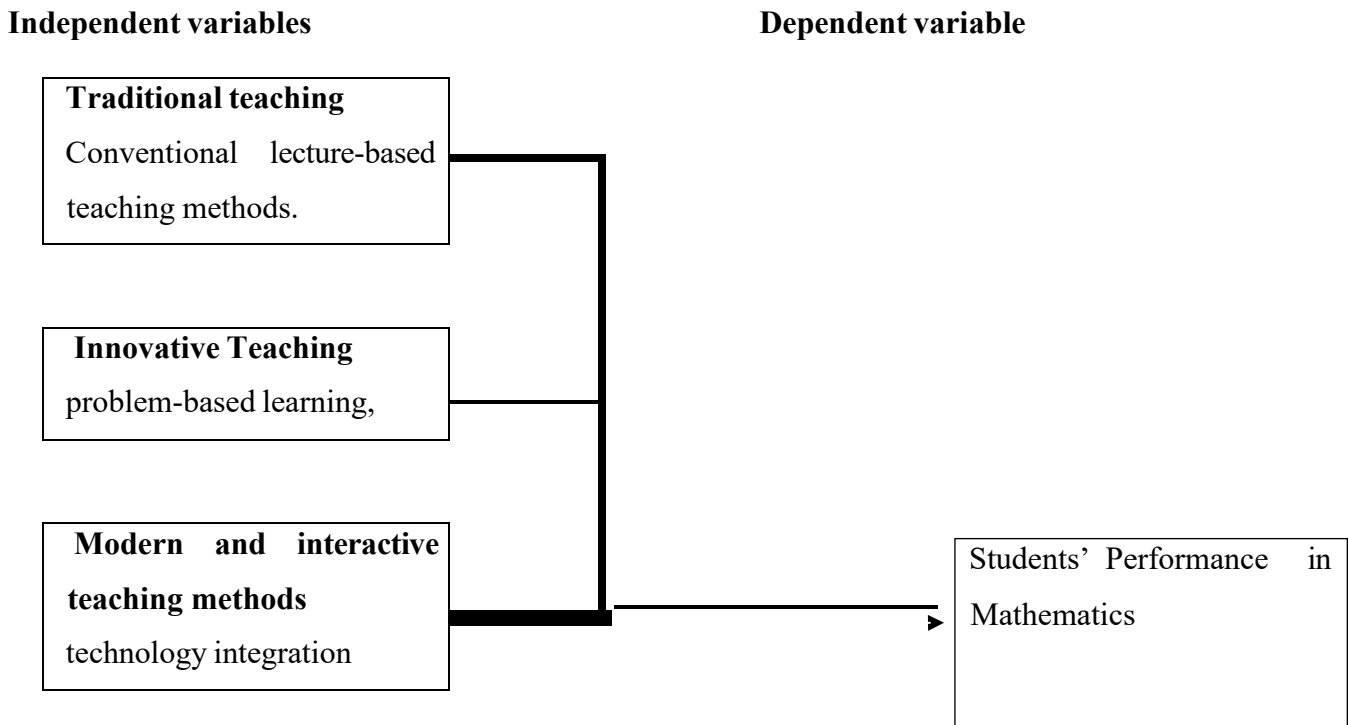


Figure 1:

1.5 Objectives of the study

1.5.1 General objective

To investigate the impact of teaching methods on the academic performance of students in

Mathematics in Emuhaya Constituency, Vihiga County, Kenya.

1.5.2 Specific objectives

- (i) To access how traditional teaching contributes to the performance of students' in Mathematics in Emuhaya Constituency, Vihiga County, Kenya.
- (ii) To analyse how innovative teaching contributes to the performance of students' in Mathematics in Emuhaya Constituency, Vihiga County, Kenya.
- (iii) To evaluate modern and interactive teaching methods contributes to the performance of students' in Mathematics in Emuhaya Constituency, Vihiga County, Kenya.

1.6 Research questions

- I. How does traditional teaching contribute to the performance of students' in Mathematics education in Emuhaya Constituency, Vihiga County, Kenya?
- II. To what extent does innovative teaching contribute to the performance of students' in Mathematics education in Emuhaya Constituency, Vihiga County, Kenya?
- III. How does modern and interactive teaching methods contribute to the performance of students' in Mathematics education in Emuhaya Constituency, Vihiga County, Kenya?

1.7 Significance of the study

The significance of the study on the "Effects of Teaching Methods on the Performance of Students in Mathematics in Emuhaya Constituency, Vihiga County, Kenya" lies in its potential to contribute to the improvement of Mathematics education in the region and beyond. Here are the key points highlighting the significance of the study:

Educational Improvement: Understanding the impact of teaching methods on student performance in Mathematics can lead to the development of more effective and tailored instructional strategies. This, in turn, can enhance the overall quality of education in Emuhaya Constituency and similar regions.

Informed Decision-Making: The research findings was providing educational authorities, policymakers, and school administrators with evidence-based insights on which teaching methods are most effective. This information can guide decisions on curriculum design and teacher training.

Enhanced Student Outcomes: By identifying teaching methods that positively affect student performance, the study can contribute to the academic success of students in Emuhaya

Constituency, potentially narrowing achievement gaps and improving educational equity.

Teacher Professional Development: Understanding the role of teacher competence in the effectiveness of teaching methods can inform professional development programs for educators. It can help them acquire the skills and knowledge needed to deliver quality Mathematics education.

1.8 Scope of the study

The scope of the study, "Effects of Teaching Methods on the Performance of Students in Mathematics in Emuhaya Constituency, Vihiga County, Kenya," defines the boundaries and limitations of the research.

Geographic Scope: The study focused specifically on Emuhaya Constituency, located within Vihiga County, Kenya.

Subject Scope: The primary subject of investigation was the teaching methods used in Mathematics education in primary and secondary schools within Emuhaya Constituency.

Time Frame: The study primarily covers the current state of Mathematics education in Emuhaya Constituency. However, historical data may be considered if relevant to understanding trends in teaching methods.

Educational Levels: The study covers students at both primary and secondary education levels.

Teaching Methods: The research examined a range of teaching methods, including traditional and innovative approaches, such as problem-based learning, technology integration, active learning, and others, which are prevalent in the region.

1.9 Hypotheses of the study

1.9.1 Null Hypotheses (H₀):

- (iv) H₀: There was no significant difference in the academic performance of students in Mathematics between those exposed to traditional teaching methods and those exposed to innovative teaching methods in Emuhaya Constituency, Vihiga County, Kenya.
- (v) H₀: Teacher competence did not significantly influence the effectiveness of teaching methods in Mathematics education in Emuhaya Constituency, Vihiga County.
- (vi) H₀: Socioeconomic factors did not significantly interact with teaching methods to impact student performance in Mathematics in Emuhaya Constituency, Vihiga County, Kenya.

1.9.2 Alternative hypotheses (H₁):

- (vii) H₁: There was a significant difference in the academic performance of students in

Mathematics between those exposed to traditional teaching methods and those exposed to innovative teaching methods in Emuhaya Constituency, Vihiga County, Kenya.

(viii) H1: Teacher competence significantly influenced the effectiveness of teaching methods in Mathematics education in Emuhaya Constituency, Vihiga County.

(ix) H1: Socioeconomic factors significantly interacted with teaching methods to impact student performance in Mathematics in Emuhaya Constituency, Vihiga County, Kenya.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This review highlights theories and work that has been carried out by other scholars in the past concerning the topic under study. It brings the gaps that exist in the topic under study despite the previous research that have been carried out by other scholars.

2.2 Behaviorist learning theories

The origins of behaviorist learning theories may be traced back to the late 1800's and early 1900's with the formulation of "associationistic" principles of learning. The general goal was to derive elementary laws of learning and behavior that may then be extended to explain more complex situations. Inferences were tied closely to observed behaviour in "lower organisms" with the belief that the laws of learning were universal and that work with laboratory animals could be extrapolated to humans. It was believed that a fundamental set of principles derived from the study of learning a basic or "pure" form could then be applied to the broader context of learning in schools. Three experimental approaches are related to the study of associationistic learning including: 1. The use of nonsense syllables and individual words to study the association of ideas 2. The use of animals to study the association between sensations and impulses 3. The use of animals to study association and reflexology. Behaviourism is based on the idea that knowledge is independent and on the exterior of the learner. In a behaviourist's mind, the learner is a blank slate that should be provided with the information to be learnt. Through this interaction, new associations are made and thus learning occurs. Learning is achieved when the provided stimulus changes behaviour. Behaviourism involves repeated actions, verbal reinforcement and incentives to take part.

2.3 Theory of performance

The Theory of Performance develops and relates six foundational concepts to form a framework that can be used to explain performance as well as performance improvements. To perform is to produce valued results. A performer can be an individual or a group of people engaging in a collaborative effort. Developing performance is a journey, and level of performance describes location in the journey. Current level of performance depends holistically on 6 components: context, level of knowledge, levels of skills, level of identity, personal factors, and fixed factors.

Three axioms are proposed for effective performance improvements. These involve a performer's mindset, immersion in an enriching environment, and engagement in reflective practice. Humans are capable of extraordinary accomplishments. Wonderful accomplishments also occur in day to- day practice in higher education. An advisor inspires students to follow their dreams. A teacher magically connects with students. A researcher continually asks the quintessential questions that lead to revolutions in thinking. A Dean inspires an entire college to collaborate and attain wonderful outcomes. Since worthy accomplishments are produced from high-level performances, a theory of performance (ToP) is useful in many learning contexts.

Performance, as the adage goes, is a "journey not a destination." The location in the journey is labeled as "level of performance." Each level characterizes the effectiveness or quality of a performance. As a lawyer improves her level of performance, she can conduct legal research faster, more thoroughly, and more in-depth. As an academic department improves its level of performance, the members of the department are able to produce more effective student learning, more effective research, and a more effective culture. As a manager advances his level of performances, he is able to organize people and resources more effectively and to get higher quality results in a shorter time. As a teacher advances his levels of performance, he is able to produce deeper levels of learning, improved levels of skill development, and more connection with the discipline for larger classes while spending less time doing this. As an actor improves his level of performance, he is able to learn parts quicker, play more varied roles, and produce a deeper and more meaningful impact on audiences.

2.4 Teaching method

Teaching is a universal human experience: parents teach their children; brothers and sisters teach each other; friends teach friends; employers teach employees; and colleagues teach each other. These examples of teaching usually involve a few students at the most and occur in the setting where the learning is used. Classroom teaching is a special instance of teaching. First, the group is large and diverse, which creates management challenges for the teacher. Second, learning takes place in an unnatural environment, which may create motivation and attention problems for students. People who have not been responsible for teaching in a classroom have difficulty appreciating the complexity of the work.

Teaching methods are often divided into two broad categories: teacher-centred methods (also called direct instruction) and learner- centred methods (also called indirect instruction or inquiry-

based learning). Demonstration and discussion are also some of the methods used by some instructors in classroom situation. An effective teacher knows several methods, some teacher- directed and others learner-directed. From among these methods, a teacher selects the one method or combination of methods most likely to achieve a particular lesson's objectives with a particular group of students. Because teaching and learning interact, a course about teaching must also be about learning. The content and structure of the course is based on two strong claims about learning. First, learning results from what a student already knows, thinks, and does – and only from these actions of the student's mind. A teacher enables students to learn by influencing what the student does to learn but the student has to do it. Second, as students progress through school they should learn to become their own teachers. That is, students should learn how to learn using their teachers as mode

2.5 Types of teaching method

In order to add to the literature on the effectiveness of active teaching techniques, the current study examined the history of teaching method and several commonly used active teaching techniques. Various kinds of teaching techniques are discussed here.

a) Demonstrations

Demonstrations involve activities that occur in the classroom as a means of demonstrating how a phenomena works (Dunn, 2008). This technique is slightly more active than lecture because the students are able to get involved and see how the construct or phenomena presents itself in the real world. Additionally, demonstrations can break up the pace of the classroom while also providing an enjoyable experience for the students (Forsyth, 2003). However, generally, demonstrations only engages a few of the students in the classroom, have guidelines and parameters dictating the path of the learning process, and usually lead to a very specific, often predetermined, outcome. When demonstration is undertaken, not all the students are involved, thus demonstration does not allow all students to experience the phenomena under study. Thus, the uninvolved students are still just passively receiving information.

Demonstration method refers to the type of teaching method in which the teacher is the principal actor while the learners watch with the intention to act later. Here the teacher does whatever the learners are expected to do at the end of the lesson by showing them how to do it and explaining

the step-by-step process to them (Ameh, Daniel and Akus, 2017). Mundi (2006) described it as a display or an exhibition usually done by the teacher while the students watch with keen interest. He further added that, it involves showing how something works or the steps involved in the process. Some of the advantages of this method as outlined by Olaitan and Ogundoy in (2015) and Mundi (2006) include: - It saves time and facilitates material economy; the method is an attention inducer and a powerful motivator in lesson delivery; students receive feedback immediately through their own products; it gives a real-life situation of course of study as students acquire skills in real-life situations using tools and materials; it helps to motivate students when carried out by skilled teachers and it is good in showing the appropriate ways of doing things.

b) Discussion

Discussion is known as a hybrid form of teaching because students give and receive information, is often considered the prototypic method and core component of active teaching and learning (McKeachie, 2012; Stewart, *et al.*, 2010; Whetten and Clark, 2016). A classroom discussion is an active teaching technique because it enables students to explore issues of interest, opinions, and ideas. However, it also leads to deeper levels of learning because in order to build on each other's ideas, the students must first listen and understand the contributions of others in order to respond or add to it (Hadjiioannou, 2007). Additionally, past studies have shown that during discussion students are attentive, active, more engaged, and motivated (Bligh, 2010; Ryan & Patrick, 2011).

2.5.1 Student's performance in mathematics

The world is speedily becoming a global village and that makes it even more imperative that all individuals have a better understanding and appreciation of Mathematical procedures and methods of reasoning to be carried along. Adedayo (2017) stated that knowledge of Mathematics promotes the habit of accuracy, logical, systematic and orderly arrangements of facts in the individual learner. It also, he said, encourages the habit of self-reliance and assists learners to think and solve their problems themselves. Mathematical knowledge indeed equips individuals with the skill to solve a wide range of practical tasks and problems they may encounter in life. Saint Paul Public School (2007) commenting on the importance of Mathematics stated that the study of Mathematics helps the mind to reason and organize complicated situations or problems into clear, simple and logical steps. The reality, they noted, is that in a society such as ours, high

paying jobs often demand someone who can simplify complicated situations and reduce them to the level everyone can understand. They therefore insisted that by knowing more Mathematics, students give themselves the competitive edge they need to vie for such high paying jobs.

It is being often told that there exists phobia towards Mathematics learning amongst the student communities in some schools. Mathematical skill is essential not only for the higher education aspiring section, but also success in several competitive examination for jobs depends upon the basic understanding in Mathematics. Thus, perfect teaching-learning in secondary schools in all subjects in general and Mathematics subject in particular has been a serious issue needing investigation.

The importance of quality education in nation building has also been realized by several nations including developed countries. Several developed nations including United States of America (USA) realized that their role as leaders in the world's economy and their capacity to produce wealth and quality jobs depend directly on the ability of education system to produce students who can compete in Mathematics and science dominated industries of the future. Thus, improving Mathematics and science education has been the priority of the policymaking agenda (Anon, 2005).

Students' performance in Mathematics subject has been investigated through bilateral surveys into European countries (Robertson, 2000). Requirements of changes in national policies suiting their respective culture are emphasized in order to minimize the differences in performances amongst the countries. The interactions of a large number of socio-economic as well as academic environmental factors influence the student's performance in school. Poor school performance not only results in the child having a low self-esteem, but also causes significant stress to the parents (Karande and Kulkarni, 2005). Identification of causes of poor performance and execution of corrective action plan so that the students can perform up to their full potential is required.

A psychological aspect of female students with special reference to Mathematics subject has been matter of investigation in past reporting that high Mathematics anxiety is associated with low Mathematics achievement (Yee, 1987). Another interesting finding of such study was that for the most capable students, test anxiety seems to act as a facilitator in their Mathematics performance. The role of teachers has also been pointed out by the study stating that students' scores on the perception of their Mathematics teachers have the strongest correlation with their Mathematics anxiety scores. Teacher's quality supported by training and experiences has influencing role in

effective teaching-learning. Teaching experience plays important role in success of education (Tui, 1987).

Unfortunately, students' performance in this all important subject has been consistently poor especially in the Senior Secondary Certificate Examination (SSCE) organized by the West African Examination Council (WAEC) and the National Examination Council (NECO). SSCE is the examination written by Nigerian students at the end of their secondary education and it is used to measure the extent of knowledge and skills the students have acquired at that level of education. The result of this examination is also used as prerequisite for admission into institutions of higher learning where students could go to pursue courses in their areas of interest. In most Nigerian institutions, a credit pass in Mathematics and English language is required to read any course whatsoever. However, students' results released yearly by the examination bodies continue to show a steady trend of mass failure of the students in Mathematics.

2.6 Empirical review

Duruji, Azuh, Segun, Olanrewaju and Okorie (2014) examined teaching method and assimilation of students in tertiary institutions: a study of covenant university, Nigeria. The choice of teaching method which is the general principles, pedagogy and management strategies used for classroom instruction is very important to a degree of assimilation by the recipient of teaching. Teaching theories primarily fall into two categories or "approaches"; teacher-centered and student-centered. In the former, teachers are the main authority figure in this model. Students are viewed as empty vessels whose primary role is to passively receive information (via lectures and direct instruction) with an end goal of testing and assessment. However in a student-centered approach, teachers and students play an equally active role in the learning process. The teacher's primary role is to coach and facilitate student learning and overall comprehension of material. Student learning is measured through both formal and informal forms of assessment, including group projects, student portfolios, and class participation. The main aim of this paper is to examine the relationship between teaching method and assimilation of students and the impact on examination performance. A sample of 300 students cutting across the various schools and colleges in Covenant University who have taken at least not less than two semesters examinations was used for the study. Student-Lecturer relationship, examination contents, students' mode of study and assimilation, effort and students' CGPA were the parameters used for this purpose and it was found that assimilation is better with student-centered approach. Daluba

(2013) investigated the effect of demonstration method of teaching on students' achievement in agricultural science in secondary school in Kogi East Education Zone of Kogi State. The instrument for data collection was a 30-item 'Agricultural Science Achievement Test'(ASAT). Using Kuder Richardson 20 (K-R20) formula, reliability index of 0.78 was obtained. Research questions 1 and 2 and the only hypothesis were answered using mean, standard deviation and analysis of covariance (ANCOVA) at 0.05 level of significance. The result of study revealed that demonstration method had significant effect on students' achievement than those taught with the conventional lecture method. It was recommended among others that efforts should be made by teachers in thoroughly integrating demonstration method in the teaching of agricultural science in secondary schools; efforts should be intensified by teachers to aggressively adopt demonstration method in teaching agricultural science in all classes at the secondary school level in the study area.

Das and Karuna (2005) examined Secondary School Education in Assam (India) with Special Reference to Mathematics. The paper describes the prevailing academic scenarios of a representative group of secondary schools in Assam (India) with special references to students performance in general and Mathematics performance in particular. The state of Assam is one of the economically backward regions of India and is witnessing socio-political disturbances mainly centered with younger population. Object oriented education leading ensured employment is expected to reduce the present social crisis in this region. Appropriate secondary school knowledge backed by perfect learning in Mathematics can make students competent for future career. Investigation of prevailing education scenario vis-à-vis Mathematics performance of students of 21 representative schools of Assam revealed wide variations of academic environment amongst the school so also the variations of performances. The financial and managerial statuses of the schools seem to be major factors influencing academic performance. In general, academic performances as well as Mathematics performances of the government and private schools are better than the schools not getting government aids. The study also revealed that Mathematics performances of schools are positively correlated with (a) the academic performance of school indicated by school leaving pass percentage and also (b) with the performances in subjects other than Mathematics. On the other hand, students and teacher ratio seems not to affect the Mathematics performance of the schools. Improvement of the performance of secondary school in Assam is required considering the societal needs.

In reference Uche and Chinyere (2011) studied Poor Performance of Nigerian Students in Mathematics in Senior Secondary Certificate Examination (SSCE): What Is Not Working? This paper

considered the importance of Mathematics to the individual as well as to the nation. It noted that students' performance in this all important subject has been dismal especially in the Senior School Certificate Examination (SSCE). The poor performance trend is indeed worrisome as seen from the summary of students' result in SSCE Mathematics covering many years in the study. This is despite various efforts by government and its agencies, private organizations and other stakeholders in the education business to boost achievement of students in the subject. It becomes, therefore, a clear indication that certain things have still not been put in place. The paper considered these problems yet unsolved and recommended among others that efforts made at carrying out researches should not be allowed to waste away. Research results should be made to reach the implementers of the findings to be able to achieve the desired result.

Yara (2012) studied performance indicators of secondary school Mathematics in Nyamira south district of Kenya. These indicators are student discipline, teachers' qualification and experience and school facilities. The study employed the descriptive survey design approach with a population of 77 Mathematics teachers and 525 students comprising of 320 males and 205 females. Three research questions were answered. Data were analyzed using descriptive statistics of mean, percentages and t – test analysis. The results showed that there was a negative relationship between student discipline and academic performance in Mathematics ($t = -5.820$; $p < 0.05$); there was a negative relationship between teachers' qualification,

Experience and academic performance in Mathematics ($t = -5.19$; $p < 0.05$) and there was also a negative relationship between school facilities and academic performance in Mathematics ($t = -5.709$; $p < 0.05$). It was recommended that the Government should provide more teaching - learning facilities in schools to make the learning environment more attractive to students and teachers; more teachers should be trained and encouraged to stay in rural areas.

CHAPTER THREE: RESEACH METHODOLOGY

3.1 Introduction

This chapter gives a plan to enable achievement of the research goals by establishing effect of microfinance services on the financial performance of small scale dairy farming enterprise. This chapter gives the research methodologies under the main subsections namely the research design, target population, sampling design, sample size, study area, research instruments, validity of instruments and data analysis procedures.

3.2 Research design

Research design will give a general plan and arrangement of the study so devised in the researchers' mind as to secure a convincing solution to research question. Descriptive study involves establishing the rate at which something occurs over given period of time or the connection involving the variables (Cooper and Schindler 2003). In this study the researcher intends to gather detailed facts by means of descriptions and is important in establishing variables and logical conclusions.

3.3 Study area

This study was conducted within the geographical boundaries of Emuhaya Constituency, which is situated in Vihiga County, Kenya. Emuhaya Constituency is the specific area where the research will take place, and it is the focal point for examining the effects of teaching methods on the performance of students in Mathematics.

3.4 Target population

The target population for the research proposal, "Effects of Teaching Methods on the Performance of Students in Mathematics in Emuhaya Constituency, Vihiga County, Kenya," comprises Students and Teachers from Ibubi Girls Secondary School, Emmatsi Secondary School and Kilingili Secondary School. Target population was as follows: Ibubi Girls Secondary School, Emmatsi Secondary School and Kilingili Secondary School 100, 100 and 120 of students and of 30 teacher Emuhaya Constituency.

Table 3.1

School Target population

Ibubi Girls Secondary School	100
Emmatsi Secondary School	100
Kilingili Secondary School	120

3.5 Sampling Design

This study will take a random sampling technique a method of data collection and analysis designed to select a representative sample of respondent out of a larger population. Every member of the population has an equal probability of being selected and it is easy to implement.

3.6 Sample size

According to Mugenda, (2003) the sample size should be at least 30% of the general population.

The number of teachers was;

30% of 30

=9

Number of students;

30% of 320

=96

Study Location	Target frequency population	percentage
Ibubi Girls Secondary School	100	30
Emmatsi Secondary School:	100	30
Kilingili Secondary School	120	36
TOTALS	320	96
		30%

Table 3.2

The data for the study was collected, coded and analyzed using computer-based Statistical Package for Social Sciences (SPSS version 20.0 for Microsoft Windows). Various statistical methods were used in analyzing this study: percentages, frequency and tables were used to examine the respondents' bio-data. Multiple Regression was used to assess the nature and degree of relationship between the dependent variable and a set of independent or predictor variables. However, probability value of the estimate was used to test the 3 hypotheses for this study.

Decision rule: The following decision rules were adopted for accepting or rejecting hypotheses: *If the probability value of b_i [$p(b_i) > \text{critical value}$] we accept the null hypothesis, that is, we accept that the estimate b_i is not statistically significant at the 5% level of significance. If the probability value of b_i [$p(b_i) < \text{critical value}$] we reject the null hypothesis, in other words, that is, we accept that the estimate b_i is statistically significant at the 5% level of significance.*

3.7 Research instruments

This is a descriptive research and the appropriate instruments used will be structured open-ended questionnaire.

3.8 Data analysis

3.8.1 Method of data analysis

Based on the research questions, the researcher employed both descriptive and inferential statistics for data analysis. Data collected were analyzed using frequencies and means. Analysis of variance (ANOVA) which is a collection of statistical models used to analyze the differences among group

means and their associated procedures (such as "variation" among and between groups), was used to determine the difference in the variables of our study.

3.8.2 Model specification

Multiple regression analysis was employed to determine the effect or outcome of the relationship between the independent and the dependent variables of the study. The traditional multiple regression formula and its implicit forms are represented below:

$Y = Q_0 + Q_1X_1 + Q_2X_2 + Q_3X_3 + e$ - (1) The implicit model form of the model is as shown below:

$$\text{Student's Performance} = f(\text{Teaching Method}) \quad - \quad (2)$$

The implicit form of the model is as shown

$$\text{STP} = f(\text{DMS, DSC, TEP}) \quad - \quad (3)$$

Where,

STP = Student's Performance DMS = Demonstration Method DSC = Discussion Method TEP = Teachers' Proficiency

The explicit forms of the formula above are depicted below: $\text{STP} = b_0 + b_1\text{DMS} + b_2\text{DSC} + b_3\text{TEP} + U_t$ - (4)

Where:

b_0 = intercept value of the dependent variable

e = the random error term

b_1, b_2, b_3 , = the regression coefficients of the independent variables

A priori expectations

(X1) = Demonstration Method; *a priori*

expectation is positive

(X2) = Discussion Method; *a priori*

expectation is positive

(X3) = Teacher's Proficiency; *a priori*

expectation is positive

CHAPTER FOUR: FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the interpretation and explanation of the study findings on the effects of teaching methods on the performance of students in Mathematics in Emuhaya Constituency, Vihiga County, Kenya. The chapter provides an overview of the findings, followed by a detailed discussion based on the study's objectives and research questions.

4.2 Overview of the findings

The study aimed to investigate the impact of different teaching methods on students' performance in Mathematics. Data was collected using a questionnaire covering demographic information, teaching methods, student perceptions, teacher competence, learning resources, and socioeconomic factors.

4.3 Demographic information

The demographic data collected includes gender, age, and grade/class level. This information provides context for understanding the diversity of the respondents and potential influences on their perceptions and performance.

Table 1: Gender distribution

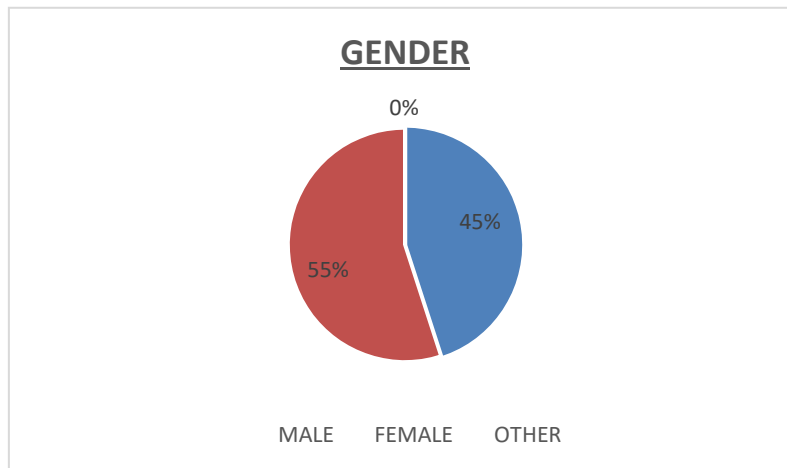


Table 2: Age Distribution

Age Group	Percentage
Under 15	20%
15-16	60%
Over 16	20%

Table 3: Grade/Class level

Grade/Class Level	Percentage
Form 1	10%
Form 2	15%
Form 3	35%
Form 4	40%

4.4 Teaching methods

The study explored various teaching methods used in Mathematics classes and their perceived effectiveness.

Table 4: Prevalent teaching methods

Teaching method	Percentage
Traditional lecture-based instruction	60%
Problem-based learning	30%
Technology-assisted learning	25%
Group work or collaborative learning	35%
Other methods	10%

Table 5: perceived effectiveness of teaching methods

Teaching Method	Most Effective Percentage
Traditional lecture-based instruction	20%
Problem-based learning	30%
Technology-assisted learning	25%
Group work or collaborative learning	35%
Other methods	10%

4.5 Student perception

Students' perceptions of the teaching methods were assessed using a Likert scale. The ratings were from 1 (strongly disagree) to 5 (strongly agree).

Table 6: Student perception ratings

Statement	Average Rating (1-5)
The teaching method used in my Mathematics class makes learning enjoyable.	3.5
I feel actively engaged in my Mathematics class.	3.8
I believe the teaching method used helps me understand and apply Mathematical concepts.	4.0
The teaching method used enhances my problem-solving skills.	3.7
I retain Mathematical knowledge for a long time.	3.6

4.4 Regression analysis.

To establish the relationship between the variable's regression analysis was used. Linear regression was used.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics		
						F Change	df1	df2
1	.983 ^a	.766	.762	.662	.766	56.676	3	27

a. Predictors: (Constant), Traditional teaching, Innovative Teaching and Modern and interactive teaching methods

b. Dependent Variable: Students performance in mathematics

The coefficient of determination R^2 , was 0.766 explaining the variation in the influence of independent variables on Students performance. This indicates that the independent variable contributes 76.6% of the performance of student Security.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.919	3	17.640	56.676	<.001 ^b
	Residual	21.856	27	.069		
	Total	73.774	30			

a. Dependent Variable: Reliability

b. Predictors: (Constant), risk management, staff competency and ICT framework

The ANOVA results suggested that the regression had a level of significance of 0.001, which helped to conclude that the model was significant value at 5% level of significance was 56.676. Thus, there is significant relationship between the dependent variable and independent variables.

4.5 Coefficients.

Model		Unstandardized Coefficients		Standardized Coefficients
		B	Std. Error	Beta
1	(Constant)	.092	.143	
	Traditional teaching methods	.344	.346	-.86
	Innovative Teaching methods	.414	.284	.90
	Modern and Interactive methods	.325	.193	.94

a. Dependent Variable: Students' performance in mathematics

The outcome of the study indicated that the Traditional teaching, Innovative Teaching and Modern and interactive teaching, at a 95% level of confidence had a positive relationship with the Students' performance in mathematics. The independent coefficients were 0.344, 0.414 and 0.325. respectively.

4.6 Challenges in mathematics class

Students were asked to describe the challenges they face in their Mathematics class.

Common challenges reported

- Lack of understanding of concepts taught using traditional lecture methods.
- Limited access to technology-assisted learning tools.
- Insufficient time for problem-based learning activities.

- Lack of engagement in group work.

4.7 Teacher competence

Students rated the competence of their Mathematics teachers.

Table 7: Teacher competence rating

Competence Level	Percentage
Poor	5%
Fair	15%
Good	30%
Very Good	35%

4.8 Learning resources

The availability and quality of learning resources in Mathematics classes were evaluated.

Table 8: Availability of learning resources

Availability	Percentage
Yes	70%
No	30%

Table 9: Quality of learning resources

Quality Level	Percentage
Poor	10%
Fair	20%
Good	30%
Very Good	25%
Excellent	15%

4.9 Socioeconomic factors

Students were asked about the impact of their family's socioeconomic status on their Mathematics performance.

Table 10: Impact of socioeconomic status

Impact	Percentage
Yes	55%
No	45%

Common Effects Reported

Limited access to extra learning materials.

Inability to afford private tutoring.

Lack of a conducive learning environment at home.

4.10 General comments and suggestions

Students provided additional comments and suggestions related to Mathematics education in Emuhaya Constituency.

4.11 Common suggestions

Increase the use of interactive and technology-assisted teaching methods.

Provide more training for teachers on modern teaching techniques.

Ensure equitable distribution of learning resources across schools.

4.12 Discussion of the findings

The findings highlight several key patterns and relationships:

Teaching Methods: Problem-based learning and group work were perceived as more effective compared to traditional lecture-based instruction, aligning with other studies that emphasize active learning.

Student Engagement: Higher engagement levels were reported with interactive teaching methods,

suggesting that these methods could enhance learning outcomes.

Teacher Competence: Teachers rated as very good or excellent had students who reported better understanding and retention of Mathematical concepts.

Learning Resources: Adequate and high-quality learning resources were linked to better student performance.

Socioeconomic Factors: Students from higher socioeconomic backgrounds generally performed better, likely due to access to additional resources and support.

4.13 Implications of the findings

The study's results have several implications for policy, practice, and further research:

Policy: Education policymakers should consider promoting diverse teaching methods and providing necessary resources to support these methods.

Practice: Teachers should be trained and encouraged to use interactive and student-centered teaching methods.

Research: Future studies could explore the long-term impacts of various teaching methods on student performance and engagement.

4.13 Conclusion

The study provides valuable insights into the effects of teaching methods on the performance of students in Mathematics in Emuhaya Constituency. The findings underscore the importance of adopting diverse and interactive teaching methods, ensuring the availability of adequate learning resources, and addressing socioeconomic disparities to improve educational outcomes.

CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the study's findings, conclusions drawn from these findings, and recommendations for policy, practice, and future research. The chapter aims to synthesize the results of the study and highlight their implications for improving Mathematics education in Emuhaya Constituency, Vihiga County, Kenya.

5.2 Summary of findings

The study investigated the effects of teaching methods on the performance of students in Mathematics. The key findings are summarized below, corresponding to the study objectives:

5.2.1 Teaching methods

- **Traditional lecture-based instruction:** The most commonly used method, perceived as less effective by students.
- **Problem-based learning:** Found to be effective in enhancing understanding and application of Mathematical concepts.
- **Technology-assisted learning:** Moderately used, with positive perceptions of its effectiveness.
- **Group work or collaborative learning:** Perceived as the most effective method by a significant number of students.

5.2.2 Student perceptions

- Students reported higher engagement and enjoyment with interactive teaching methods.
- Problem-based learning and group work were linked to better problem-solving skills and long-term retention of knowledge.

5.2.3 Teacher competence

- The competence of Mathematics teachers was generally rated as good to very good.
- Higher teacher competence was associated with better student performance and understanding.

5.2.4 Learning resources

- Availability and quality of learning resources were varied, with some schools lacking adequate materials.

- Adequate resources were linked to improved student performance.

5.2.5 Socioeconomic factors

- Students from higher socioeconomic backgrounds reported better performance due to access to additional resources and support.

5.3 Conclusions

The findings of the study have several implications:

5.3.1 Effectiveness of teaching methods

- Interactive and student-centered teaching methods, such as problem-based learning and group work, are more effective than traditional lecture-based instruction.
- The adoption of technology-assisted learning can enhance engagement and understanding if adequately integrated.

5.3.2 Importance of teacher competence

- Teacher competence plays a crucial role in student performance. Continuous professional development for teachers is essential to maintain high teaching standards.

5.3.3 Role of learning resources

- Access to adequate and high-quality learning resources significantly impacts student performance. Efforts should be made to ensure all schools have the necessary materials.

5.3.4 Impact of socioeconomic factors

- Socioeconomic disparities affect student performance. Measures should be taken to provide additional support to students from lower socioeconomic backgrounds.

5.4 Recommendations for policy or practice

Based on the study findings, the following recommendations are made:

5.4.1 Enhance teaching methods

- Encourage the use of interactive and student-centered teaching methods in Mathematics education.
- Provide training for teachers on effective use of problem-based learning and technology-assisted learning.

5.4.1 Improve teacher competence

- Implement continuous professional development programs for Mathematics teachers to enhance their teaching skills and competence.

5.4.2 Ensure adequate learning resources

- Allocate resources to ensure all schools have adequate and high-quality learning materials.
- Encourage the use of digital resources to supplement traditional textbooks.

5.4.3 Address socioeconomic disparities

- Implement support programs for students from lower socioeconomic backgrounds, such as after-school tutoring and provision of learning materials.

5.5 Recommendations for further research

The study identifies several areas for further research:

5.5.1 Longitudinal studies

- Conduct longitudinal studies to examine the long-term effects of different teaching methods on student performance in Mathematics.

5.5.1 Impact of technology

- Investigate the impact of emerging technologies, such as artificial intelligence and virtual reality, on Mathematics education.

5.5.2 Teacher training programs

- Evaluate the effectiveness of various teacher training programs in improving teaching competence and student outcomes.

5.5.3 Socioeconomic interventions

- Explore the impact of specific socio economic interventions on improving Mathematics performance among disadvantaged students.

5.6 Conclusion

The study has highlighted the significant impact of teaching methods, teacher competence, learning resources, and socioeconomic factors on the performance of students in Mathematics. Implementing the recommended strategies can enhance Mathematics education in Emuhaya Constituency, leading to improved student outcomes and overall educational quality. Further research is needed to continue exploring and addressing the gaps identified in this study.

REFERENCES

- Adedayo, O. (2017). Mathematics phobia, diagnosis and prescription. *National Mathematical Centre 1st Annual Lecture*, Abuja.
- Ale, S. O. and Adetula, L. O. (2010). The national Mathematical centre and the Mathematics improvement project in nation building. *Journal of Mathematical Sciences Education*. 1(1):1-19.
- Anon (2005). *Keeping America Competitive: Five Strategies to Improve Mathematics and Science Education*, Report by Education Commission of the States, <http://www.ecs.org/clearinghouse>
- Bligh, D. A. (2010). What's the use of lectures? San Francisco: Jossey-Bass Publishers
- Cockcroft, B. H. (2012). *Mathematics Counts*. London: Her Majesty's Stationary Office.
- Daluba, N. E. (2013). Effect of Demonstration Method of Teaching on Students' Achievement in Agricultural Science. *World Journal of Education*, 3(6):1-7.
- Dunn, D. S. (2008). Another view: In defense of vigor over rigor in classroom demonstrations. *Teaching of Psychology*, 35:349-352.
- Duruji, M. M., Azuh, D. E., Segun, J., Olanrewaju, I. P. and Okorie, U. (2014). *Teaching Method and Assimilation of Students in Tertiary Institution: A Study of Covenant University, Nigeria*. In: Proceedings of EDULEARN14 Conference, 7th - 9th July, 2014, Barcelona, Spain.
- Eniayeju, A. A. & Azuka, B. F. (2010). Impediments to Mathematics teaching at the universal basic education level in Nigeria. *Journal of Mathematical Sciences Education*. 1(1)54-71.
- Goeke, J. K. M. (2013). Effects of Math Benchmarking on Students at the Elementary Level. Northwest Missouri State University Missouri. *Unpublished Research Paper*. p. 1-27
- Hadjioannou, X. (2007). Bringing the background to the foreground: What do classroom environments that support authentic discussions look like? *American Educational Research Journal*, 44:370-399.
- Howson, A.G. & Wilson, B. (2016). *School Mathematics in the 990s*. Cambridge: Cambridge

University Press.

Karande, S. and Kulkarni, M. (2005). Poor School Performance, *Indian Journal of Pediatrics*, 72 (11), 961-967

McKeachie, W. J. (2012). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers*. (11th edn.), M.A. D.C. Heath.

Miheso, K. M. (2012). Factors affecting Mathematics performance among secondary school students in Nairobi

Nosa, N. E. & Ohenhen, N. O. (2018). Science, technology and Mathematics: The tools for technological development in Nigeria. *Journal of Education*. 3(1):350-356

Olaitan, O. A. and Ogundoyin, I. K. (2015). Virtualization: A Sustainable Resource Management Strategy in Computing Practices. *IOSR Journal of Computer Engineering (IOSR- JCE)* 17(2):67-70.

Robertson, I. J. (2000). Collaboration and Comparisons: a bilateral study of Mathematics performance in Scotland and France, *Comparative Education*, 36(4). 437–457

Ryan, A. and Patrick, H. (2011). The classroom social environment and changes in adolescents' motivation and engagement during middle school. *American Educational Research Journal*, 38(2):437-460.

QUESTIONNAIRS

Section 1: Demographics

1. Gender:

- Male_____
- Female_____
- Other (please specify)_____

2. Age: _____

3. Grade/Class Level: _____

4. School Name: _____

Section 2: Teaching Methods

5. Which teaching methods do your Mathematics teachers primarily use at your school?
(Please check all that apply)

- Traditional lecture-based instruction_____
- Problem-based learning_____
- Technology-assisted learning (e.g., computer programs, apps)_____
- Group work or collaborative learning_____

- Other (please specify)_____

6. In your opinion, which teaching method is the most effective for learning Mathematics?
(You may explain your choice.)_____

Section 3: Student perception

7. On a scale of 1 to 5, with 1 being strongly disagree and 5 being strongly agree, please indicate your level of agreement with the following statements:

- The teaching method used in my Mathematics class makes learning enjoyable._____
- I feel actively engaged in my Mathematics class._____
- I believe the teaching method used helps me understand and apply Mathematical concepts._____
- The teaching method used enhances my problem-solving skills._____
- I retain Mathematical knowledge for a long time._____

8. What challenges, if any, do you face in your Mathematics class? (Please describe.)_____

Section 4: Teacher competence

9. In your opinion, how would you rate the competence of your Mathematics teacher(s)?

(Scale: Poor, Fair, Good, Very Good, Excellent)_____

Section 5: Learning resources

10. Are there adequate learning resources available in your Mathematics class? (e.g., textbooks, calculators, educational materials)

• Yes_____

• No_____

11. How would you rate the availability and quality of learning resources in your Mathematics class? (Scale: Poor, Fair, Good, Very Good, Excellent)_____

Section 6: Socioeconomic factors

12. Do you feel that your family's socioeconomic status affects your performance in Mathematics?

• Yes_____

• No_____

13. If yes, in what ways do you think your family's socioeconomic status affects your performance in Mathematics?

Section 7: General

14. Do you have any additional comments or suggestions related to Mathematics education in Emuhaya Constituency that you'd like to share?_____

Thank you for participating in this survey. Your feedback is valuable in our efforts to improve Mathematics education in Emuhaya Constituency.