

**SCHOOL LEVIES AND ACADEMIC ACHIEVEMENT IN PUBLIC DAY  
PRIMARY SCHOOLS IN NYAMIRA COUNTY, KENYA**

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A Thesis Submitted in Partial Fulfillment for the Requirements of the Award of the  
Degree of Doctor of Philosophy in Educational Planning and Management of  
Masinde Muliro University of Science and Technology

JUNE, 2024

**DECLARATION BY STUDENT**

This research thesis is my original work prepared with no other than the indicated sources and support and has never been presented anywhere for the award of a degree or any other award in a university or any other institution of higher learning.

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## **DEDICATION**

This PhD research thesis is dedicated to the creator, the almighty God who has enabled me to have good health and great insights into writing it at the time He chose.

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## ABSTRACT

Primary education is the foundation for literacy and the acquisition of basic skills, social attitudes and values that make life important in society. Although some studies have shown that facilities, teaching/learning resources and teacher ratios are contributing factors for educational performances in public primary schools, the effect of school levies on academic achievement in public day primary schools remains unclear. The purpose for this research study was primarily designed to examine effect of school levies on academic achievement in primary schools in Nyamira County, Kenya. The study had four specific research objectives: to establish effect of school motivational levies on academic achievement, to establish effect of remedial levies on academic achievement, to determine effect of examination levies on academic achievement and to determine effect of the cost of revision materials on academic achievement in public day primary schools in Nyamira County Kenya. The study was informed by the Education Production Function theory. Given that data was collected to test a hypothesis, an ex – post facto research design was used in data collection. The sample size of 198 public day primary schools was drawn from public day primary schools in Nyamira County to participate in the study. Stratified random sampling and simple random sampling techniques were used to select the sample and respondents. Questionnaires and documentary analysis guide were used to collect data. Pilot study was done to pre – test the instruments and content validity was determined. Data collection tools were validated by seeking the two supervisors' opinion on the clarity of items. Reliability was ensured through a test-retest method and Cronbachs alpha coefficient with index of 0.70 was obtained. Data collected from the questionnaires were analyzed by using descriptive statistics (mean, frequencies and percentages) and inferential statistics using Pearson Product-Moment Correlation Coefficient and Multiple Linear Regression. Descriptive statistical analysis was done to describe the basic characteristics of the data. The hypothesis of study was tested at 0.05 significance level. The findings of multiple linear regression suggest that pupil's motivation levies ( $b=0.0037$ ,  $t=2.75$ ,  $p=0.007$ ), morning remedial levies ( $b=0.0007$ ,  $t=3.37$ ,  $p=0.001$ ), evening remedial levies ( $b=0.0007$ ,  $t=3.37$ ,  $p=0.001$ ), internal examinations levies ( $b=0.0024$ ,  $t=6.94$ ,  $p<0.0001$ ) and the cost of revision materials ( $b=0.0082$ ,  $t=13.53$ ,  $p<0.0001$ ) have significant effect on academic achievement in public day primary schools. The research study recommends schools should develop culture of motivating pupil's, conducting morning and evening remedial, adopt testing using internal examinations and increase spending on revision materials.

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## **ABBREVIATIONS AND ACRONYMS**

CATS	Continuous Assessment Tests
CDE	County Director of Education
CDF	Constituency Development Fund
DEB	District Education Board
DOK	Diocese of Kisii
EFA	Educational for All
EPDC	Educational Policy and Data Centre
EPF	Educational Product Function
FPE	Free Primary Education
HODs	Heads of Departments
KCPE	Kenya Certificate of Primary Education
LICS	Low Income Countries
LREB	Lake Region Economic Blueprint
MDGs	Millennium Development Goals
MoEST	Ministry of Education Science and Technology
NCST	National Council of Science and Technology
NNSSF	National Norms and Standards for School Financing
OECD	Organization for Economic Co-operation and Development
PTA	Parents Teachers Association
QUASO's	Quality Assurance and Standards Officers
SASA	South African Schools Act
SDA	Seventh-day Adventist
TSC	Teachers Service Commission
UK	United Kingdom

UN	United Nations
UNESCO	United Nation Educational, Scientific and Cultural Organization
UNICEF	United Nations
UPE	Universal Primary Education
USA	United States of America

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# **CHAPTER ONE**

## **INTRODUCTION**

### **1.0 Introduction**

Chapter one comprises thirteen main sections for this study, namely the background of the study which presents a detailed information underpinning this study, the statement of the problem which gives a relatively detailed question to be answered, the purpose of the study on the hand gives and specifies the general position of the study, the study objectives which exhibits the broad intensions, the hypotheses for the study that carries proposed solution, the justification of the study which clarifies problem and why it has been undertaken, the significance of the study which is an outline of the relevance of in general, the scope of the study which states the coverage of a particular study, the limitations for the study discusses the challenges which are beyond the researcher that were encountered, the assumptions for the study which cover a wide spectrum of propositions for which the data will be made available, the theoretical framework which encompasses theory that drives the study and study findings, the conceptual framework of the study which illustrates the connection between the independent and dependent variables in this research and the operational definitions of terms this provides definitions for the terms used in the study.

### **1.1 Background of the Study**

Educating children in world over is regarded as an investment that, in principle, people undertake with the expectation that the benefits will exceed the (upfront) costs (UNESCO, 2014). Although, public day primary schools are perceived to be offering low

quality education, the government has put in efforts to ensure accessibility and equity in employing more teachers and reducing direct costs in terms of school fees incurred by parents and caregivers in the education of their children (Obonyo et al., 2015). Equally. in order to provide education opportunities to their citizens, developing countries have had to increase their public expenditure on education, which at times exceeds the overall growth in gross national product (Nyanyuki et al., 2013). Despite the huge public expenditure on education, motivational levies, remedial levies, examination levies, and extra cost of revision materials as school levies still exists in a large number of Kenyan public day primary schools and other developing countries all over the world. According to Nioroge (2013), he posits that, parents and caregivers across the world and more so in the third world countries and countries that are developing around the world, parents have supported the primary schools financially for the purpose of attaining quality education. The financial support by parents and caregivers is either contributed as school fees, user fees, or extra school levies (Wango et al., 2012).

Globally, Moneva et al., (2020), found that students in India, were more driven to pursue their education when they had their parents' financial support. According to Moneva et al., (2020), it emerged that, from parentals' financial support students are motivated to learning which is an indication of the importance of parental financial support. Similarly, Canada, school charge some school fees which have been regarded as part and parcel of the schooling system. Parents, caregivers and together with sponsors are asked to make fees payments towards their children's education (Nyaga, 2005), as cited by Chabari (2010). Chabari (2010) argues that, the government recognizes that some parents are

sincerely not in a position to pay so the government made provisions to make it possible for such children to access education without being denied and opportunity of learning because of an honest inability to raise school fees. This is the main reason behind why the government and all stakeholders to ensure that what is in place in terms of policies that govern the payment of school fees are put in action and implemented consistently in all the provinces (Nyaga, 2005).

Many parents in England send their children to independent schools where, according to the Social Market Foundation research report, tuition fees averaged £12,582 and £28,500 in 2014 for day and boarding places respectively (Winch, 2014). It is hardly surprising that parents make this choice over free state-funded education because evidence exists in the literature in support of the notion that former students of private schools enjoy relatively higher returns from their education than their state school counterparts (Ndaji et al., 2016). According to UNICEF Innocenti Research Centre, (2012), it is reported that, a good number of learners who are above one learner in every five of all U.S. school going children live in poverty, and that percentage is substantially higher for some subgroups of the population. Internationally, the United States ranks second highest in child poverty among the world's "richest" 35 countries, surpassed only by Romania (UNICEF Innocenti Research Centre, 2012).

Education in most parts of Africa receives only 15% of total public spending on education Mwikya, (2019). It is evident according to Ugochukwu et al., (2021), that limited finance has been a major barrier in the effective operation of primary education in

Nigeria. Budgetary allocation to education in year 2021 was 6.3% while UNESCO suggests 26% of the country's annual budget (Ugochukwu et al., 2021). In South Africa, the government came up with a model of funding termed as a National Norms and Standards for School Funding (NNSSF), this model was designed to provide a legal framework to guide in funding school schools in South Africa basing on an idea of quintiles. Ideologically, the quintiles as provided by the legal framework, provided for grouping of schools into five quintiles which is anticipated to correct historic differences in education (Dibet, 2015). Quintiles 1 to 3, comprises of learning institutions which are mostly located in areas regarded as township and rural areas, are schools which do not charge any school fees. On the other hand, there exists, quintiles 4 and 5 where school fees is charged and paid by caregivers and parents. Most of this learning institutions situated in urban areas and more affluence areas (Mestry, 2016). Section 40 of the South African Schools Act (SASA) stipulates that parents in fee-paying schools are obligated to pay the fee charged by the school.

However, according to Education Policy and Data Center (2010), in Nigeria, Uganda, and Zambia, analysis of household expenditures on primary education from the Demographic and Health Survey in Educational Data surveys (2011) shows a substantial number of potential costs a family must pay toward education. While some costs, such as transportation in Nigeria, appear to be particularly high, relatively few households report paying these costs. However, other fees, such as parent-teacher association fees or textbook purchases, are smaller in value yet paid by large proportion of families. In the case of Nigeria and Uganda, these data were collected several years after school fee

abolition, suggesting that despite the elimination of tuition fees, many other costs remain (EPDC, 2010).

While studies done by Njuguna (2011), Reche et al., (2012), and Muchunku (2014), have examined factors such as inadequate learning resources, inadequate monitoring by head teachers, understaffing, high teacher turnover rate, inadequate prior preparation, lack of motivation for teachers, large workload, absenteeism by both teachers and pupils, pupil's lateness and lack of support from parents and how they affect academic achievement of pupils in KCPE exams. Little evidence exists on the relationship between school levies such as motivational, remedial, examination and cost of revision materials on pupil's academic achievement in national exams. However, numerous studies conducted by various researcher such as Adebunmi et al. (2020), Moneva et al. (2020), and Mupa et al. (2015), have shown there is an effect of school levies on academic achievement. According to Adebunmi et al., (2020) it is argued that the absence of financial support prevents the achievement of good quality education. While opinions and practice on school levies have fluctuated over the years, there is surprisingly little systematic empirical evidence regarding their relative merits.

Notably, studies such as Njoroge, 2013, Mboi et al., 2013, and Munda et al., 2014 have shown a positive correlation between parent's monetary contribution and academic achievements. This argument is further supported by a survey that was carried out by Mboi et al, (2013), where by an inquiry was conducted that explored implication of extra tuition in primary school learners, this study revealed that to a large extent the result has

shown that the link between unit cost and total performance was positive. In overall academics of learners in primary school. This implies that in every extra shilling added on the unit cost there is an increase in the mean score obtained in the final examinations. Further in this study, it is evident that the government's efforts towards providing financial subsidy to education is still inadequate and not able to cover vulnerable groups. Hence, this has created a need for schools to charge school levies so as to improve on academic output of pupils. This idea has also been advanced by Munda et al, (2014), in their study which focused on, the analysis of how various charges in education implicate students' academic performance. In this research survey Munda et al, (2014), equally asserted that there is a relationship which is positive and significant which existed between secondary school academic performance and unit cost. However, a research survey by Njoroge (2013), which underscored the importance of hidden school charges, argues that the hidden cost in education influence academic performance positively.

While school fees have been found to be a significant barrier to educational enrolments, prohibiting pupils from households with low incomes from attending school, the role of user fees in improving school attendance or completion rates has been debated (World Bank, 2009). The case for introducing user fees primarily rests upon their supporting the fiscal sustainability of infrastructure and quality investments in the education sector. According to Bhalotra et al., (2014), the argument is that, with a hard resource constraint, freely provided or massively subsidized education in developing countries will lead to poorer quality provision and restricted supply, both of which tend to disadvantage the poor more. But, a large empirical literature by Sawamura et al., (2008), Karemes, (2010),

Werunga et al., (2011) and Wekesa et al, (2015), have observed that school levies have a far-reaching negative impact on learners when parents are not able to raise the fees required. Karemesi (2010) as cited by Munda et al., (2014) observed that costs such as examination fees, salary top ups, textbooks, teaching materials, school uniforms, feeding, transportation and sports are major constraints to achieving universal basic education especially for the poor. It is on this basis that Sawamura et al., (2008) argues that many children are unable to gain access to primary education, despite the government's intervention of abolishing fees. Similarly, Werunga et al., (2011) in their study established that an average of 40% of pupils fail to transit to secondary schools every year in the district and the most affected are girls. The main reasons for non-transition are lack of funds to pay school levies, early marriages, and long distance to school and lack of interest in schooling (Werunga et al., 2011). Thus, school levies in public learning institution to some extent they have a far-reaching, negative outcomes on education provided by learning institutions and also at primary school level.

Constitution of Kenya 2010, offering basic education is a fundamental right. In particular, article 53 1(b) which gives the learners entitlement to a free schooling, thus, offering the same is a government obligation to ensure that all school going children access free schooling. To operationalize this right, the basic education act 2013 was enacted. This is a follow up of FPE that was launched by Minister of Science and Technology (MoEST) in 2003. Levies and fees were abolished in primary schools in Kenya (Makorani et al., 2017). However, studies by Njorege (2013), Mboi et al., (2013), Munda et al., (2014), Obar, (2014), Shavanga (2015), and Mbalaka et al., (2021) indicate that despite the

government abolishing the levies they still exist in Kenyan schools. According to the study by Shavanga (2015), levies such as remedial teaching, uniform, stationary, levies for school activities, sports and clubs' levies, development funds, educational tours, examination fees, and salaries exist in schools. In other studies, it has been established that 100% of the pupils paid activity fee, 66.7% paid for gifts fee, 83.3% paid PTA fund, 100% of pupils paid exam fee, 16.7% paid for remedial tuition while 5% paid for computer fee (Njoroge, 2013). This is apparent from the study of Obar, (2014), who also established that a large population about 72% reported to have paid over 1,000/= in a term.

While evidence shows that school levies still exist in primary schools in Kenya, most of these results reflect partial equilibrium analysis, with the government efforts nationwide abolition of public-school fees charges in Kenya in 2003. It is evident that this move contributed to a decrease in total enrollment rates of pupils to public schools, but rather a dramatic shift toward private schooling. This difference between partial- and general-equilibrium effect is partially explained by social interactions: The entry of poorer pupils into free education contributed to the exit of their more affluent peers. According to Schmidt (2006), elimination of fees has resulted in perceptions of reduced educational quality, limiting the benefits of primary schooling and therefore restricting economic growth. This compromises teachers' performance and quality of education (UNESCO, 2005). If a decrease in school fees is complimented by a decrease in the quality of education, then positive incentive of reduced cost was mitigated by the negative incentive of reduced quality. In other words, if less money means poorer quality, then the benefits

of dropping user fees could be negligible (Schmidt, 2006). This could be a reason suggesting why parents are willing to spend money in terms of motivational levies, remedial levies, examination levies, and extra cost of revision materials.

Despite the above studies, none had been done in Nyamira County public day primary schools to seek to establish how school levies affect academic performance. Yet, in Nyamira County, the continued and consistent dominance in achievement in KCPE by private and public boarding primary schools has raised concerns about the rising disparity in quality between public day primary schools and private/public boarding primary schools. Despite this, the existence of little empirical evidence, it is apparent that studies on the subject of school levies have not been explored so as to lay bare their effect on academic achievement. Therefore, it's worth noting, the findings of this research study may offer a long-lasting solution to the head teacher's, parents and caregivers' efforts towards the provision of desired standards, quality instruction and academic performance of every student in public day elementary schools across the nation, not only in Nyamira County as compared to the primary boarding schools in Nyamira County. This context largely informs the methodology and conceptualization of the study, which looks at school levies and academic attainment of public day primary school in Nyamira County Kenya.

## **1.2 Statement of the Problem**

The Kenyan government has worked to increase access to education to all and has taken meaningful measures to raise the standards of education at all levels by revising the

curriculum, availing adequate teaching materials and learning resources and recruiting and staffing of qualified teachers (Osero, et al., 2015). However, since the inception and implementation of FPE education program in 2003. In most Kenyan schools, school heads have experienced a growth in pupil's enrolment in their schools, such that by 2010 the enrollment had reached 8.2 million up from 5.2 million in 2002 (MOE, 2010), creating new challenges in the education sector. This state of affairs sparked off a debate among the stakeholders and educational experts on the issue of quality as measured by the examination outputs at the national level. Several studies conducted by Gakure, et al., (2013), Murunga, (2017), Wanjala, (2018), and Wanjohi, (2019) have blamed enrollment and the government policies on FPE low quality.

To mitigate the problem of quality in primary day schools the head teachers, parents and care givers, came up with raft of strategies and measures to aimed at making education offered meaning full. Notably, there was introduction of motivational levies, remedial levies, examination levies and even revision materials acquisition contribution. However, in the year 2013, the Ministry of Education through an Act of parliament 2013, banned various school levies. Despite the ban on the school levies by the Education Act 2013, there was a lee way provided by the Education Act 2013 for approval of such levies. This provision gave way for the public day primary schools' head teachers, stakeholders, parents and caregivers to revert to financial related strategies and ways to enhance the provision of quality education in a bid to leverage over private schools and public boarding primary schools.

Since then, according to the trend analysis the private schools have had a mean of 264.24 while the public boarding schools have had a mean of 281.52 and the public day primary school have had a mean of 218.64 in average between the year 2017 and 2018. This clearly indicates that the learner's KCPE performance in public day primary schools has continued declining and widening the performance gap with public boarding school and private boarding with public day primary school while the household are contributing towards improved academic achievement.

Since this strategy involving finances has been a popular approach in public day primary schools, little is known on the effectiveness of this strategies and approach. Further, from the preliminary study, no evidence of the effect of school levies as an approach towards academic achievement has been found. It is in light with this state of affairs that this research study was undertaken to examine financial approaches by head teachers and to establish the effect of school levies on academic performance in Kenya's Nyamira County public day elementary schools.

### **1.3 Purpose of the Study**

This research study was primarily designed examine the effect of school levies and academic achievement in public day primary schools in Nyamira County, Kenya.

### **1.4 Objectives of the Study**

The research was directed by the following specific study objectives: -

- i. To establish the effect of school motivational levies on academic achievement in public day primary schools in Nyamira County Kenya.

- ii. To establish the effect of school remedial levies on academic achievement in public day primary schools in Nyamira County Kenya.
- iii. To determine the effect of school examination levies on academic achievement in public day primary schools in Nyamira County Kenya.
- iv. To determine the effect of the cost of revision materials on academic achievement in public day primary schools in Nyamira County Kenya.

### **1.5. Hypotheses for the Study**

The following hypotheses were put to the test in this study:

- H<sub>0</sub>1: School motivational levies have no statistically significant effect on academic achievement in public day primary schools in Nyamira County Kenya.
- H<sub>0</sub>2: School remedial levies have no statistically significant effect on academic achievement in public day primary schools in Nyamira County Kenya.
- H<sub>0</sub>3: School examination levies have no statistically significant effect on academic achievement in public day primary schools in Nyamira County Kenya.
- H<sub>0</sub>4: The costs of revision materials have no statistically significant effect on academic achievement in public day primary schools in Nyamira County Kenya.

### **1.6 Justification of the Study**

Rationale behind this research topic is, the public day primary schools' continued low academic achievement in comparison to private and public boarding schools, even with financial help from sponsors, parents, guardians, and the government. From the preliminary findings by the researcher, various household contribute school levies to school for the purpose of enhancing academic achievement in the national examinations.

It is on this strength and need that this study was primarily designed to establish to what extent does the school levies affect academic performance of students in Nyamira County public day elementary schools, with efforts to come up with alternative approaches towards the provision of the desired quality of primary school education.

### **1.7 Significance of the Study**

This research intended at generating viable information for public day primary schools head teachers, boards of management, the parents and care givers with data on which motivational levies, affect the academic achievement. The study findings also provide insights that help head teachers, parents and officials in the Ministry of Education to know how various motivational approaches affect academic achievement. Teachers in primary schools, as the key participants are likely to benefit from the findings of this research, by knowing the importance of motivation for teachers and students on academic achievement and motivational interventions that may be required.

Secondly, the findings on remedial levies in public day primary schools provides a basis for the County Directors, TSC, policy makers and Ministry of Education to formulate or amend the existing policies and their framework and to align the educational policies with the regard to remedial levies.

Thirdly, the findings on effect of examinations levies on academic achievement in primary schools provides valuable insights on the importance of examinations on academic achievement. Further this study provides an empirical basis which supports the

County Directors, TSC, and Ministry of Education on the ban of mock examinations in schools.

Fourthly, when it comes to offering insights, the findings of the cost of revising materials on academic performance in public elementary schools is crucial into the education sector. Therefore, parents, head teachers and educational planners need to spare more resources on revision materials in schools. Further, the outcomes of this survey may be helpful to the Ministry of Education and decision-makers in making and formulating new policies, or amending the existing policies and their framework with the regard to the capitation to and any other financial support to public primary schools in Kenya.

Lastly, outcomes of this research survey, as regards to the school levies and how they affect academic achievement provides valuable data that may be useful by providing a working platform for upcoming research projects researchers, and students

### **1.8 The Scope of the Study**

The study was centered on the 2018 class eight pupil's academic achievement. This class was chosen since the class 2018 fell on the period of approval by the National Commission for Science Technology and Innovation as per the research permit. The respondents included in the sample were the school head from the selected schools.

The current research solely dealt with school motivational levies, school remedial levies, school examination levies and the cost of extra revision books and how they affected learning and academic achievement in only public day primary schools in Kenya, by mainly evaluating the Kenya Certificate of Primary Education examinations as tool of measure for success in education.

### **1.9 Limitations of the Study**

According to Mugenda et al., (2003), limitations are an aspect of research that may negatively affect the outcomes of a given research survey or an inquiry but which the researcher to a large extent may not have control over. However, according to Oso (2016) Limitations refer to hindrances or anticipated constraints or potential weaknesses of the study imposed by its methodology. On this basis the study was limited by a number of factors that were beyond the control of the researcher.

- i. Based on the research survey, it was determined that the research design used was this study's main limitation. The research design known as Ex - Post Facto was chosen for this investigation. The primary disadvantage of ex post facto research designs is their low external validity. Conversely, Ex - Post Facto research designs are favored over other designs due to their ability to establish causal claims and attain higher internal validity. Because Ex-Post Facto research designs are controlled and allow researchers to change the independent variable as they see fit, they are the only ones that can test exact predictions. (Oso (2016)

- ii. Although public day primary schools in the County are thought to be run similarly, the study's participants' openness and honesty were key factors in gathering data. Some of them were reluctant to provide information on the levies that were imposed in their schools. In order to get around this issue and give them reliable facts, the researcher promised them confidentiality.
- iii. Basing on the target population, only public day elementary schools located in Nyamira County were sampled for this investigation. The study's conclusions are therefore restricted to Nyamira County's public day elementary schools. As a result, not even private schools located in Nyamira County or all Kenyan counties can be said to benefit from the findings.
- iv. The study was limited to Nyamira County's public day elementary schools. Public boarding schools, private boarding primary schools and Private day primary schools were left out. However, stratified proportionate was used to guarantee that the sample was representative of the total population, sampling procedure was used.
- v. Only information from the 2018 class eight students in Nyamira County's public day primary schools was gathered. The justification for this selection of class eight students from the 2018 cohort enrolled in public day elementary schools in Nyamira County as primary respondents was in the fact that the approval of my

research permit by the National Commission for Science Technology and Innovation was limited to 2018.

### **1.10 Assumptions of the Study**

The study was guided with the following assumptions; -

- i. The study made assumption that county education board-approved school levies are charged by public day primary schools in the study area.
- ii. That parents at Nyamira County, actively support public day primary school's policies of paying school levies.
- iii. That head teachers have accurate data on various school levies charged by public day primary schools.
- iv. It was also assumed that the respondents were co – operate with the researcher to provide sincere and accurate answers to the research questions within the required time.

### **1.11 Theoretical Framework**

Kombo et al., (2006), defines a theoretical framework as a collection of interrelated ideas based on theories. Thus, the Educational Production Function (EPF) hypothesis acted as the basis for this study's theoretical framework. Education Production Function theory is a way to apply the production function notion of economics to the field of education, which claims that contributions to the educational process, which are mostly made by families, students, the community, and schools, determine education outcomes" (Sifuna, 2009). The Education Production Function represents mathematically the process where

by a school transform inputs such school levies into outputs in this case academic achievement (Stephen et al., 1990). This theory's proponents contend that more money spent on education will lead to greater learning and improved student performance.

A sociologist conducted the initial research that ultimately sparked interest in the concept of education production functions. James (1996) came to the conclusion that the influence of friends and compared to various educational inputs, family has a larger marginal impact on students' academic success. Later, Eric and Hanushek enhanced it, and other economists added the "production" framework to the evaluation of students' academic progress outcomes (Eric et al., 1989).

This theory was initially referred to as input output analysis and it served to highlight the direct policy significance of the inputs and outputs analysis in education. This kind of data is essential for "school management," as well as a host of other policy concerns like school integration, school accountability, and elementary and secondary school funding. It was later changed into "educational production functions" instead of simply input-output analyses (Dew et al., 2009). Student accomplishment is the common output, while the common inputs include school resources, teacher quality, and family characteristics (Eric, 2007).

According to the EPF theory, the process of producing educated individuals involves the utilization of limited financial, physical, and human resources. The outputs of education are therefore a function of the various inputs that are injected into the education system.

According to the EPF theory, differences in educational outcomes can be attributed to changes in the amount and caliber of school inputs.

The model used in this study was:

### **The Input-output Model**

The general EPF is expressed as;

$$A_i = f \{F_i(t), S_i(t), P_i(t), I_i(t)\} \dots\dots\dots (i)$$

Where i refer to the ith student; and (t) refers to an input.

A denotes educational output. Usually, educational performance and input categories F, S, P and I represent family background characteristics and school age abilities respectively (Simmons 1980).

In assessing the educational outcomes, it is important to consider the combined effects of all the input components. This research study however was specifically investigating the effects of school levies on academic achievement in public day primary schools. Taking school mean achievement in national examinations as dependent variable an equation is developed from the above equation.

$$E = f (V_1, V_2, V_3, V_4, V_z) \dots\dots\dots (ii)$$

Where;

E = Academic achievement

V<sub>1</sub>= Motivational levies

V<sub>2</sub> = Remedial Levies

V<sub>3</sub> = Examination Levies

V<sub>4</sub>= Extra cost of revision materials

The EPF was used to develop a model for data analysis, that is

$$DV_1=K+aV_2+bV_3+V_z,\dots\dots (iii)$$

Where a, b, c ..... are coefficient estimates, K is the constant, the independent variables are v<sub>2</sub>-v<sub>z</sub>, while the dependent variable is DV<sub>1</sub>.

such as motivational levies, remedial levies, examination levies and the extra cost of acquiring revision materials factors.

Dependent variable is the academic achievement of schools while the independent variables include: school levies such as motivational levies, remedial levies, examination levies and the extra cost of acquiring revision materials.

This theoretical framework was deemed suitable for this research study since it has both inputs and outputs of education. Figure 1 provides a conceptual framework for understanding this relationship.

### **1.12 Conceptual Framework**

According to Oso et al., (2009), the conceptual framework is described as schematic exhibition where research variables and their relationships are translated into a visual picture in order to demonstrate the relationship between the independent and dependent variables. This is not far from the description of Oseno (2014), who describes the conceptual framework as the diagrammatical presentation of the variables of study. The

conceptual framework presents the researchers understanding of the issue being investigated upon conducting a literature review (Oseno, 2014).

Based on education production function model, variables of this study were conceptualized as shown in figure 1 which identifies the relationship between school levies as an independent variable and a school academic achievement in KCPE examination as a dependent variable. The independent variables were studied through examining various school levies that includes motivational levies, remedial levies, examination levies and the cost of revision materials. The dependent variable is the school's academic achievement measured in terms of KCPE mean scores. The intervening variables include the schools date of registration, school enrollment, the sponsor of the school, and location of the school, learning facilities and staffing levels.

The variables in the conceptual framework relates with the theoretical framework which is based on EPF. The input of the Education Production Function showed the various school levies that includes motivational levies, remedial levies, examination levies and the cost of revision materials. While the output of the Education Production Function showed the level of achievement as measured by a school KCPE mean score. Figure 1 explains this link.

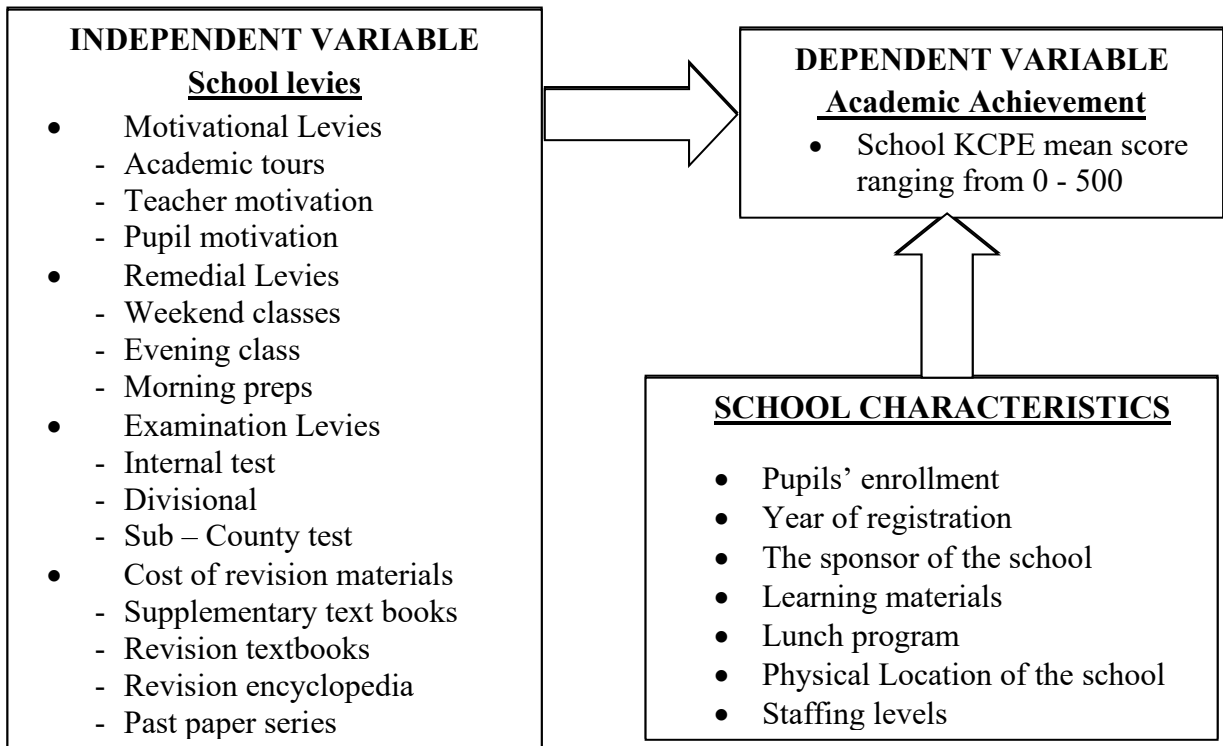


Figure 1: Conceptual Framework Showing the Interaction of Variables

Source: Own Concept, 2023

### 1.13 Operational Definition of Key Terms

According to Ghali et al., (2015), an explanation of words as they are employed in the study is known as an operational terminology definition. The definitions of the following terms are based on how they were used in this research study and may not be universal.

**School Levies:** In this research study school levies referred to all monies that households are required to spend on a child in the individual school on examination, remedial tuition, motivation, and extra cost of buying of revision materials for their class eight pupils.

**Motivation levies:** In this research study motivation levies referred to the total amount of money paid by households to motivate class eight pupils, academic tours, and teacher motivation.

**Academic tours levies:** In this research study academic tours levies referred to the total amount received from the parents for the purpose of academic tours in the year 2018.

**Remedial levies:** In this research it referred to the total amount paid by households for extra lessons (morning preps, evening preps, and weekend classes) per child in class eight in the year 2018.

**Examination levies:** In this research study examination levies referred to the total amount paid by households for assessment tests, end term examinations, mock examinations and any other examinations sat by class eight pupils in the year 2018.

**Cost of revision materials:** In this research study it referred to the total amount spent by household to buy the 2018 class eight pupil's revision materials not provided by the school.

**Public Day Primary School:** In this research study public day primary schools referred to those schools which are funded by the government and schools without boarding facilities.

**School Academic Achievement:** In this research study academic achievement referred to the educational outcomes as measured by school's mean in KCPE examination ranging from 0- 500.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

There are five subsections within this section. The very first part sub-section exhibits literature dealing with effect of motivational levies on academic achievement. The second sub-section reviews literature on remedial levies and academic achievement. Literature on examination levies and academic achievement is covered in the third section, while the fourth section provide literature on cost of textbooks and revision materials on academic achievement. Lastly, the last sub-section of literature review, summarizes the literature review by presenting a summary of literature reviewed and all identified gaps are provided in sub -section five. Review of literature for this study was drawn from books, journals, newspapers, government publications and documents, reports that may have had a bearing wholly or partially on the field of household funding and academic achievement. The gap in the literature is examined in relation to the present study.

#### **2.2 Motivational Levies and Academic Achievement**

At primary level, motivation plays an important role as compared to the other levels of learning due to the fact that young learners need to be motivated towards learning as they experience the new knowledge (Abbas et al, 2013 and Inyang, 2021). Motivation thus, is an indispensable requirement for efficient learning to take place (Auwalu, et al., 2021). However, according to Gachie et al., (2017), the teachers, along with the pupils, are all of value since the play an important part in the educational process because one cannot function without the other. That's the reason why, in every learning institution and school all over the world, teachers are equally important and that they are supposed to be

motivated because their willingness to work largely requires one to be motivated so as to for better performance (Ogunlade et al., 2015).

According to Filgona et al. (2020), the principle of motivation is closely related to other constructs in education and psychology as a complex part of human psychology and that's why Okumbe (1998) as cited by Aacha (2010) defines motivation as a physiological or psychological deficiency or need that activates behavior or a drive that is arrived at a goal or incentive. While Ascha (2010) description of motivation concept stand out, other reviewed studies such as Hornby (2000), Balunywa (2003), and Niwamanya (2016) express the concept as an incentive to act or move. However, these studies ignore the focus of monetary value which is considered a useful ingredient to motivation and which is a key focus of this study. Thus, the definition that was deemed suitable for this study in an attempt of fill this research gap was conceptualized from the operational definition of terms which states that, motivational levies refer to the total amount of money paid by households to motivate class eight pupils through price giving awards, academic tours and teacher motivation. This definition is considered appropriate because, it considers motivation levies as a monetary incentive which in this case is derived from the total amount of money the households contribute to the public day primary school for motivational purposes.

As a strategy used by head teachers in public primary schools to enhance academic achievement. From the literature reviewed, little focus has been put on the amount of money spent by the households for motivational purposes. It is evident that, not long ago, but in recent years, educators all over the world have revived strategies and means of motivating students, notably, the most popular has been using monetary strategies to

motivate learners to work extra hard in their classroom work towards improving in their performance outcomes (Slavin, 2010). As a strategy used by head teachers in public primary schools to enhance academic achievement. From literature reviewed, little focus has been put on the amount of money spent by the households for motivational purposes. Niwamanya (2016), conducted a research study in Sheema District in Uganda with the aim of exploring how financial and non-financial motivation affects the teacher performance of in some selected private secondary schools. Basing on the study conducted by Niwamanya (2016), the study's findings showed a substantial and favorable correlation between the financial reward that private secondary school teachers got and their performance ( $r=0.692$  at 0.000 significant level) as well as nonfinancial motivation being significantly positively related to what extent do private school secondary school teachers devote their time in Sheema District ( $r=0.616$  at 0.000 significant level). According to Niwamanya (2016), financial motivation greatly impacts on performance of teachers by 69.2% while non-financial motivation impacts by 61.6%. Therefore, basing on this study, it is evident that there is a greater need which requires a study to examine how motivation levies affect the learner academic achievement.

Mwango et al., (2012), as cited by Nkanatha (2013), carried a survey to which sought to establish what makes the students to perform dismally in English in public day schools and why they perform highly performance in boarding schools. According to Mwango et al., (2012), as cited by Nkanatha (2013), it was revealed from the study that, high performance was due to high motivation for both students and teachers. Accordingly, simulation must be introduced to students at all instructional levels (Adipo, 2015). Which also requires that motivating the learner to learn be pertinent to curriculum

implementation. All this is because motivation is an influential factor in the teaching-learning situations (Filgona et al., 2020). In view of the importance attached to pupils and teachers' motivation, this research study sought examined how motivational levies are used towards improving learner's achievement. in their KCPE examinations in public day primary schools in Nyamira County.

From global perspective, many countries all over the world have embraced the notion of motivation in schools. According to Macneil et al., (2009), reports from their research shows that globally-minded schools with positive cultures have inspired instructors in Texas. Additionally, Macneil et al. (2009) noted that teachers who possess a high level of motivation tend to achieve better results for their students in terms of performance. These studies are supported by Auwalu et al (2021), who carried an inquiry regarding students' motivation and how they performed academically in the University of Sultan Zainal Abidin Students. According to Auwalu et al (2021), the inquiry in this study revealed from computed result there existed a strong positive correlation between motivation and University Sultan Zainal Abidin students and their achievement in academics. The value of the computed  $r$  was found to be  $r= 0.667$  at  $p= 0.000$ ,  $p < 0.05$ . The obtained correlation value of 0.667 indicates that a strong relationship exists between motivation and University Sultan Zainal Abidin students' and their achievement in academics. This shows that for any increase in students' motivation, there will be a positive improvement in their academic performance (GPA).

Muralidharan et al., (2009) discuss the first concern and suggest that a transparently administered performance-linked pay program for teachers may actually increase intrinsic motivation in contexts (like India) where there is no differentiation of career

prospects based on effort. This study presents contextual difference for motivational approaches in schools in the USA, Malaysia and which significantly varies from the Kenyan schools and therefore the motivational approaches may vary and therefore the need for the current study.

Concerns over the unacceptably high percentage of unmotivated teachers in public school systems in many developing nations seem to be growing throughout Africa. These concerns stem from a variety of factors, including low morale and job satisfaction, inadequate controls and other behavioral sanctions, and poor incentives (Aacha, 2010). According to Kwame, (2007), in survey research that was conducted in Ghana, Tanzania, Malawi and Zambia regarding the effect of teacher's motivation and incentives. The interviews were held with key education stakeholders, including head teachers and teachers. According to Kwame, (2007), the outcome of the survey exhibited a large percentage of teachers in primary schools experienced poor motivational levels and low job satisfaction. As a result, millions of children are not being taught properly and do not receive an education that is minimally acceptable. This makes motivation a fundamental recipe for academic success (Gbollie et al., 2017). An investigation conducted by Male (2009), who investigated the perceived teachers' motivation and how it affected learners' performance in academics at A' level in selected secondary schools in Masaka District, Uganda. The study employed a cross-sectional survey research methodology, utilizing both qualitative and quantitative data analysis techniques. Structured questionnaires, comprehensive interview guides, field observations, and focus group discussion guides were used to gather data. According to Male (2009), the results of the study indicated a positive correlation ( $r = 0.494$ ) between students' academic

performance and financial motivators. and this relationship is statistically significant ( $p = 0.000$ ) at 0.01 level of significance.

Several studies by Nyamongo (2012), Reche et al., (2012), Yego (2013), Oyugi (2014), Asiago et al., (2018) and Nyawanda (2019), have established a positive effect of motivation on academic achievement. Basing on Oyugi (2014), on the study conducted on influence of teacher's terms of service and work environment, it was established that there is an effect of teachers' allowances and incentives on pupil's performance on KCPE examinations. Yego (2013) reports that in a study on the impact of reward systems on workers' productivity, the participants were selected using a simple random sample procedure and a descriptive survey research design. A sample size of 130 responders was chosen from the entire targeted population of 434 permanent teachers from Turbo Division's secondary and primary schools. The study findings were interpreted to mean that in the current setting, pay was the most important factor that influenced employee output ( $p = 0.004$ ,  $\beta = 0.674$ ). Yego (2013) included students from primary and secondary schools, but the precise amount spent was not investigated. For this reason, this study looked at how school levies affected students' academic performance in public day primary schools

While academic tours forms part of motivation levies. The Amosa et al. (2018) study examined how field trips affected the academic achievement of basic technology students in the Ilorin Metropolis, Nigeria. The findings revealed that at significant level, the value produced  $F(2, 22) = 3.44 > 0.109$  Therefore, hypothesis one was rejected. Also, at 0.05 significant level, the value produced  $F(2, 9) = 4.26 > 0.433$ . Therefore, hypothesis two was rejected. According to the results, teachers should, among other things, take their

pupils on field trips to foster active learning, self-motivation, discovery learning, and learning by experience.

Research on the impact of unit costs on students' performance on the Kenya Certificate of Secondary Education Examinations was carried out by Nyawanda (2019) in public secondary schools in the Vihiga sub-county. Nyawanda (2019) employed ex post facto, descriptive survey, and correlation study designs. The population was composed of twenty head teachers, three hundred instructors from twenty public secondary schools, and one Sub-County Director of Education. Saturated sampling was used to gather a sample of 18 head teachers, 307 instructors from 18 public secondary schools, and one Sub-County Director of Education. Questionnaires, document analysis, and interview schedules were used to gather data. According to the study, there is a favorable correlation between school unit costs and non-teacher unit costs and a moderate effect between teacher unit prices and students' performance on KCSE exams in public secondary schools. The study concluded that while non-teacher unit costs and school unit costs had a significant positive impact on students' performance in KCSE examinations in public secondary schools in Vihiga Sub-County, teacher unit costs had a moderate effect on students' performance in these exams.

In Kenya, while investigating how parents' failure to pay school levies affected the provision of services in public secondary schools in Kenya's Ainabkoi Sub-County, Uasin-Gishu County Morogo (2020), evidence was discovered indicating that parents' failure to pay school levies had a detrimental impact on staff performance, educational initiatives, school administration, and school project. In support of this finding, Kithokoo (2011) discovered data indicating that, in public primary schools in Yatta Division Lower

Yatta District, school factors influencing performance in the Kenya Certificate of Primary Education (KCPE) due to lack of books 24(7.5%), poverty 160(50%), lack of enough teachers 3(0.9%), lack of motivation 45(14.1%), stress 14(4.4%) and all the above 74(23.1%). This led to the conclusion that motivation in the part of learners and their teachers increased school performance but at the cost of greater inequality. Oyugi (2014) found that there is a relationship between teachers' allowances and incentives and students' performance on KCPE examinations in public primary schools. This study examined the effects of teachers' work environment and terms of service on KCPE performance in public primary schools in the Migori District. Similar studies by Wambugu (2018) established that teachers' appreciation through rewards and incentives for performance enhances work commitment, increases engagement with students, leading to improved academic performance. While evidence gathered in this section shows that low motivation affects the quality of education offered, little has been examined in regards to how much motivation is required for the purpose of academic performance. Which this study seeks to establish the effects of motivational levies on academic achievement in public day primary schools.

While through rewards and incentives improved academic achievement, in public secondary schools in Kenya, Asiago et al. (2018) studied the impact of educational funding on students' academic performance on the Kenya Certificate of Secondary Education Examination (KCSE). Regression model  $Y=a+bX$  was used in the study, where Y is the dependent variable (KCSE mean score), a-is the regression equation's constant, b is the value of the independent variable's coefficient, and X is the value of the independent variable. In this instance, the financial resources of the school were the

independent variable. Thus, the regression analysis equation becomes.  $Y = 2.04 + 1.820x$  school financial resources. This indicates that the KCSE mean score rises by 1.82 units for every unit increase in school financial resources. Therefore, the more adequate the school financial resources, the higher the schools' KCSE mean score. Since  $p < 0.001$ , then the relationship between school KCSE mean score and school financial resources is highly significant. Since  $R^2 = 0.111$ , it also implied that school financial resources predicted school KCSE mean score by 11.1 percent. The study has therefore demonstrated that the association between the KCSE mean score and the financial resources of the school is statistically significant. This result further implies that money levied in public day primary schools in terms of remedial fees has a significant effect of academic achievement. However, this study was done in secondary school and it may not be generalized to the primary schools thus this study sought to explore how motivational levies affect the performance of class eight pupils in their KCPE performance in Nyamira County.

Further according to the study done by Nyamongo (2012), on the impact of learning resources on performance in Kenya Certificate of Primary Education: A case of Nyamira District, Nyamira County, it was established that in all the schools, head teachers award well performing pupils in their schools. Further according to Nyamongo (2012), head teachers indicated that the main problems that inhibit improvement of KCPE results in the schools are; uncooperative parents, lack of books, lack of support from school committee, low teacher morale, frequent transfer of teachers, and other problems for example absenteeism of the pupils and lack of support from education office. However, this study did not specifically look at school motivational levies a variable for

consideration hence the relevance of this study in regard to the influence school levies on academic achievement in public day primary school in Nyamira County.

In their research, Kiage et al. (2014) examined how girls' enrollment in boarding public secondary schools in Trans Mara sub-County, Kenya, was impacted by the payment of extra levies and expenses. Questionnaires and interview schedules were used to collect data for the study, which used correlational and descriptive survey methodologies. Six principals, one sub-county education officer, and 153 female pupils made up the study sample. The study established that Prize giving /motivation levy negatively influenced girls' enrolment such that an increase in the levy reduced enrolment by 0.12% as was signified by a coefficient of determination of 0.0012. The relationship was not statistically significant. It was also determined that the additional levies paid for lunch, uniforms, teacher motivation, and development rendered the expense of secondary education for Maasai girls unaffordable. This resulted in a dip in enrollment and completion rates as girls whose parents could not afford the additional levies dropped out of school. While this study was done in secondary schools there is need to examine whether there is an effect of motivational levies in public day primary schools a gap that this study seeks to fill. In light of this, the purpose of this study is to ascertain whether or how motivating levies affect students' academic performance in Nyamira County's public elementary schools.

While evidence gathered in this section shows that low motivation affects the quality of education offered, little has been examined in regards to how much the households should spend for motivation as required for the purpose of academic performance. It is in line with this that this study is undertaken to fill in this gap in the literature.

### **2.3 Remedial Levies and Academic Achievement**

Analice (2012), defines remedial as specific educational interventions aimed at addressing learning needs of a targeted group of children who are lagging behind academically or not mastering specific competences in the early grades. While Mogeni et al., (2018) refer to remedial teaching as learning activities that cater for late learners. Ochieng (2016) defines remedial as one-on-one learning session organized by the teacher aimed at alleviating instructional defects in a learner, eliminating incorrect habits and restoring lost self-confidence. Positively associated with Ochieng (2016), Huang, (2010) refers to remedial as a type of clinical teaching where a child receives both diagnosis and treatment until successful recovery is achieved. However, from the analysis of various definitions by Huang, (2010), Analice (2012) and Mogeni, et al. (2018) the concept of remedial levies has not been defined. In view of this gap, the study conceptualized the definition of remedial levies as the total amount paid by households for extra lessons (morning preps, evening preps, and weekend classes) per child in public day primary schools.

Preps are held daily in public day primary schools in the early morning and after courses (Asaba, 2016). According Mogeni et al. (2018) parents in support of remedial classes claim that schools are a custodian of their children while they attend to other duties, children are busy throughout away from home influence and would like their children to read well. Supplementary tuition therefore is a common practice during holidays, weekends and evening and even within the normal school hours (Ngugi, 2012).

In Ireland, the formal provision of remedial education within the national school system coincides with the genesis of a more child centered philosophy of education (Munene, et

al. 2017). In European countries, remedial education program points out that by relating the individual learning differences to pupil's developmental situations, teachers can develop appropriate activities that meet the needs of their learners (Leyser et al., 2001). Koya (2015) claims that the Fijian government gives its basic education institutions funding for things like tuition and instructor salaries, among other things. But the schools charge more to cover sports, school publications, textbooks, additional tuition, building costs, uniform costs, coaching costs, and book rental fees (Koya, 2015). According to Mogeni (2018), in the past, the broad utilization of remedial education was bound to a couple of nations. Consumption on remedial instruction has extended quickly in the post-communist countries of Eastern Europe and also in several states such as India, South Africa, South Korea, Portugal, Brazil, Turkey and Kenya (Bray 1999) as cited by Mogeni (2018). More recently, a few Western nations like Canada, France, England and Austria have developed remediation programs (Davies 2004, Ireson et al, 2005). In Hong Kong remedial teaching is reflected by substantial adverts of different kinds of remedial education in roads, prevalent open regions, through the mass communication and by the expanding number of enrolled mass remedial classes (Kwok, 2004). According to Jayachandran (2014), a lot of children in developing nations in Africa receive tutoring on top of their regular academic curriculum. It is therefore noted that from global perspective little has been done to link remedial levies with academic achievement which this study sought to examine.

Numerous scholars have undertaken studies that support the notion that academic achievement in elementary schools and remedial instruction are positively correlated. Mboi et al, (2013), Asuba (2016), Asiago, Kalai et al., (2018), in their studies, there exist

evidence that remedial programs, such as educational interventions, have a significant effect upon students' academic achievement. This concept is also advanced by Asiago, et. al (2018), on influence of school financial resources on student academic achievement in Kenya Certificate of Secondary Education Examination (KCSE) in Public Secondary Schools in Kenya where it was revealed that statistically significant relationship between school financial resources and school KCSE mean score existed. School financial resources predicted school K.C.S.E. mean score at 11.1 percent. While Asiago, Kalai & Gichuhi (2018), delved on financial aspect in secondary school, similar relationship can exist in remediation in public day primary schools due to the fact that remedial is pegged on the financial resources available.

Other available studies such as Little et al., (2008), Kumar (2016), Betül et al. (2019) & Sharma et al., (2023), have found that these remedial courses had academic, social, psychological, economic, and career development impacts on students' lives. In support, Little et al., (2008), contends that there is a positive difference in math exam scores and high school attendance. According to Little et al., (2008) students who attended remedial lessons, achieved better academic results. It is thus, clear that according to Betül et al. (2019), students had better attitudes toward learning and were more engaged in learning, completed their homework, had fewer disciplinary problems, earned better grades, and had lower dropout rates as a result of remedial classes. For remedial to be successful, Kumar (2016), asserts that, it should take the pupil at his own level and by intrinsic methods of motivation to lead him to increased standards of competence. It is therefore, based upon careful diagnosis of defects and in general to the needs and interest of pupils (Kumar, 2016). Similarly, Sharma et al., (2023), purports that, the primary purpose of

remedial courses therefore, is to provide targeted instruction and support to students who require additional assistance to catch up with their peers. It is however, not clear then, what contribution is made by remedial levies. Thus, this study seeks to fill this gap in research.

In contrast, a study by William et al. (2014) examined the effects of the "hidden costs" of education in relation to Rwanda's policy of free education. The results of their investigation showed that the fees levied by schools had a detrimental effect on students' completion of their education, attendance, and academic achievement. This finding is in line with the studies by Ngwenya (2016), Yameda et al (2009). While this mandatory style of revision for many is an opportunity to enhance performance, Asaba (2016), opines those preps encroach on normal sleep time and there are chances that they could negatively impact academic performance.

While remedial has been valued by parents, teachers, and learners, it goes along with payment of some levies. This is evidenced by the study that was conducted by Obar (2014), on implications of private supplementary tuition on student's academic performance in Awendo Sub-County, which revealed that a large population of about 72% reported to have paid over 1,000/= in a term. Research studies has indicated that parents, teachers and other stakeholders in education continue to invest resources in remedial program in order to improve performance of pupils in primary schools in Kenya (Munene,et al., 2017). It was in view of this that, that this study was undertaken to establish the effect of remedial levies on academic achievement.

In Kenya, primary school teachers are required to work for eight hours a day for five days in a week. Teacher's contractual working time includes the statutory hours devoted to actual teaching as well as the statutory hours devoted to teaching related activities (when specified), such as lesson preparation, correction, in – service training, staff meetings, student support and co – curricular activities (Wasanga et al., 2010). In their report to the National Assessment Centre Wasanga, et al (2010), reported that 71.0% of teachers are involved in remedial teaching, however 60% indicated that this is done to a small extent. While their involvement cannot be free, it may not be very clear on who meets the cost thus this study to fill this research gap through the examination of remedial levies.

Muchiri (2018), examined effect of hidden costs on pupil's participation in public primary schools in Nyeri Municipality. Notably, the research study in its findings revealed that despite public primary education being free, there are still costs that parents pay, such as remedial classes, books, uniforms, stationery, school activities such as sports and clubs, development funds, educational tours, examination fees and watchman's fees, PTA fees and BOG teachers' salaries. This indicates that in public day primary schools' parents are willing to contribute to schools in terms paying for remedial fees.

In a different study by Maithya et al., (2021), on extra levies as determinant factor in the implementation of free and compulsory education in public day secondary schools in Kenya The study also revealed that some of the extra levies charged according to the chairpersons of the parents associations are meant to cover costs associated with, remedial teaching, books purchase, students' trips, rallies, BOM teachers' salaries, school's infrastructure development and teacher motivation.

A study conducted in Kwanza sub county on the impact of extracurricular educational charges on students' attendance in public day secondary schools lends credence to these findings (Shavanga, 2015). The study included a sample of 1827 respondents, comprising 50 teachers, 811 parents, and 966 students, using a descriptive survey approach. According to the report, levies were paid for development, extracurricular activities, and remedial instruction. In Nakuru County, Mogeni (2018), conducted a study where he sought to examine efficacy of remedial teaching and influence on performance of learners in English Language in primary schools in Nakuru County, the study revealed that the percentage performance trend after remedial teaching were much higher than those of pupils before the remedial teaching. This is an implication that pupils who are given remedial lessons perform better academically and are thereafter placed to join a good secondary school. However, these studies do not indicate the cost of this remediation which is the purpose of this study.

Mutua (2015) conducted a study to establish the perceived effects of extra tuition on academic performance in public secondary schools Matungulu Sub-County Machakos County the study utilized the descriptive survey design for the study. 10 schools (representing 30% of the population) were randomly sampled for this study. A total of 250 respondents participated in the study. They included 10 principals (representing 30% of all the principals), 40 teachers (representing 10% of the total number of teachers), 160 students (representing 10% of all the student's population) and 40 parents (representing 2% of all the parents available). Questionnaires were used as instruments for data collection. The study found 39(97.5%) of the parents said that extra tuition improves

academic performance of their children while 1(2.5%) of the parents said that extra tuition does not improve academic performance of their children. Reasons as to why parents felt that extra tuition improves performance included the following: extra tuition helps in syllabus coverage, helps weak students to improve, allows enough time for revision and helps to improve individual and school performance.

To expand our understanding of the effect of remedial levies on academic achievement this study examined the effect of total amount of money collected by head teachers on academic achievement. According to Munene, Kimiti & Njoka (2017) who cited Kuester (2003), notes that, while proponents argue that remediation provide opportunities for underprepared learners to gain the necessary competencies, critics suggest that it provides disincentives for learners and that remedial lesson impede individual progress. However, studies by Munda et al., (2014), on the influence of education costs on student's academic performance in Kenya: an Empirical Study of Bungoma County secondary schools indicated in their second objective which was set out to determine how education costs relate to the academic performance of district and county schools revealed that unit cost was significantly related to performance at  $\alpha = 0.05$ . The correlation coefficient was found to be positive: therefore, increasing unit cost was likely to have a positive impact on performance (Munda et al., 2014).

In order to determine how unit cost affected students' academic performance in Nandi County's Day and boarding schools, Ngetich et al. (2018) conducted an investigation. Ngetich et al. (2018) focused on the principals of 186 public secondary schools in Nandi County for their study. The data was collected by the use of stratified random sampling, followed by systematic random sample questionnaires and document analysis. Means,

percentages, and linear regression analysis were used to examine the data. Ngetich et al. (2018) determined the average unit costs for day and boarding secondary school to be Ksh 22,263 and Ksh 54,828 respectively. Additionally, the results showed that the average mean academic performance for Day Secondary schools and Boarding schools for the 2012–2015 period was 4.7391 and 7.1184, respectively. According to the study, academic achievement and unit cost in boarding schools had a positive significant link ( $p = 0.000$ ;  $t(28) = 4.192$ ,  $p < 0.05$ ). Similarly, academic performance and unit cost in day schools had a positive significant connection ( $p = 0.014$ ),  $t(91) = 2,503$ ,  $p < 0.05$ .

In public secondary schools in Vihiga Sub-County, Nyawanda (2019) studied the impact of unit charges on students' performance in the Kenya Certificate of Secondary School Education Examinations. Twenty head teachers, three hundred teachers from twenty public secondary schools, and one Sub-County Director of Education made up the population. A sample of 18 head teachers, 307 instructors from 18 public secondary schools, and one Sub-County Director of Education were obtained using the saturated sampling method. Questionnaires, document analysis, and interview schedules were used to gather data. According to the study, there is a favorable correlation between school unit costs and non-teacher unit costs and a moderate effect between teacher unit prices and students' performance on KCSE exams in public secondary schools. The findings indicate that the performance of students in KCSE exams in public secondary schools in Vihiga Sub-County is moderately impacted by teacher unit costs; however, non-teacher unit costs and school unit costs significantly positively impact student performance. The reviewed study presents a conceptual gap in that it focused on the effect of unit cost as its

independent variable while the independent variable of this study is remedial levies and how they affect academic achievement on public day primary school.

Few studies have indicated that there is an insignificant relationship between remedial and academic achievement, In Kitui according to Wanaina (2016), in a study carried out to investigate the effect of user charges on participation in education among students in Kitui County, Kenya. On the types of user charges in public secondary schools, the study found out that all the schools levy a number of user charges ranging from remedial, purchase of text books and other educational materials to motivational charges. The study established that 55% of the principals and 49% of the teachers felt that the escalation of fees and levies charged to a high extent contribute to poor performance. While this study was conducted in Public Secondary schools much may not be known on the effect of remedial levies in public day primary schools thus, this study sought to fill this research gap.

While Kago (2012), in his study established that limited studies have been carried out on school levies and their effect on access and retention under the subsidized secondary education policy. Similarly, majority of the authors that I have come across in the literature review have not focused on the effects of the remedial levies and their effects on academic achievement. It is against this backdrop that the present study regressed the head teachers views in order to explore the effect of remedial levies on academic achievement in public day primary schools and then find out whether morning remedial, evening remedial or weekend classes have a direct effect on academic achievement.

## **2.4 Examination Levies and Academic Achievement**

Examinations according to the Concise Oxford Dictionary, First Edition (2019) is defined as: “Testing of knowledge or ability of pupils or candidates by oral or written questions or exercise”. Thungu et al. (2016), also defines examination as a formal test of somebody’s knowledge and ability in a particular subject, especially by means of written questions or practical exercises. Similarly Ochieng (2016), refers examination to a test constructed in learning institutions including Continuous Assessment Tests and End-Term examinations to assess the progress of learners. In further examination of these definitions Odhiambo (2015), refers examinations as Mock examination which is an examination done at some time interval so as to assess formative development of the learner. However, far from this, the study sought to examine the concept of examination levies.

Examination levies can well be described as the total amount spend by households for internal schools’ assessment tests, divisional tests, sub- county mocks and any other examinations sat by learners in public day primary schools. Public day primary schools in Kenya largely depend on parents to finance external and internal examinations (Areba, 2011). Studies conducted by Wachira, (2012), on assessment practices in Kenyan primary schools and their effect on learning, showed that most of the teachers rely heavily on past examination papers or purchase papers sold commercially in the Kenyan market. This practice has been there for a while which Njoroge (2013), on his study on the influence of

hidden costs in education on academic performance in public schools established that, extra school levies charged in almost all schools are activity and examination levies.

According to a study conducted by Ngwenya (2016) on how to most effectively collect fees from students in Zimbabwean primary schools without violating their rights, supplementary levies had to be charged even if tuition in rural primary schools was free. Exams, boarding, paying teaching and non-teaching staff, providing equipment, and repairs, maintenance, and improvements were all covered by the levies imposed. Lower completion rates were the result of several students quitting because they were unable to pay the additional levies. Karemesi (2010) noted that expenses related to examinations, pay supplements, textbooks, instructional materials, school uniforms, transportation, food, and extracurricular activities pose significant obstacles to the attainment of universal basic education in Rwanda, particularly for the impoverished.

While several studies reviewed under this section have indirectly examined the relationship between examination levies and educational achievement. Costs that are involved have had a negative impact on academic achievements. In Rwanda, repetition rates remain high and completion rates low, attributable to the charging of extra levies (William & Abbot, 2014). Similar studies in Rwanda by Mugiraneza (2018) sought to investigate hidden costs and their impact on students' participation in basic education. Confirmed that costs of participating in different examinations have significant impacts on student's transition rate in 12YBE in Rwanda. In other studies, by Mackatiani (2017), in which the study investigated the influence of examinations-oriented approaches on quality education in primary schools in Kenya. The results from the study revealed that

there was no significant relationship between the influence of examinations-oriented approaches and quality education in public and private primary schools. This was supported by the Durbin-Watson statistical test. The Durbin-Watson statistical is always between 0 and 4. The DW of  $H_0: \rho > 0$ . P was 1.521. This indicates negative autocorrelation.

However other studies by Awour (2012), and Achoka et al. (2022), have however indicated a positive relationship between examinations and academic achievement. This is evidenced by the study that was conducted Achoka et al. (2022), on effectiveness of schools' examination practices on KCSE performance in public secondary schools in Kakamega County. Which revealed that the respondents reported that they had increased their students' average admission score (Mean=3.9000, Std. Dev = .87560) and that the findings revealed that the internal examinations scores were a true reflection of the scores got at KCSE within (Mean=3.8000, Std. Dev = 1.13529).

Primary level education in the Kenyan Republic is free and compulsory. Although education is free in Kenya, there are school-based levies that are directly collected by public primary schools from households for the support of teaching, learning and administration processes. Much of these levies are collected as examinations fees which is an easier way of collecting the fees from the parents. Literature indicates that public day primary schools in Kenya largely depend on parents to finance external and internal examinations (Areba, 2011). This funds such as examination levies have an effect on academic achievement. For instance, in the study that was conducted by Ndolo et al., (2017), on the impact of free secondary education policy on secondary school student

academic performance in Kenya: A case Study of Mbita and Suba Sub –County. It was observed that one-unit increase in free secondary education funding led increase in student mean score. The increase in free secondary education funding by Ksh.10, 265 improved students' academic performance by at least 1.0 mean score. This means that with additional increase of examination levies in public day primary schools examination mean standard score improved by 1.0 mean score.

Performance is high on the national agenda in Kenya, according to research, with educators and policy makers concentrating on testing, accountability, curriculum reform, teacher quality, and head teachers' management strategies (Cheruiyot, 2021). A review of literature indicates that there is a relationship between examinations and academic achievement in schools. In Awuor's (2012) study, which used a survey design, the impact of economic activities on students' academic achievement at Kenya Certificate of Primary Education in Lari Division, Kiambu, was examined. A questionnaire was the primary tool used to gather data. The study's conclusions showed that low academic performance was influenced by head teachers' leadership, tuition fees, and school fees for study tours, examinations, support staff, and study tours.

Unfortunately, in Kenya, there exists limited empirical work on the impact of education inputs on outputs and outcomes (Ngware, et al. 2016). However, based on the literature review, for instance in the study conducted by Morogo, et al. (2018), on impact of non-payment of school levies by parents on secondary school programmes and projects in Ainabkoi Subcounty, Uasin-Gishu County. From the interviews, the study established that non-payment of school levies by parents negatively affected educational programmes and school projects. While these studies look at non - payment of school charges. There

still remains a research gap on the concept of school levies and its effects on academic achievement in public day primary schools in Kenya.

It is, therefore, important to note that, through the review of literature there is no study which has quantified the total amount of examination levies. No study reviewed has examined the effect of examination levies on academic achievement. It is against this that this study is devoured to fill this research gap by examining the effect of examination levies on academic achievement.

### **2.5 The Cost of Learning and Revision Materials and Academic Achievement**

The cost of revision material according to this study is the total amount spent by the households to buy class eight pupils revision materials not provided by public day primary schools. Whereas the study seeks to establish the effects of cost revision materials, majority of the authors under this literature review have not defined the any concept relating to the total cost of revision materials. However, it is argued by Nyamongo (2012), basing on his findings of which out of the head teacher interviewed in Nyamira Central District 29 head teachers indicated that the main problems that inhibit improvement of KCPE results in public day primary schools are; uncooperative parents, lack of revision books. Due to the desire for academic excellence most parents in the public day primary school are willing to go an extra mile to invest on revision materials once their children are in class eight. To pay for these investments, parents buy a variety of revision textbooks, past examination papers and other series examination papers that are being sold in bookshops.

Globally, the concept of household expenditure on Capron (2015) observes that the United Kingdom's (UK) notion of free education is hardly feasible, since parents spend an average of £800 a year on additional taxes per child. These school levies cover the price of supplies, activities, trips, transport, food, and uniform. Capron (2015) conducted a study on the effects of additional levies on students' academic performance and attendance at schools in the United Kingdom. According to the report, 20% of kids from the poorest households missed out on sports lessons because they couldn't afford the appropriate equipment, 20% missed out on school lunches, and 30% didn't have enough money for tuition. The study also discovered that because they couldn't afford computers and internet access at home, one-third of the poorest children had fallen behind in their academics. Some of the students left school as a result of this. Nonetheless, the absence of a detailed analysis of the structure, expenses, and impact of individual user fees on academic performance was a weakness in the UK study conducted by Capron.

Farthing (2014) looked at the price of school supplies as part of his investigation of the expenses of attending school from the viewpoints of young people. A series of questions regarding the expense of attending school were posed in an online survey used for this study. Young students from England, Scotland, and Northern Ireland made up the respondents. According to survey responses, 21% of students reported that they were unable to obtain the books and stationery they needed for their studies. More students from low-income families than from relatively wealthy families were affected by the lack of these supplies. The results of this poll determined the percentage of students who struggle with a lack of school supplies without outlining how associated expenses affect students' involvement.

According to a UNICEF study (2017), Somaliland in Africa announced primary public education to be free in 2011. However, because of the country's poor economic standing, the government does not adequately fund the schools. Insufficient funding for schools results in inadequate physical infrastructure, inadequate teaching and learning resources, and subpar school administration. Additionally, learners are compelled to pay more for stationery (Maithya, Cheloti & Mbalaka, 2021).

According to the Nigerian National Policy on Education (2014), education is a costly social service that needs sufficient funding from all levels of government in order to be successfully implemented. Insufficient learning resources and instructional materials, which are expensive to run as public, private, or day schools, pose a challenge to meeting students' academic performance and achievement. This discourages effective teaching and learning, according to a 2015 study by Dang & colleagues in Nigeria on the impact of finance on secondary school students' academic performance in Bakwanga Local Government of Nassarawa State. Comparably, in Akinkugbe & Kunene's (2001) study, "The Swaziland Case Study: Education Financing and Budgetary Reforms in Africa," Additionally, it was determined that there was a significant shortage of resources, notably for the equipment and supplies required to deliver a top-notch education in Swaziland's primary schools.

Extra levies in South Africa are considered donations to education that parents and sponsors are obligated to pay, either in cash or in kind, above and beyond the legally prescribed school fees (Pillay, 2012). When schools need parents to pay for capital

equipment, infrastructure installations, textbooks, stationery, and other expenses, the additional costs are faced by the parents.

In the East African Community (EAC) region, in Uganda, basing of the Ministry of Education and Sports (2008) report on Primary Education in Uganda. A proportion of UPE capitation grants (35%) is set aside for schools to purchase supplementary materials (mainly supplementary readers, teacher reference books, wall charts, chalk, blackboards, etc.) in line with established UPE capitation grant expenditure guidelines. Apart from these grants, resources are made available through the government recurrent budget for bulk purchases of these materials. The Instructional Materials Unit (IMU) coordinates these purchases. However, the report did not indicate the total amount of money spent by households in acquiring revision materials which is key to this study.

Several studies reviewed under this section have indirectly examined the relationship between cost of revision materials on academic achievement. Ndlovu (2018) used a 3-Level Hierarchical Linear Model (HLM) to analyze how school resources affected Zimbabwean students' math achievement. According to the study, student test scores are improved by having a teacher with training in the relevant topic, small class sizes, a highly qualified school head, and a school with usually abundant resources. Nonetheless, having textbooks was thought to be a negligible indicator of students' academic success.

While many economists (e.g., Eric A. Hanushek 1995 and Lant Pritchett & Deon Filmer 1999), as mentioned by Glewwe, Kremer & Moulin (2009), contend that increased educational spending will have a limited influence on learning in biased educational systems. Studies by Odanga (2018), Mbugua, Kibet, Muthaa and Nkonke (2012), and

Oluoch (2011) have shown that the provision of pertinent and high-quality, long-lasting materials, such as textbooks, is necessary for the effective implementation of a curriculum. Mbugua et al. (2012) and Odanga (2018) both link low academic attainment to issues like understaffing and subpar teaching and learning resources

The quality of education offered in a school is determined by the level of material inputs allocated to the school and the efficiency with which these materials are organized and managed to raise student achievement (Rono, 2017). That's why investment in education (either private or social) depends on the proportion of resources allocated to education and the method of financing cost of education (Ekanen et al., 2013).

Service delivery in educational institutions is entirely dependent on financing (Morogo, et al., 2018). That's why according to Asiago, Kalai & Gichuhi (2018) the Issues of education funding and adequacy of school financial resources have been highly debated both in developing and developed countries. Policy makers, tax payers and other education stakeholders do wonder whether schools that receive the most in terms of financial resources produce most in terms of measurable student outcome (Asiago et, al, 2018).

Tetty (2016) studied how much the chosen community secondary schools in the Rombo District use appropriate and high-quality teaching resources in the classroom and how this has improved students' academic achievement. A cross-sectional survey design was used in the study. All of the community secondary schools in the Rombo district were included in the research population. Five randomly chosen community secondary schools were chosen for data collection out of the 38 in the Rombo district. Twenty pupils and

five teachers completed semi-structured questionnaires in each school. According to the study, the success of teachers and students is largely dependent on the instructional materials they use. Although the research population was smaller than that of the current study, it did delve deeper into the issue of material cost, which is what this study aims to investigate.

In Kenya several studies reviewed under this section have indirectly examined the relationship between examination levies and educational achievement. For instance, the study by Kithokoo (2011) on school factors affecting performance in Kenya Certificate of Primary Education (KCPE) in public primary schools in Yatta Division Lower Yatta District, the pupils gave several reasons why they perform poorly. The reasons include; lack of books 24(7.5%), poverty 160(50%), lack of enough teachers 3(0.9%), lack of motivation 45(14.1%), stress 14(4.4%) and all the above 74(23.1%). Notably, the study revealed that learners perform poorly due to lack of books at 24(7.5%). In a more recent study conducted by Matheka (2016) on Influence of School Factors on Public Primary Pupil's Academic Performance in Yatta Division, Yatta Sub-County, Machakos County, similar results were obtained where by the study findings conclude that pupil's textbooks and library text books are inadequate with 52.50 %, indicating that the books were insufficient in most primary schools and that 76.23% of the schools.

In addition, Wairimu (2014), explored the study on factors influencing pupil's performance in national examination in public and private primary schools in Nakuru-North Sub-County. The total sample for the study comprised of 26 head teachers, 130 teachers, 260 pupils and one educational officer. After the analysis of the data collected, the study findings revealed that half of the head teachers in public schools indicated that

teaching and learning reference books and ICT equipment were not available at all in their schools which negatively affected their academic achievement. Although these studies have endeavored to establish the relationship between availability of textbooks and academic performance. Still there is a gap which this study seeks to fill in examining the effect of the cost of revision materials on academic achievement.

Similarly, Chirchir et al., (2018) highlights through a study that was conducted on the effects of school-based factors on academic performance in public primary schools in Njiru Sub County, Nairobi Kenya. The study further sought to establish the extent to which textbooks influenced academic performance public primary schools. The results of the observation established that Maths and language books were shared in all the schools. Four 66.7% of the schools had a ratio of 1:3 while 2 had six pupils sharing a book. Other textbooks were also shared by 6 pupils in majority 83.3% while one of the schools (1) 16.7% had one book shared by 10 pupils. The study further concluded that majority of the schools in Njiru do not have enough textbooks which affected their performance

These studies have further been supported by several studies by Asiago, Kalai & Gichuhi (2018), Wanyonyi et al., (2019) and Naisiano et al., (2020) Whereby Wanyonyi & Kangangi (2019), undertook a study to examine the factors influencing students' academic performance in Kenya Certificate of Secondary Education in Kirinyaga Central Sub-County, Kirinyaga County, Kenya and it was observed that 94.1% of the respondents agreed that school resources influence students' performance. These include enough teachers, textbooks, buildings, revision materials etc. Whereas the study was conducted in the secondary school. In support Naisiano et al., (2020) conducted a study in which they sought to establish the influence of teaching and learning materials available on the

development of pupils in upper primary schools in Karunga Zone, Gilgil Sub County. The study was anchored on the Theory of Instruction and adopted the descriptive research design. The target population was 587 teachers of primary schools in Karunga zone, Gilgil Sub County from which a sample of 100 teachers were selected using the stratified random sampling method. Data was collected using questionnaires and analyzed through descriptive and inferential statistics. Results showed that teaching and learning materials availability ( $r = .652, p .000$ ;  $\beta = .751, p .000$ ) has a positive and statistically significant influence on the development of pupils in upper primary. However, this study did not particularly delve into the aspect revision material which is under study.

However, while a study in this area would seek to find out the effects of the cost of revision materials on academic achievement in public day primary schools. Lucinda & Leo (2020) argues that undergraduate student perspectives on textbook costs and implications for academic success gave a different result. Their study revealed that the cost of textbooks had a negative impact on their academic success, with 66% stating that they had not purchased a textbook because of its price and 47% indicating that not purchasing a textbook had negatively impacted their grade in a course.

Therefore, from the reviewed literature there is a clear indication that no research in Kenyan institutions of learning which has explored on the effects of the cost of revision materials as determinants of academic achievement in public primary schools in Kenya. Thus, this study seeks to fill this gap in research through the examination of the cost of revision materials as determinants of academic achievement in public primary schools in Kenya.

## **2.6 Summary**

From the literature review, determinants of pupils' performance have been the subject of ongoing research. There have been many studies that sought to examine this issue and their findings point out to culture, parents' educational background, occupational categories and income levels and self-motivation as socio-economic factors that have a significant effect on the pupil's performance. There are limited studies focusing on the effects of school levies on academic achievement in public day primary schools in Nyamira County. This study therefore intends to fill this gap.

The study of literature review reveals the concept of cost of education. Parental involvement in education in Kenya is mainly limited to financial contributions and teacher-parent meetings. Given the high cost of education and the need to improve quality of education, parental involvement is important.

It can be that despite the many researchers done on the subject little is known about the effects of motivational levies, remedial levies, examination levies and cost of revision books on academic achievement of class eight pupils in national examination. It is in this context that this research was designed to establish the effects of school levies on academic achievement in public primary schools and fill this gap.

Therefore this study provides an in-depth analysis of school levies as the factor that may provide a solution towards academic achievement in public day primary schools in Nyamira County.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter focuses on the research approach that was applied to address the study's objectives. It includes research design, location of the study, the study population, sample size and sampling procedures, research instruments, data collection, reliability and validity of the study and data analysis.

#### **3.2 Research Design**

According to Burns et al. (2003), a research design is a plan for carrying out a study with maximum control over aspects that may interfere with the validity of the findings. The research design guides the investigator in the various stages of the research (Nachamias et al., 1996). An ex post facto (causal comparative) research design was used for this investigation. An ex-post facto research design is described by Kerlinger et al. (2000), Cohen et al. (2000), and Marilyn et al. (2013) as a methodical, empirical investigation in which the researcher does not directly control independent variables because their manifestations have already happened or because they are not manipulative by nature. An ex-post facto research design, according to Lammers et al. (2005), is a non-experimental research technique wherein preexisting groups are compared on a dependent variable. Ex-post facto refers to "after the fact" in the context of social science and educational research (Cohen et al., 2000).

Because it enabled comparisons between two or more groups of people with comparable backgrounds who were exposed to various conditions as a result of their natural histories, this research design was considered beneficial for this particular study. In this regard, data on school levies were collected first, followed by data on school mean and school characteristics including pupils enrollment, year of registration, the sponsor of the school, learning materials, lunch program, physical location the school and staffing levels in quick succession. This research design was valuable in that it allowed the investigation of the influence of school levies on academic achievement in public day primary schools in Nyamira County. School levies and school's academic are independent and dependent variables that pre – exists and were not be subjected to any manipulation. Additionally, this research design was beneficial since it permitted exploratory adjustments to be made to the dependent variable in relation to the independent variable. Additionally, the design made it possible to gather data using a guide for documentary interpretation as well as a questionnaire.

### **3.3 Study Area**

The study was carried out in Nyamira County, one of the forty-seven counties in Kenya. Nyamira County covers an area of 899.4 km<sup>2</sup> and lies between 1,250 and 2,100 m (4,100 and 6,890 ft) above the sea level. Nyamira County borders the counties of Homabay to the north, Kisii to the west, Bomet to the south east and Kericho to the East. The county comprises five sub-counties: Nyamira, Nyamira North, Borabu, Manga and Masaba North. Borabu is the largest sub-county occupying an estimated area of 248 km<sup>2</sup> and Manga being the smallest with a land size of 111 km<sup>2</sup>. The table 1 shows the

administration and political units in Nyamira County. Table 1 indicate the administrative and political units in Nyamira County.

**Table 1: Administrative and Political Units**

Sub-county	Land area (km <sup>2</sup> )	No. of Divisions	No. of locations	No. of sub locations
Nyamira	179	2	7	19
Nyamira North	219.3	3	10	19
Borabu	248.3	3	5	11
Manga	111.3	3	7	22
Masaba North	141.5	3	9	19
Total	899.4	14	38	90

Source: Nyamira County Development Profile, 2019.

According to the 2019 population census, the county had a population of 605,576 (294,048 males and 311,328 female) with an average population density of 656 persons per km<sup>2</sup>. The researcher opted to carry out this study in Nyamira county first because majority of public day primary schools in the county charge school levies making the study important in examining the effect of school levies on academic achievement in public day schools in Nyamira County. It therefore, implies that, the evaluation of school levies as a way and a solution to improved academic achievement was appropriate in this region.

### 3.4 Study Population

According to De Vos (1998), the population refers to the people, events, organizational units or other sampling units with which the specific research problem is concerned. The study population in a research study can also refer to the target population. According to Borg et al., (2017), target population is a set of people, events or objects. As a result, everyone who represents the respondents being examined in any field of inquiry that makes up a universe or target population is included in the target population.

The 392 public day primary schools and their head teachers made up the study's population. Head teachers were targeted because they have a direct role to play, as executive officers of the management of schools and as government agents, in provision of all the necessary resources including teachers, in an attempt to ensure the smooth teaching – learning process. In addition, the head teachers are accountable for the academic performance of their own primary schools. The targeted schools and head teachers are provided in Table 2.

**Table 2: Targeted Public Day Primary Schools by Sub-county**

Sub-county	Targeted schools	Head Teachers
Nyamira South	89	89
Nyamira North	112	112
Borabu	64	64
Manga	63	63
Masaba North	64	64
Total	392	392

Source: Nyamira County Education Office, 2018

### **3.5 Sampling Techniques and Sample Size**

According to Kumar (2016), sampling is the process of choosing a small number of units from a larger group (the sampling population) to serve as the foundation for an estimate or prediction of a fact, circumstance, or result pertaining to the larger group. Accordingly, a sample is a subset of the population that is examined in an attempt to comprehend the population from which it was taken (De Vos, 1998). During the process of sampling, the investigator seeks knowledge or information about a whole population. It is helpful for research since it can save time and money by providing insight into a huge group by examining a small sample of its members (Orodho, 2012). Through sampling, a number of research participants were chosen to represent the broader population from which they were drawn. The sections 3.5.1 and 3.5.2, respectively, provide details on the sampling strategies and sample size that were employed for this investigation.

#### **3.5.1 Sampling Techniques**

Kasomo (2015) defines sampling as the process of choosing a specific number of participants from a research population or a defined population to serve as a representative sample of that community. A sampling technique is crucial because it uses data from a relatively small sample of that population to increase the likelihood that the results will be accurate and reliable (Oladipo et al., 2015).

A good sample should be representative enough to offer the features of the entire population, according to Mugenda et al. (2003). Stratified random sampling was used in this study to choose schools from each Sub-County, ensuring a representative sample. Specifically, the study population was divided into strata, or Sub-Counties. The researcher used a basic random sample technique to choose additional representative schools from each sub-county. The respondents from every sampling unit comprised of head teachers who were randomly selected from the sampled schools.

### 3.5.2 Sampling Design and Sample Size

The strategies and procedures to be used in choosing a sample from the target population as well as the estimation approach formula for calculating the sample statistics are referred to as sample design (Oladipo et al., 2015). Using Slovin's Formula (Sloniv, 1960), the study sample size was calculated as

:

$$n = N/1+Ne^2$$

Where:

n = Number of samples,

N = Total population and

e = is the margin of error to be decided by the researcher (the tolerance at a desired level of confidence, at 95% confidence level) or take 0.05

$$n = N/1+Ne^2$$

$$= \{392/ 1+392 \times 0.05^2\}$$

$$= 392/1.98$$

$$= 198 \text{ respondents}$$

Thus, the study sample size consisted of 198 public day primary schools. The 198 schools were chosen and distributed using a stratified random sampling technique to guarantee a fair representation of the study population. This ensured that the sample was proportionately and adequately distributed among the five Sub-Counties according to the population of Sub- County. By distributing the sample throughout the entire county, this ensured that all of the sub-counties were included in the study and that the socioeconomic dynamics of the area were taken into account. Table 3 displays the sample size.

**Table 3: Sample Size of Public Day Schools by Sub-county**

Sub-county	Targeted schools	Sample size
Nyamira South	89	45
Nyamira North	112	57
Borabu	64	32
Manga	63	32
Masaba North	64	32
Total	392	198

Source: Study Mapping Data, 2023

### 3.6 Research Instruments

Research instruments, according to Oso et al. (2008), are devices used to gather data for a specific study. This research constituted one group of respondents as indicated in the population of the study. The primary method of gathering data from the head teachers in this research study was a questionnaire. Further the researcher employed documentary analysis guide to supplement the questionnaire.

### **3.6.1 Head Teachers Questionnaire (HTQ)**

In order to gather information from the 198 head teachers that were sampled, a head teacher's questionnaire (HTQ) was created. According to Kiess et al. (1985), and Orodho (2012), the questionnaire was deemed suitable for this study due to its significant administration benefits, ability to present a consistent stimulus to a large number of participants at once, and ease of data collection for the investigation. According to Gay (1992), questionnaires allow respondents to freely express their ideas and opinions as well as offer suggestions. Based on these advantages, the questionnaire was decided to be appropriate for this research.

The questionnaire for head teachers was thoughtfully created to gather information from them regarding motivation levies, remedial levies, examination levies and the cost of textbooks and revision materials and academic achievement public day primary schools. Information on school enrollment, registration, the school sponsor, the presence of libraries in the schools, capitation grant data, school location, and head teacher background information were all requested in the head teacher's questionnaire.

### **3.6.3. Document Analysis Guide**

In order to gather information on staffing levels and the 2018 KCPE exam mean score results for elementary schools, a document analysis guide was also created. The documents considered for document analysis were the Kenya National Examination Council (KNEC) primary school KCPE consolidated mark sheets, internal and external examinations consolidated mark sheets and, the primary schools' green forms. The information obtained from the documentary analysis was used to supplement the information given by the head teachers.

### **3.7 Pilot Study**

According to Saunders et al., (2009), prior to using your questionnaire to collect data, it should be pilot tested.

Fifteen public day elementary schools in Nyamira County were chosen at random for the study. To take part in the pilot project, a purposeful sample of the head teachers of the sampled primary day schools was selected. When selecting schools to take part in the data generation for the study, the schools that were sampled for the pilot project were not included. To guarantee the validity and reliability of the head teachers' questionnaire, piloting was employed.

#### **3.7.1 Validity of the Research Instruments**

Validity, as defined by Kasomo (2015), is the degree to which a method or tool utilized in research is true, accurate, meaningful, and correct. Stated differently, validity refers to the extent to which findings derived from data analysis accurately depict the phenomenon being studied. According to Mugenda et al. (2003), a research study's quality is mostly determined by how accurately its data was collected. Orodho (2012) states that determining whether or not the questionnaire questions measure what is intended to be measured and whether or not they were clear is the goal of validity testing.

The supervisors who provided their knowledgeable advice on the designed research instruments examined the instruments to ensure validity. The researcher received input from the research supervisors after each one was assessed separately. Their recommendations were incorporated in the research instruments. The purpose of the pre-test was to determine whether the research instruments measured the intended outcomes

by administering the tests to fifteen public primary schools that were not part of the sampling schools. The supervisors made structural and phrasing changes to the questionnaire based on the pretest results. The document analysis guide's length and ambiguities were also taken into consideration when restructuring the tool. Data were then gathered using the revised head teacher questionnaire and the documentary analysis guide.

Supervisors who are knowledgeable in the field of study, as advised by Tichapondwa (2013), should carefully review questionnaire items to ensure they meet the necessary standards, including neutrality, clarity, and intelligibility.

To be more precise, the three approaches to validity—content, construct, and criterion-related validity—were examined in order to validate the study instruments

### **3.7.2 Reliability of Research Instruments**

Reliability, according to Oladipo et al. (2015), is the degree to which a measure produces consistent outcomes. If a measure or observation may be verified by another measurement or observation, that issue should be raised when evaluating dependability (Oladipo et al, 2015). The researcher used a test-retest technique to confirm the validity of the head teacher's questionnaire in order to determine the dependability of the instruments. The same questionnaire was administered to the 15 sampled head teachers within a span of two weeks under similar conditions. The first and the second responses from the head teachers were correlated yielding a Cronbach's coefficient of 0.7946. This

was higher than the set threshold of 0.7 (Borg and Gall, 1996). The head teacher's questionnaire was considered reliable (Amin, 2005).

### **3.8 Data Collection Procedures**

The researcher conducted this research in the last month of third term of the school's calendar in 2018. This was an appropriate time as much of the teaching-learning programs had been completed and just before the teachers were involved in the KCPE examinations administration and marking (usually taken in November of every year). Before collecting data for this study, the proposal was approved by the Directorate of Post Graduate Studies, Masinde Muliro University of Science and Technology. The researcher sought for a research permit from the National Council of Science, Technology and Innovation (NACOSTI). The NACOSTI permit was used by the researcher to request the County Director of Education, Nyamira County to authorize collection of data from the public day primary schools. After that, the researcher went to the schools to get information from the head teachers. When the researcher arrived at each sampled school, they informed the head teacher about the visit's goal and asked for permission to fill out the questionnaire and provide over the documents needed for document analysis. The head teachers' questionnaire was collected on the same day.

### **3.9 Ethical Considerations**

The fact that this study was looking into extremely delicate topics that can cause antagonism, insecurity, or participants hiding the true information needed from them made them aware of this. For the purpose of protecting the subjects' interests, confidentiality and privacy were therefore guaranteed. The participants, school

administrators, and pertinent authorities, such as the Ministry of Education, Science, and Technology (MOEST), were consulted in order to obtain permission to conduct the study.

It was entirely voluntary to participate. The participants were given a clear explanation of the research's goal by the researcher. Participants received an assurance from the researcher that any information collected for the study would be treated with strict secrecy. Participants had to be willing in order for them to make wise selections. The information gathered was kept private and utilized exclusively for this study. Every source is cited.

### **3.10 Data Analysis**

Forms were arranged and their completeness verified. The study data set was then created by coding and entering them into a computer utilizing an excel sheet. Version 4.2.1 of the R Project for Statistical Computing program was used to analyze the study's data. Multiple Linear Regression was used inferentially, together with descriptive statistics (mean, frequencies, and percentages) to evaluate the data gathered from the self-administered questionnaires and document analysis guide.

In particular, descriptive statistics (mean, frequencies, and percentages) were used to analyze the demographic characteristics of the respondents in Nyamira County, while Multiple Linear Regression was used to infer conclusions about the effects of motivation, remedial education, examination levies, and the cost of revision materials on academic achievements in public day primary schools. As a predictive analysis, multiple linear regression allowed the study to examine the direction and magnitude of each explanatory

variable's effect on the outcome variable while controlling for other variables, which is why it was determined to be appropriate for the research (Cohen et al., 2000). Table 4 presents a summary of the statistical analysis.

**Table 4: Summary of Data Analysis**

	<b>Objective/Hypothesis</b>	<b>Independent Variable</b>	<b>Dependent Variable</b>	<b>Statistical Test</b>
1	To establish the effect of school motivational levies on academic achievement in public day primary schools in Nyamira County Kenya.	School motivational levies	Academic achievement	Descriptive statistics Pearson Correlation Multiple Linear Regression
2	To establish the effect of school remedial levies on academic achievement in public day primary schools in Nyamira County Kenya.	School remedial levies	Academic achievement	Descriptive statistics Pearson Correlation Multiple Linear Regression
3	To determine the effect of school examination levies on academic achievement in public day primary schools in Nyamira County Kenya.	School examination levies	Academic achievement	Descriptive statistics Pearson Correlation Multiple Linear Regression
4	To determine the effect of cost of revision materials on academic achievement in public day primary schools in Nyamira County Kenya.	Cost of revision materials	Academic achievement	Descriptive statistics Pearson Correlation Multiple Linear Regression

Source the Author, 2023

## **CHAPTER FOUR**

### **PRESENTATION, INTERPRETATION AND DISCUSSION OF FINDINGS**

#### **4.1 Introduction**

To complete process of study properly, it is necessary to conduct and present an analysis of processed data from data collection instruments, collected from the field in order to test the hypotheses. As already indicated in preceding chapter, data collected from the field is processed and interpreted in a descriptive form using descriptive statistics and inferential statistics. Chapter four of this study deals with and comprises statistical data analysis, presentation and outcome interpretation and presenting the outcomes resulting from the statistical analysis and findings on how school levies affect the KCPE performance of pupils in their national examination. Specifically, this research was designed to answer four objectives. First, the study establishes effect of school motivational levies. Secondly, this study establishes effect of school remedial levies. Thirdly, this study determines effect of school examination levies. Lastly, this study determines effect of the cost of revision materials all this in relation of how the affected the class eight pupil's academic achievement in public day primary schools in Nyamira County Kenya. The survey's results and conclusions are presented as tables, graphs, and plots and are explained in relation to the goals.

#### **4.2 Descriptive Statistics of School Level Variables used in Analysis of Data**

This section presents an analysis of the school level variables (school characteristics, head teachers characteristics, teacher characteristics and the outcome variable (schools

KCPE mean scores) using statistical description for the analysis of the study data in section 4.2.1, 4.2.2, 4.2.3, and 4.2.4 respectively.

#### **4.2.1 School Characteristics**

Head of schools representing sampled schools, were asked to provide information on the school's sponsor by indicating on the questionnaire the primary school sponsor, the school library status, the class eight lunch program, the location of the school, the school age, school enrolment by gender, class 8 enrolment, amount of FPE funds received, and the number of class 8 streams. The statistical description for the school characteristics are exhibited in Table 5.

**Table 5: Descriptive Statistics for School Characteristics**

School characteristic ( <i>n</i> =198)	Categories	Frequency	Percent
School sponsor	DEB	99	50
	DOK	57	28.8
	SDA	19	9.6
	Others	23	11.6
	Total	198	100
School has a library	Yes	44	22.2
	No	154	77.8
	Total	198	100
School has a lunch program for class 8	Yes	94	47.5
	No	104	52.5
	Total	198	100
Location of school	Urban	4	2
	Semi-urban	30	15.2
	Rural	164	82.8
	Total	198	100
School characteristic ( <i>n</i> =198)	Range	Mean	Std. Dev.
School age	8 – 90 years	43.78	9.98
School enrolment by boys	53 – 458	166.49	65.49
School enrolment by girls	32 – 498	163.73	68.77
Total school enrolment	102 – 956	329.39	129.31
Class eight enrolment by boys	1 – 49	16.54	7.74
Class eight enrolment by girls	3 – 51	17.24	8
Total class eight enrolment	13 – 100	33.78	14.58
FPE funds received (Kshs)	0 – 1,357,520	465,365.56	186147
Number of class 8 streams	1 – 2	1.07	0.25

Key: Std. Dev = standard deviation; *n* = number of respondents.

Source: Survey Data, 2023

The descriptive statistics in Table 5 indicate 50% of public day primary schools in Nyamira County are sponsored by District Education Boards while close to 30% are

sponsored by the Catholic Diocese of Kisii (DOK). The Seventh-day Adventist church sponsors roughly 10% ( $n=19$ ) of the schools, the rest (12%) were patronised by a variety of churches, such as, PAG, ELCK, and COG.

The descriptive statistics further indicate that eight out of every ten schools in the county lacked a library ( $n=154$ , 78%) relative to only two schools out of every ten that had ( $n=44$ , 22%). Roughly, a half of the sampled schools (48%) run a lunch program for class 8 students while the rest (53%) do not. The largest number of schools were in rural areas (83%) relative to those found in semi-urban (15%) or urban areas (2%). The age of schools ranged from a minimum eight to a maximum 90 years in existence, yet from the analysis majority of schools had an average age of 44 years since they were established. Since the standard deviation for age was roughly 10 years, and assuming a Gaussian distribution (skewness=0.75 and kurtosis= 0.52) it implied that most of the schools were aged between 34 and 54 years. The results suggest that schools in the study area are relatively old. Nevertheless, since the study sampled schools with divergent ages, findings are likely to reflect the diversity, thereby, increasing the external validity of the study.

The total school enrolment ranged from a minimum of 102 to a maximum of 956 pupils with an average enrolment of 329 pupils. The standard deviation was 129 pupils, suggesting that enrolment in most schools was between 200 and 459 pupils. Given that a school has eight classes (standard 1 to 8), the results showed that the distribution of pupils in each class ranged between 25 ( $200/8$ ) and 57 ( $459/8$ ). The results showed that

most schools are quite small. This could be attributed to the fact that majority of the public day primary schools are most likely established in the rural set up.

The average class 8 enrolment was 34 pupils, ranging from a minimum 13 to a maximum 100 pupils. The standard deviation (15 pupils) was relatively small, suggesting that class 8 enrolment in most schools is quite small, ranging from 19 to 48 pupils. The average class 8 girls' enrolment was roughly equal to those of boys (both 17 pupils).

Free primary education funds received by schools ranged from zero to Kshs 1 357 520, with a mean of Kshs 465 365.56. Since the standard deviation for FPE was roughly Kshs 186,147, and assuming a normal distribution (skewness=0.98 and kurtosis= 2.36) it implied that most of the sampled schools receive between Kshs 279, 218.31 and Kshs 651 512.81 for free primary education. The number of class 8 streams ranged from one to a maximum of two streams, with an average of 2 streams. This finding validated the conclusion that classes in the sampled schools were relatively small.

#### **4.2.2. Head Teacher Characteristics**

The descriptive statistics for head teachers' characteristics in relation to their gender, current grade, age, and length of service is displayed in Table 6.

**Table 6: Descriptive Statistics for Head Teacher’s Characteristics**

Head teacher’s characteristic ( <i>n</i> =198)	Categories	Frequency	Percent
Gender	Male	158	79.8
	Female	40	20.2
	Total	198	100
Current grade/scale	10	159	80.3
	11	39	19.7
	Total	198	100
Head teacher’s characteristic ( <i>n</i> =198)	Range	Mean	Std. Dev.
Age (years)	40 – 60	52.1	4.57
Years of service	3 – 39	22.87	5.61

Key: Std. Dev = standard deviation; *n* = number of respondents.

Source: Survey data, 2023.

Table 6: Shows that the response rate for the study was 100% as all the 198 head teachers sampled responded to the questionnaire. Further the outcome displayed in Table 6 demonstrates that, most of the school heads were male ( $n=158$ , 80%) relative to females ( $n=40$ , 20%). This confirms the finding of the study done by Nyamongo (2012), that higher number of schools that is, 22 schools was headed by male teachers while only 7 of the sampled schools in Nyamira District Nyamira county were headed by female teachers. This indicated that there was an imbalance gender distribution in the headship of primary school level in Nyamira County. Nevertheless, given that both genders were sampled, the external validity of the study’s findings was ensured. Eight out of every ten head teachers (80%) were on scale 10 (designated head teacher) compared to only two head teachers out of every ten (20%) who were on grade 11 (senior head teacher). The results showed that majority of heads of schools were on a junior scale. The head teachers scale enables the school heads to respond from a well-informed point of view of aspects related to school finances and school levies in day primary school.

The findings showed that the youngest school head was 40 years old while the oldest was 60 years, with an average age of 52 years. The standard deviation (5 years) was quite small, indicating that most head teachers age ranged between 48 and 57 years. The results suggest that a good number of school heads in Nyamira county were middle-aged. The average years of service for head teachers was 23 years, ranging from just three years to a maximum of 39 years. The standard deviation for years of service was roughly 6 years, and assuming a Gaussian distribution (skewness= -0.52 and kurtosis= 2.46), it implied that most of the head teachers' years of service were between 17 and 28 years. The outcome of this research imply that head teachers in Nyamira County had served for a reasonable period in teaching and therefore they have a wealth of experience hence the are well informed to provide seasoned responses with regards to the various school levies in the public day primary schools.

#### **4.2.3 Teacher Characteristics**

School heads in the sampled schools were asked to indicate on the documentary analysis guide, the age of the teachers, that is total years a teacher has taught since the date of deployment as a TSC teacher. Further the school heads were required to state the full length of time in terms of years a teacher has taught in the sampled school and years of schooling. The descriptive statistics of teachers' characteristics are displayed in Table 7.

**Table 7: Descriptive Statistics for Teacher Characteristics**

Staff characteristics ( <i>n</i> =198)	Range	Mean	Std. Dev.	Skewness	Kurtosis
Mean age	39.75 – 52.61	45.67	2.5	0.48	0.05
Total years teachers have taught since appointment	5.13 – 26.47	14.87	3.75	0.17	0.124
Years teachers have taught in the school	1.80 – 13.50	6.85	2.28	0.35	-0.2
Years of professional training	14 – 15	14.3	0.21	-0.04	-1.22

Key: Std. Dev = standard deviation; n = number of respondents

Source: Survey data, 2023

Table 7: From the table, the results shows that the age of teacher in average in the sampled schools were 46 years, which ranged between 40 and 53 years. The standard deviation was small (2.50), showing that the mean age of the teachers was close to 46 years. The small values of skewness (0.48) and kurtosis (0.05) suggested that the distribution of mean ages was roughly normal. This was expected since this was a distribution of means, rather than of original values. The mean teaching experience of teachers was 15 years, with a small standard deviation of just four years. This suggest that teachers of the sampled schools had taught for a considerable period. However, their mean teaching experience was less than that of the head teachers, as expected, who had 23 years teaching experience.

Most teachers had taught in the school for approximately 7 years. Given the small standard deviation (2.28), the results suggest that most teachers had taught in the school for around 7 years. Years of teachers' professional training as exhibited from the outcome lied between 14 years to 15 years, with an average of roughly 14 years. Considering that the number of years required to train a graduate is 16 years, the results

showed that all the teachers in the study were either certificate or diploma holders. Given that the mean was 14.30, the results suggest that most teachers of the sampled schools were certificate holders.

#### 4.2.4 Sampled Primary Schools KCPE Mean Score

Each primary day school was required to indicate their KCPE mean score for the 2018 KCPE examination. The descriptive statistics are summarised in Figure 2.

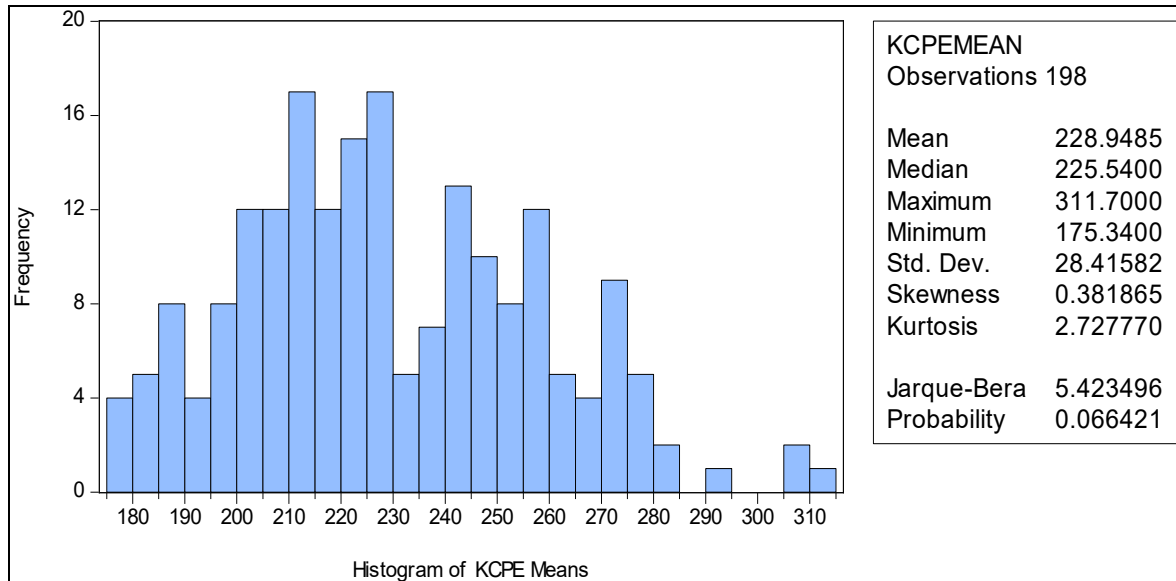


Figure 2: School KCPE Performance

Source: R Project Output, 2023

The KCPE means in public schools in Nyamira County in Figure 2 ranged from a minimum of 175.34 to a maximum of 311.70, with an average mean 228.95. The results showed that performance in most schools was relatively poor. The standard deviation (28.42) was small and assuming a Gaussian distribution, the results showed that most schools' means occurred between 200.53 and 257.36, which buttressed the conclusion

that performance in most public schools was average. Skewness (0.38) and kurtosis (2.72) were either within or close to the benchmark  $\pm 2$ , which showed that the data was normal, a finding supported by the shape of the histogram did not greatly depart from normality. Furthermore, the  $JB=5.42$ ,  $p=0.07$  means that these results exhibit normality in the distribution of KCPE mean scores. From this kind of distribution, the test's null hypothesis was accepted. Thus, distribution of school means was normally distributed. The school KCPE mean score is the outcome variable and is used in the analysis of study objectives presented in section 4.3, 4.4, 4.5, and 4.5.

### **4.3 The Effect of School Motivational Levies on Academic Achievement in Public Day Primary Schools in Nyamira County**

This section presents an analysis of objective one of the research survey which was primarily designed to establish to what extent school motivational levies affected class eight learners KCPE examinations. This research therefore, modelled effect of motivational levies on learners using multiple linear regression analysis. To achieve this objective, this research study first conducted univariate analysis (standard deviations, kurtosis, skewness, and means) for the school motivational levies (academic tours, teachers' motivation, and pupils' motivation) in order to describe the constructs of school motivational levies. The results are presented in section presented in section 4.3.1.

Secondly, the study ran a pair wise correlation to establish which school motivational levies constructs (academic tours, teachers' motivation, and pupils' motivation) and head teacher characteristics were correlated with the outcome variable (school KCPE mean score). The results of the bivariate statistics are presented in section 4.3.2. Before fitting the multiple linear regression, the study conducted model diagnostic test for the

assumptions of multiple regression analysis for testing objective one. The results of the model diagnostic test are presented in sections 4.3.3. The study then fitted a multiple linear regression model so as to test and find out the effect of school motivational levies and how they affect the pupil's achievements in academics in primary schools while in the same time controlling for head teachers' characteristics. The outcome from the multiple regression analysis are demonstrated in section 4.3.4. Finally, after multiple linear regression analysis, the study tested null hypothesis that school motivational levies have no statistically significant effect on academic achievement. The results are presented in section 4.3.5.

#### **4.3.1 Univariate Statistics for School Motivational Levies**

The study sought data from the primary school head teachers on the total monies solicited from class eight parents to support the school academic tours, teachers' motivation, and pupils' motivation. The descriptive statistics for monies spent on school academic tours, teachers' motivation, and pupils' motivation are presented in sections 4.3.1.1, 4.3.1.2, and 4.3.1.3 respectively.

##### **4.3.1.1 Univariate Statistics for School Academic Tour Levies**

This section presents the data analysis from the school head teachers on the total monies collected from parents towards school academic tours. The results are presented in Figure

3.

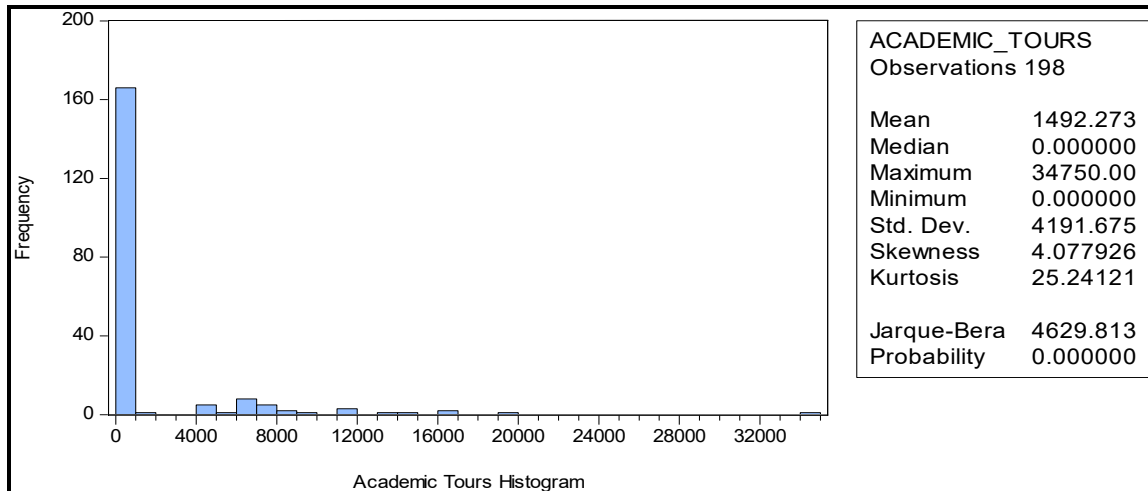


Figure 3: Summary Statistics and Histogram of School Academic Tours

Source: R Project Output, 2023

It can be observed from Figure 3 that academic tours levies ranged from a minimum of zero to a maximum of Kshs 34, 759 with a mean of Kshs 1,492.27. Although only observed in a few cases, the observation that schools could ask for as much as Kshs 34,000 for academic tours appears exorbitant. Kihura (2015) observed that since the government banned holiday tuition, owners and managers of schools, especially private ones, had discovered a new ‘cash cow’ for making money. Unfortunately, teachers are not usually the primary beneficiaries of these trips. The frequency of zero contributions was 166 (83.8%), which showed that most schools do not collect academic tours levies from parents. This conclusion is supported by the value of median, which was zero. The standard deviation (Kshs 4,191.68) was very large (larger than the mean), indicating the existence of wide variances between schools in their collection of academic tours levies. The skewness (4.08) was positive, indicating a skew to the right, that is, most data values were zero. Kurtosis (25.24) was large and positive, indicating leptokurtosis in the data, this can be argued that, there are more items that’s the amount of tour levies near the

values the comprise the mean and towards the tail but the items are fewer in the intermediate regions (Norusis, 2010). Given that skewness and kurtosis values were outside the benchmark  $\pm 2.0$  (Field, 2013), the results indicated that the distribution of academic tours was non-normal. This conclusion was buttressed by results from the more explicit test for normality, *JB* (Jarque-Bera) = 4629.81,  $p < 0.0001$ . The data should be regularly distributed for analysis and the null hypothesis test. In the case of this findings, the results showed that the hypothesis was rejected and hence the distribution of academic tours was deemed non-normal.

#### **4.3.1.2 Univariate Statistics for Teachers Motivation Levies**

This section of the study presents the data that was sought from the school heads concerning the total amount of monies collected from parents to support the teacher motivation program. The results are presented in Figure 4.

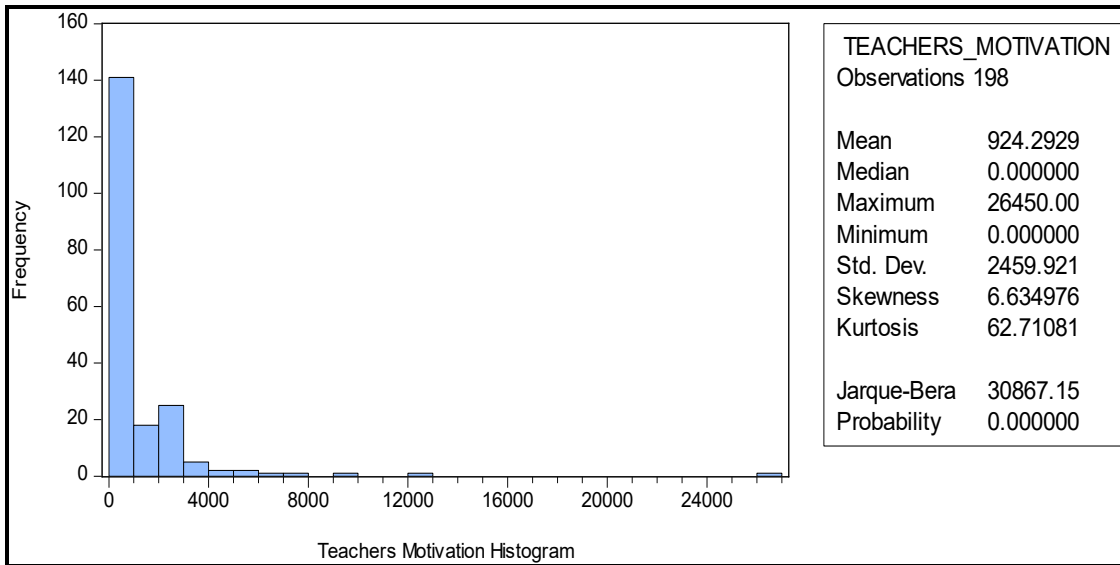


Figure 4: Summary Statistics and Histogram of Teacher’s Motivation Levies

Source: R Project Output, 2023

The data from Figure 4 indicate that the average teacher’s motivation levy was Kshs 924.30 and it ranged from a minimum of zero to a maximum of Kshs 26,450. A predominant number of head teachers ( $n=139$ , 70.2%) answered that their schools never collect levies for motivation of teachers. The median was zero, which supported this conclusion. The standard deviation was very large (Kshs 2,459.92) and greater than the mean, showing a wide disparity in the collection of teacher motivation levies amongst the schools. Most data values were less than the mean, as skewness (6.63) was positive. In addition, the distribution was leptokurtic, since kurtosis was large and positive (62.71). The  $JB = 30867.55$ ,  $p < 0.0001$ , indicated non-normality in the distribution.

#### 4.3.1.3 Univariate Statistics for Pupils Motivation Levies

Concerning pupils’ motivational levies, this research study sought data from the school head masters, on the total monies collected from parents to support the pupils’ motivation program. The results are presented in Figure 5.

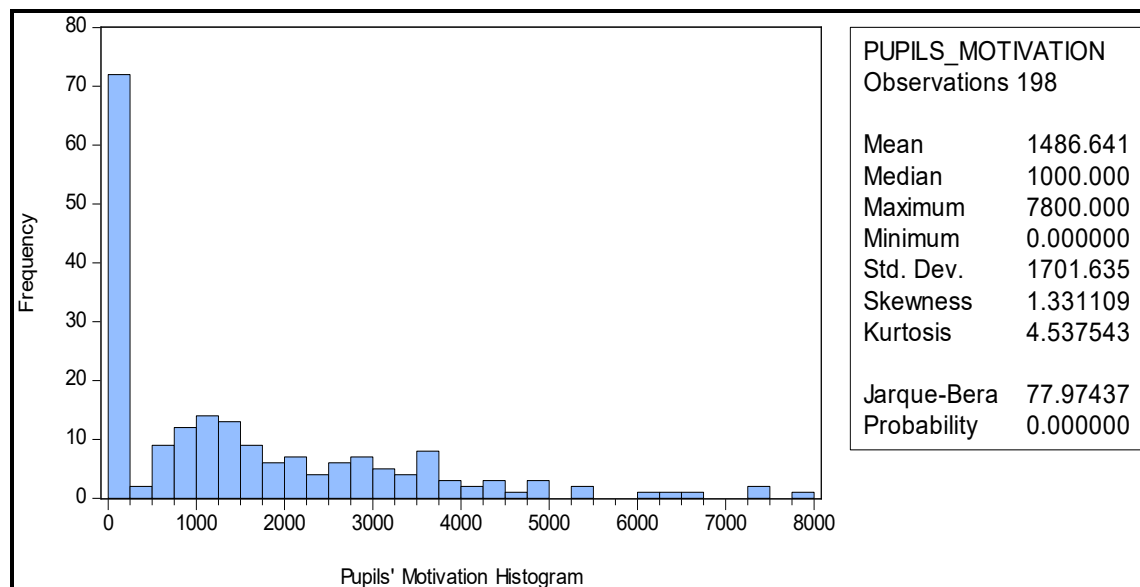


Figure 5: Summary Statistics and Histogram of Pupil’s Motivation Levies

Source: R Project Output, 2023

Data from Figure 5 indicate that the mean pupils' motivation levy was Kshs 1,486.64 and it ranged from a minimum of zero to a maximum of Kshs 7,800. Head teachers from 72 schools (36%) answered that their schools did not collect levies for motivation of pupils. Hence, two-thirds of the schools ( $n=126$ , 64%) collect pupils motivation levy. The median was Kshs 1,000, supporting the finding that most schools collect pupil motivation levies. The standard deviation was Kshs 1,702, showing that most schools collect between zero and Kshs 3,188 for motivating pupils. Although, the  $JB = 77.97$ ,  $p < 0.0001$ , indicated non-normality, the skewness (1.33) and kurtosis (4.54) were either within or close to the benchmark  $\pm 2$ . This outcome depicted clearly from the graphical presentation that the distribution of pupil's motivational levies is not normally distributed although to some extent as presented in figure 8 the data is far from most basic normality.

School motivational levies constructs (academic tours, teachers' motivation, and pupils' motivation) as explanatory variables and are modelled to establish their effect on school academic performance in KCPE using the inferential statics of Linear Multiple Regression analysis. Section 4.3.2 presents the findings.

#### **4.3.2 Bivariate Statistics for School Motivational Levies and Control Variables**

To carry out a bivariate analysis, it requires one to ensure that the Multiple Linear Regression Model has been fitted as required. Therefore, to be able to statistically fit Multiple Linear Regression Model, this research study ran two pair-wise correlations. First, the research study ran a Pearson's Correlation Coefficient,  $r$  to establish which school motivational levies constructs (academic tours, teachers' motivation, and pupils'

motivation) were correlated with the outcome variable (school KCPE mean score) in order to establish which variable constructs to pursue in the regression model. This is because according to Field (2005), in the field of statistics, correlation coefficients with an absolute value less than 0.35 are commonly recognized as good indicators of low or weak correlations, moderate correlations between 0.36 and 0.67, strong or high correlations between 0.68 and 1.0, and extremely high correlations with  $r$  coefficients greater than 0.90. The results for bivariate analysis are presented as shown in the Table 8.

**Table 8: Correlations between School KCPE Mean and School Motivation Levies**

Variable (n = 198)		KCPE means	Academic tours	Teachers' motivation	Pupils' motivation
KCPE means	<i>R</i>	1			
Academic tours	<i>R</i>	0.076	1		
Teachers' motivation	<i>R</i>	0.04	0.145*	1	
Pupils' motivation	<i>R</i>	0.160*	0.144*	0.472**	1

Key:  $r$  = Pearson correlation coefficient; \*\*, \* = correlation significant at .01 and .05 levels (2-tailed), respectively.

Source: R Project Output, 2023

The outcome of the statistical analysis in Table 8 shows correlations between school KCPE mean and motivational levies. It is evident from table 8 that, the correlations exhibit statistically significant, positive but weak correlation between KCPE mean score and pupils' motivation ( $r=0.160$ ,  $p=0.024$ ). The relationship was positive which showed that when pupils' motivation increases, their academic achievement also increases and vice versa. Nevertheless, from bivariate analysis, the study failed to find statistically significant relationships between academic tours ( $r=0.076$ ,  $p=0.287$ ) and teachers' motivation ( $r=0.040$ ,  $p=0.576$ ) with KCPE means. The results from the analysis suggested that an increase in academic tours or teachers' motivation is not correlated with

improved pupil academic achievement. The relationship between pupils' and teachers' motivation was found to be statistically positive, significant and moderate ( $r=0.472$ ,  $p<0.0001$ ), suggesting that schools that collect teachers' motivation levies are also likely to levy pupils' motivation monies.

Secondly, the study ran a Pearson's Correlation Coefficient,  $r$  to establish which control variables were correlated with the outcome variable (school KCPE mean score) in order to pursue regression model. The findings in table 8 depicts are further presented in Appendix 11. shows that of twelve (12) control variables only four (head teachers' sex, teachers mean age, teachers mean experience and, teachers' years of schooling) were correlated with school KCPE mean score hence were pursued in the regression analysis.

#### **4.3.3 Model Diagnostic Testing for Multivariate Analysis of the Effect of School Motivational Levies on School Academic Achievement**

The purpose of this study was to determine whether the data for the first objective satisfied the multiple linear regression model's assumptions. The study conducted several diagnostic tests statistics to established whether the multiple regression model's assumptions were satisfied by the data for objective one. The statistical analysis included linearity, normality, homoscedasticity, and test for outlier's presence to ensure the validity of the results. According to Chatterjee et al., (2012), the diagnostic tests that are conducted for core assumptions of OLS include linearity, which analyses data to ascertain linearity. Equally, according to Green, (2008), other diagnostic tests that are conducted for core assumptions of OLS are tests of disturbances (errors/residuals) with similar variance (homoscedastic) which are not in any way related with one another (non-auto correlated). Finally, the other diagnostic tests that are conducted for core

assumptions of OLS according to Green (2008), is the test of multicollinearity, which seeks to establish whether there is no multicollinearity. Therefore, the outcomes for diagnostic tests statistics for linearity, homoscedasticity of the residuals, multicollinearity, and autocorrelation are presented in sections 4.3.3.1, 4.3.3.2, 4.3.3.3, and 4.3.3.4 respectively

#### **4.3.3.1 Linearity**

The following scatterplot predicting KCPE mean from academic tours and a further Lowess Smoother is exhibited in Figure 6.

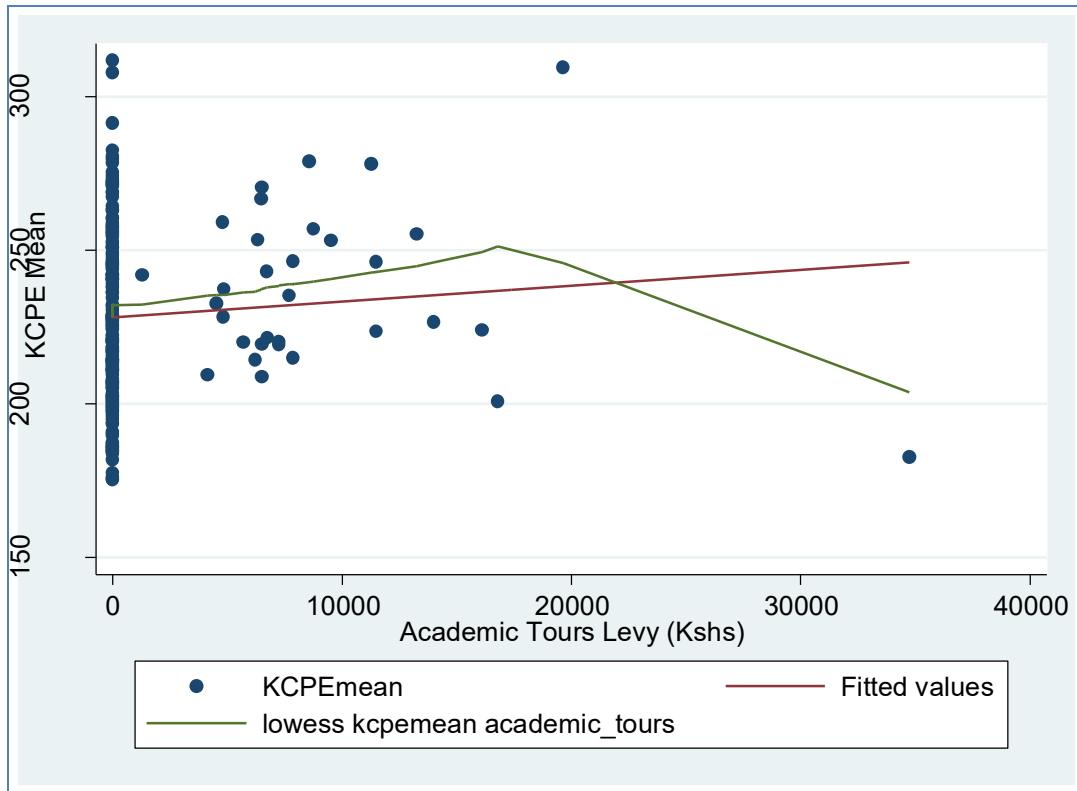


Figure 6: Scatterplot of KCPE mean and academic tours levies

Source: R Project Output, 2023

Figure 6 presents results from the lowess (loess) curve shows a kink, suggesting some nonlinearity exists in the data presented for analysis.

In the next scatter plot, the scatterplot seeks to predict KCPE mean from teachers' motivation exhibited in the Figure 7.

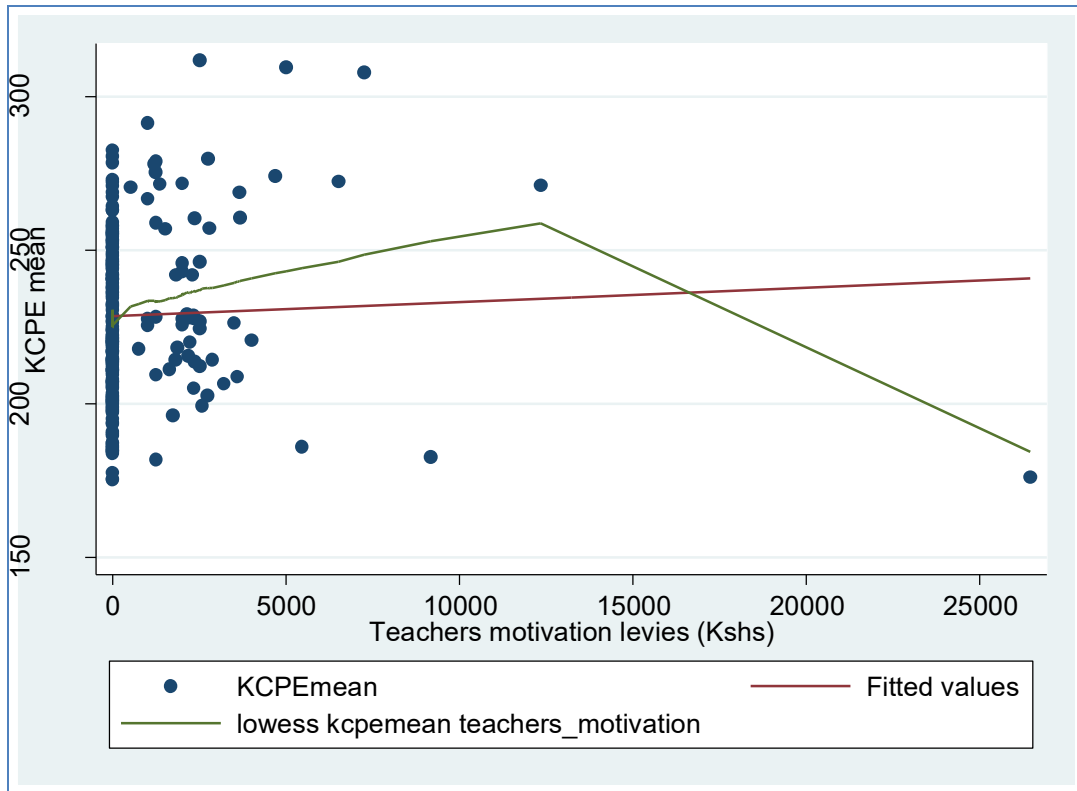


Figure 7: Scatterplot of KCPE Mean and Teachers' Motivation levies

Source: R Project Output, 2023

Figure 7: Shows the results from the lowess (loess) curve, which shows a kink, suggesting some nonlinearity in the data presented on KCPE Mean and Teachers' Motivation levies.

The following is a scatterplot predicting KCPE mean from pupils' motivation and a lowess smoother in the Figure 8.

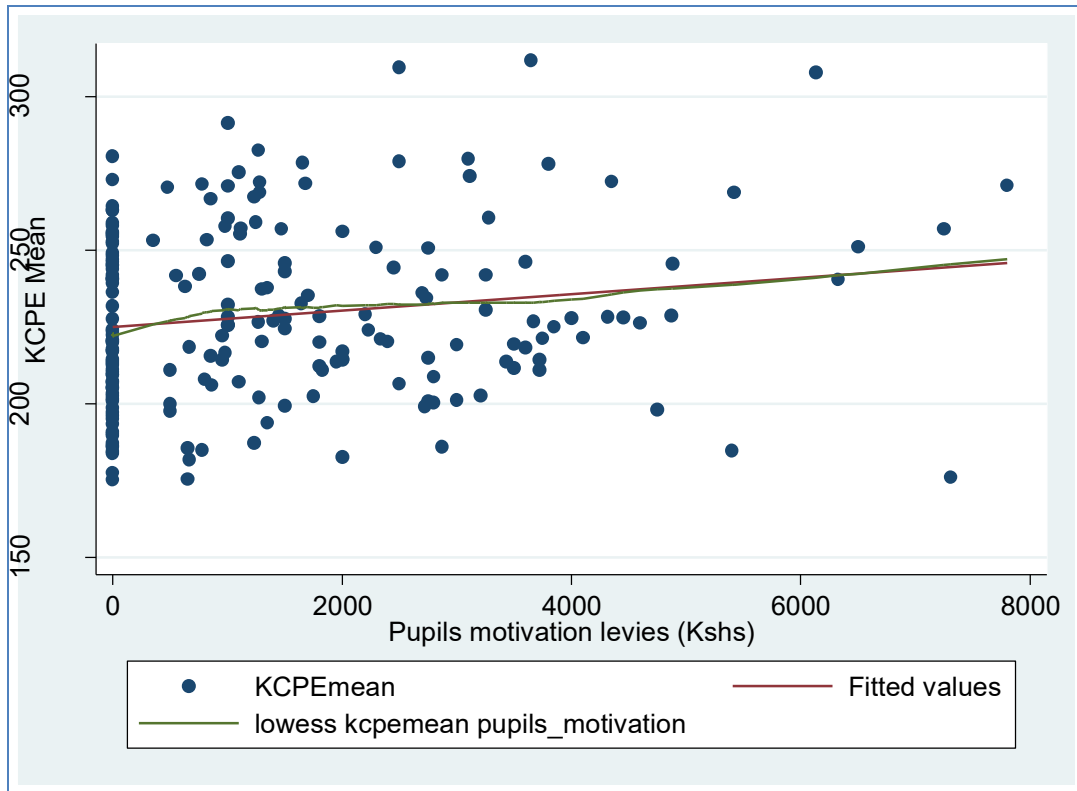


Figure 8: Scatterplot of KCPE Mean and Pupils' Motivation Levies

Source: R Project Output, 2023

Results of Figure 8 show that both the loess and fitted values curves were linear, with no kink, suggesting linearity in the data presented for statistical analysis.

#### 4.3.3.2 Homoscedasticity of the Residuals

In this section, figure 9 presents a figure showing a plotting of homoscedasticity of the residuals against values fitted (predicted) for data analysis.

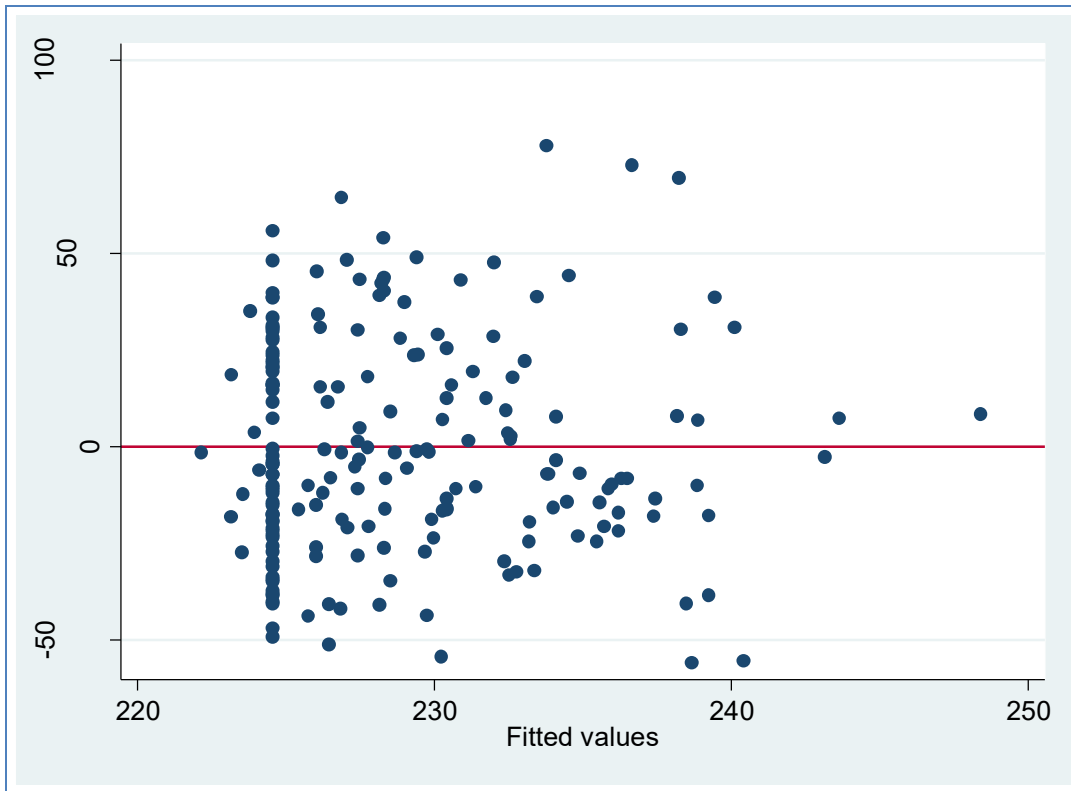


Figure 9: Plot of Residuals versus Fitted Values for Motivation Variables

Source: R Project Output, 2023

Figure 9 Presents the outcome of data analysis indicating the distribution of residuals for Multiple Linear Regression model. Figure 9 shows that the residuals are haphazardly dispersed about the zero-center line, showing no clear pattern. The outcomes of data analysis indicate that errors or residuals are roughly normally distributed, have a constant variance (homoscedasticity), and are not connected with one another (non-autocorrelated). Results from graphical test was supported by the more explicit Breusch-Pagan Test,  $\chi^2(1) = 0.69, p=0.4076$ , which showed that the null hypothesis of constant variance in the residuals was accepted. Thus, residuals had homogenous variance.

### 4.3.3.3 Multicollinearity

In this section of the study, dealt with the statistical analysis of data to test for multicollinearity. Table 9 displays the Multiple Linear Regression's Variance Inflation Factor (VIF) and Tolerance (1/VIF) values.

**Table 9: Multicollinearity Statistics for School Motivation Levies**

Variable	VIF	1/VIF
Academic tours	1.03	0.972
Teachers' motivation	1.3	0.771
Pupils' motivation	1.3	0.771
Mean VIF	1.21	

Key: VIF=Variance Inflation Factor

Source: R Project Output, 2023

With tolerance values ranging from 0.77 to 0.97 for each predictor variable, it appears that multicollinearity may not have been an issue. Thus, the findings suggest that none of the three variables—academic tour levies, teacher motivation levies, and student motivation levies—was a linear combination of other predictor factors. In data analysis, VIF merely provides an alternative mathematical representation of tolerance. Ultimately, Table 9 demonstrated that multicollinearity was not likely to be an issue by showing positive but moderate or weak correlations among the independents (minimum = 0.144, maximum = 0.472).

#### **4.3.3.4 Autocorrelation**

The viability of the independent error assumption is demonstrated by the Durbin-Watson statistic. It was 1.964 in this model, indicating the independence of the mistakes

#### **4.3.4 Multivariate Analysis for the Effect of School Motivational Levies on Academic Achievement in Public Day Primary Schools in Nyamira County**

This study used two models to model the effect of school motivation levies on academic achievement in public day primary schools in Nyamira County. In model 1, the study assesses the effect of school motivation levies on academic achievement in public day primary schools. In model 2, the study assesses the effect of school motivation levies on academic achievement in public day primary schools while controlling for head teachers characteristics.

The aggregate mean points in KCPE are shown by the coefficient's value in the model. The coefficient's positive and negative indications correspond to rising and falling school aggregate points in the KCPE, respectively. Testing at  $p=0.05$  determines the significance of the association between a particular explanatory variable and the school mean score in the KCPE. Table 10 displays the findings of a multiple regression analysis examining the impact of school motivation levies on academic achievement in public day primary schools.

**Table 10: Multiple Linear Regression Results for the Effect of School Motivational Levies on School Academic Achievement**

Variable ( <i>n</i> =198)	Model 1				Model 2			
	<i>B</i>	$\beta$	<i>t</i>	<i>P</i>	<i>B</i>	<i>B</i>	<i>T</i>	<i>p</i>
(Constant)	224.54		82.94	0.000	338.95		6.56	0.000
Academic tours	0.0004	0.0582	0.81	0.418	0.0003	0.045	0.64	0.52
Teachers' motivation	-0.0006	-0.052	-0.64	0.522	-0.0007	-0.064	-0.82	0.414
Pupils' motivation	0.0029	0.1759	2.19	0.03	0.0036	0.2196	2.75	0.007
Control Variables								
Sex_2					10.371	0.1469	2.09	0.038
Mean age					-2.6912	-0.228	-2.17	0.031
Mean experience					0.7221	0.0578	0.56	0.577
Training years					-0.2826	-0.022	-0.32	0.75
<i>R</i> <sup>2</sup>		0.0305				0.0898		
Adjusted <i>R</i> <sup>2</sup>		0.0155				0.0563		
<i>F</i> Change		2.036				2.69		
<i>P</i>		0.1102				0.011		

Key: *B*= b coefficient (unstandardized),  $\beta$  = Beta (standardized coefficient)

Source: R Project Output, 2023

In the first model in Table 10, the  $R^2$  was found to be 0.0305, which means that academic tours, teachers' and pupils' motivation could jointly explain just about 3% of the variation in schools' academic achievement. It is stated, according to Field (2005), that while  $R^2$  values greater than 40% are regarded as high, this model could explain very little variance in academic achievement, suggesting that motivation levies do not seem to affect schools' academic achievement by a greater degree.

In the first model, when academic tours, teachers' and pupils' motivational levies were entered, the effect of the change was not significant,  $F(3, 194) = 2.04$ ,  $p=0.110$ , indicating that there was no substantial correlation between the three variables and academic achievement in schools. In the second model, when some control variables were added, the effect of the change was significant,  $F(7, 190) = 2.68$ ,  $p=0.011$ , with R

square increasing to 0.0898. This showed that other variables, such as head teachers' mean age, gender, and experience, could affect schools academic achievement.

Adjusted R Square, according to Weber et al. (1970), tells us how well a model can be applied to the broader population. Consequently, the second model would have explained around 6% of the variance in the dependent variable if it had been obtained from the population as opposed to the sample.

According to Weber et al. (1970), the partial regression coefficient, also known as the B coefficient, represents each predictor's unique contribution to the model. Additionally, Weber et al. (1970) state that a variable's partial coefficient indicates how much the value of the dependent variable changes when the independent variable's value increases by one while holding the values of the other independent variables constant. When the value of the independent variable rises, the dependent variable's anticipated value rises as well, according to a positive coefficient. The partial regression coefficient for students' motivation in the final model (model 2) ( $b=0.0037$ ,  $t=2.75$ ,  $p=0.007$ ) was statistically significant. However, the regression coefficients for academic tours ( $b=0.0003$ ,  $t=0.64$ ,  $p=0.520$ ) and teachers' motivation ( $b= -0.0007$ ,  $t= -0.82$ ,  $p=0.414$ ) were not statistically significant at  $p<.05$ . Thus, while student motivation has a big impact on academic accomplishment in schools, the study revealed no proof that teacher motivation or academic tours boost academic achievement in schools.

The coefficient of the pupils' motivation was positive, indicating that schools academic achievement likely improves whenever there is an increase in pupils' motivation, *ceteris paribus*. The coefficient for pupils' motivation levy was 0.004, which means an increase

in the levy by one Kenya shilling these results to an improvement in the KCPE mean scores by 0.004 points or by 0.0016% (coefficient of determination =  $r^2 = 0.004^2$ ). Which confirms the study by Auwalu et al (2021), that dealt with how motivation led to students' academic performance in University of Sultan Zainal Abidin Students, which showed that there is a significant positive link between academic achievement and motivation among University Sultan Zainal Abidin students based on the calculated results of the correlation study. The value of the computed r was found to be  $r = 0.667$  at  $p = 0.000$ ,  $p < 0.05$  level of significance. Academic accomplishment of University Sultan Zainal Abidin students was shown to have a strong association with motivation, as indicated by the derived correlation value of 0.667. The result suggests that, for any increase in students' motivation, there will be a positive improvement in their academic performance (GPA). In other studies, by Nyamongo (2012), Reche et al. (2012), Yego (2013), Oyugi (2014), Asiago et al (2018) and Nyawanda (2019), who established positive relationship between motivation and academic achievement also support the conclusion that motivation of pupils has a significant effect on their performance.

Further, when control variables were added into the regression model to determine whether they could be potential confounding factors and therefore, help to delineate the exact effect of motivational variables on schools' academic achievement. Nominal variables were dummy coded before being used in regression analysis. School characteristics (total class eight enrolment, number of class eight streams, presence of library in schools, existence of a lunch program for pupils, location of the school, and the type of sponsor) were included in the model and were found not to be significant (Appendix 11). As a result, they were eliminated from the multiple linear regression

model's final version. The study's findings showed that student motivation is a strong indicator of student accomplishment, regardless the sponsorship in school, class eight enrolment, number of class eight streams, presence of library in schools, existence of a lunch program for pupils, and location of the school. This similarly upholds the argument by Adipo (2015), students must be exposed to some kind of stimulation in order to learn at any level.

In addition to student motivation, the study's results showed that the gender of the head teacher ( $b=10.37$ ,  $t=2.09$ ,  $p=0.038$ ) and the average age of instructors ( $b=-2.591$ ,  $t=-2.17$ ,  $p=0.031$ ) had a substantial impact on academic accomplishment in the school. The results suggest that compared to male head teachers (reference category), female head teachers attain on average mean scores of roughly 10 points more than male heads. In contrast, schools' academic achievement drops by roughly 2.59 points (7%), for every year that the average age of a teacher increase. The results indicate that generally female head teachers and younger teachers are better at improving schools' academic achievement.

The units of measurement of the variables have no bearing on the conventional partial regression coefficients, which are also referred to as beta weights, b-primes, and coefficients of determination. Instead, they are all expressed in standard deviation units. The benefit of using standard partial regression coefficients is that their values may be readily compared to illustrate the relative standardized strengths of the effects of multiple independent variables on a single dependent variable. The primary influence with the largest magnitude is the beta coefficient of students' motivation ( $\beta = 0.219$ ). If all other X variables are held constant, the rate of change in Y standard deviation units per one X standard deviation unit is given by a standardized partial regression coefficient. For

instance, *ceteris paribus*, an increase in a student motivation levy of one standard deviation will result in an improvement in academic achievement in schools of about 0.219 of its standard deviation.

#### **4.3.5 Testing the Null Hypothesis that School Motivational Levies have no Statistically Significant Effect on Academic Achievement in Public Day Primary Schools in Nyamira County, Kenya.**

T-tests were employed in the research hypotheses for this goal in order to evaluate the hypothesis as presented in different regression analyses. In terms of student motivation, the B coefficient ( $b=0.0037$ ,  $t=2.75$ ,  $p=0.007$ ) was statistically significant. From this outcome, it was evident that there was an unlikelihood that the results of the population  $B$  coefficient for motivational levies was zero. Thus, null hypothesis for school motivational levies that; school motivational levies have no statistically significant effect on academic achievement in public day primary schools in Nyamira County Kenya was rejected and the alternative hypothesis that; school motivational levies have statistically significant effect on academic achievement in public day primary schools in Nyamira County Kenya. was accepted. This is because the computed value of  $t$  for the pupil's motivation was 2.75 which is more than the critical value of  $t$ . However, the regression coefficients for academic tours ( $b=0.0003$ ,  $t=0.64$ ,  $p=0.520$ ) and teachers' motivation ( $b=-0.0007$ ,  $t=-0.82$ ,  $p=0.414$ ) were not statistically significant at  $p<.05$ . Thus, while motivation of pupils has a significant effect on schools academic achievement, the study found no evidence that academic tours and teachers' motivation lead to improved

performance.

These findings are consistent with those of Asiago et al.'s (2018) investigation of the impact of educational funding on students' academic performance on the Kenya Certificate of Secondary Education Examination (KCSE) in Kenyan public secondary schools. Regression model  $Y=a+bX$  was used in the study, where Y is the dependent variable (KCSE mean score), a-is the regression equation's constant, b is the value of the independent variable's coefficient, and X is the independent variable's value. In this instance, the financial resources of the school were the independent variable. The regression analysis equation is thus created. Y is equal to  $2.04 + 1.820$  times school funding. This suggests that the KCSE mean score rises by 1.82 units for every unit increase in school financial resources. Consequently, the higher the school's KCSE mean score, the more sufficient the financial resources are. The association between the school's financial resources and KCSE mean score is very significant, as evidenced by the  $p < 0.001$  value. The fact that  $R^2=0.111$  suggested that school financial resources predicted the KCSE mean score by 11.1 percent was also implied. Consequently, the research has demonstrated a statistically significant correlation between the financial resources of schools and their KCSE mean score.

The coefficient for the students' motivation levy (0.004) demonstrated that the KCPE mean improved by 0.004 points for every Kenya shilling increase in the fee. Put differently, when a parent pays Kshs 100 for pupil motivation, school KCPE mean will go up by 0.4 points. The results are in line with Kithokoo's (2011) investigation of the elements in public primary schools in Yatta Division Lower Yatta District that influence students' performance on the Kenya Certificate of Primary Education (KCPE). According

to the data, students' low performance on the Kenya Certificate of Primary Education (KCPE) can be attributed to stress (14.4%), a lack of enthusiasm (45.1%), and all of the above (23.1%)..

#### **4.4 The Effect of School Remedial Levies on Academic Achievement in Public Day Primary Schools in Nyamira County**

The study's second goal was to determine how remedial fees in public day primary schools in Kenya's Nyamira County affected students' academic performance. This study tested the null hypothesis that school remedial levies have no statistically significant effect on academic achievement in public day primary schools in Nyamira County Kenya. Thus, this study used multiple linear regression analysis to model the impact of school remedial charges on academic attainment in public day primary schools. To achieve this objective the study first conducted univariate analysis (standard deviations, kurtosis, skewness, and means) for the school remedial levies (weekend remedial classes, evening remedial classes, and morning remedial classes) in order to describe the constructs of school remedial levies. The results are presented in section presented in section 4.4.1.

Secondly, the study ran a pair wise correlation to establish which school remedial levies constructs (weekend remedial classes, evening remedial classes, and morning remedial classes) and head teacher characteristics were correlated with the outcome variable (school KCPE mean score). The results of the bivariate statistics are presented in section 4.4.2. The study performed a model diagnostic test for the multiple regression analysis assumptions prior to fitting the multiple linear regression for testing objective two. The results of the model diagnostic test are presented in sections 4.4.3. The study then fitted a

multiple linear regression model to establish the effect of remedial levies on academic achievement in public day primary schools while controlling for head teachers' characteristics. Section 4.4.4 presents the multiple regression analysis results. The study concluded by testing the null hypothesis, which states that academic achievement in public day primary schools in Nyamira County, Kenya, is not statistically significantly impacted by school remedial charges. Section 4.4.5 presents the findings.

#### **4.4.1 Univariate Statistics for School Remedial Levies**

The study sought data from the primary school head teachers on the total monies solicited from class eight parents to support the school in conducting weekend remedial classes, evening remedial classes, and morning remedial classes for the class eight students. The descriptive statistics for monies solicited from class eight parents for school weekend remedial classes, evening remedial classes, and morning remedial classes are presented in section 4.4.1.1, 4.4.1.2, and 4.4.1.2 respectively.

##### **4.4.1.1 Univariate Statistics for School Weekend Remedial Classes Levies**

The survey asked head teachers of the schools for information on the total amount of money parents had paid for remedial lessons held on the weekends. Figure 10 presents the findings.

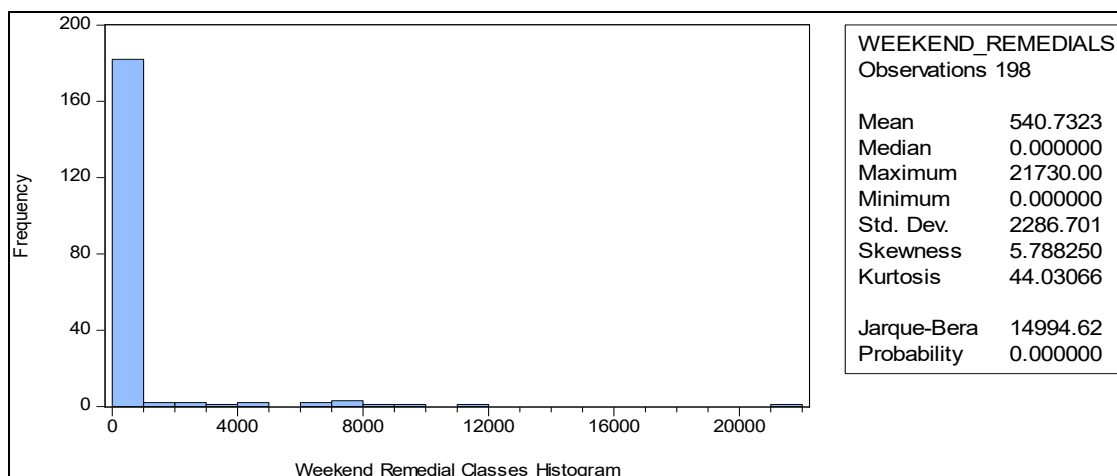


Figure 10: Summary Statistics and Histogram of Weekend Remedial Classes Levies.

Source: R Project Output, 2023

The histogram in Figure 10 showed that most schools ( $n=181$ , 91%) do not collect money for weekend remedial classes, according to head teachers. Thus, results show that only one school in every ten schools collect money for weekend remedial classes. Levies for weekend remedial ranged from zero to a maximum Kshs 21,730, with an average of Kshs 540.73. The median was zero, which supports the finding that most schools do not collect weekend remedial levies. The standard deviation (Kshs 2,286.70) was larger than the mean, indicating considerable variations amongst schools in collection of weekend remedial levies. The skewness (5.79) showed most data values were less than the mean while kurtosis (44.03) leptokurtosis in the data. The distribution of this variable was non-normal, as shown by skewness, kurtosis, and the  $JB$  test = 14994.62,  $p < 0.0001$ .

#### 4.4.1.2 Univariate Statistics for School Evening Remedial Classes Levies

The survey asked head teachers of the schools for information on the total amount of money parents had paid for after-school remedial lessons. Figure 11 presents the findings.

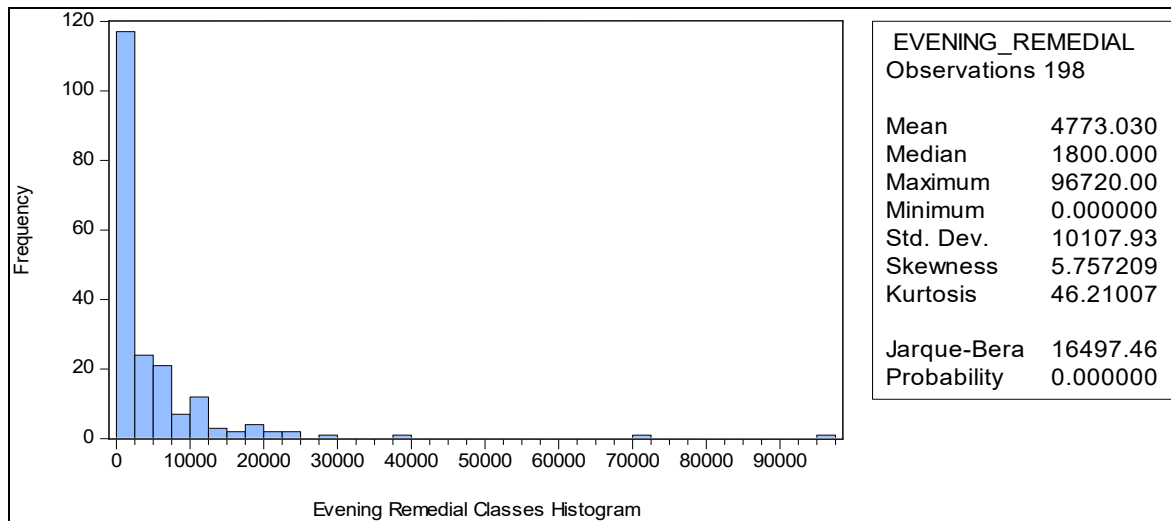


Figure 11: Summary Statistics and Histogram of Evening Remedial Classes Levies.

Source: R Project Output, 2023

Findings in Figure 11 showed that more schools were found to collect evening remedial class levies ( $n=117$ , 59%) relative to those which do not collect (41%). The levy ranged from zero to a maximum of Kshs 96,720, with an average collection of Kshs 4,773 per class. The median collection was Kshs 1,800. This confirms the study by Obar (2014) found that a sizable portion of the population—roughly 72%—reported having spent more than \$1,000 in a term. The study focused on the effects of private supplemental tuition on students' academic performance. Further the histogram shows that most collections for each school is less than Kshs 30,000. The large standard deviation (Kshs 10,107.93) showed the extant wide disparities in schools' collection of evening remedial levies. Most data values were less than the mean, as skewness (5.76) was positive whereas the distribution was leptokurtic, as kurtosis was large and positive (46.21). The  $JB = 16,497.46$ ,  $p < 0.0001$ , indicated non-normality in the distribution.

#### 4.4.1.3 Univariate Statistics for School Evening Morning Classes Levies

Data on the total amount of money parents have paid for school morning remedial classes was requested from the head teachers of the participating schools for the study.

The outcomes are displayed in Figure 12.

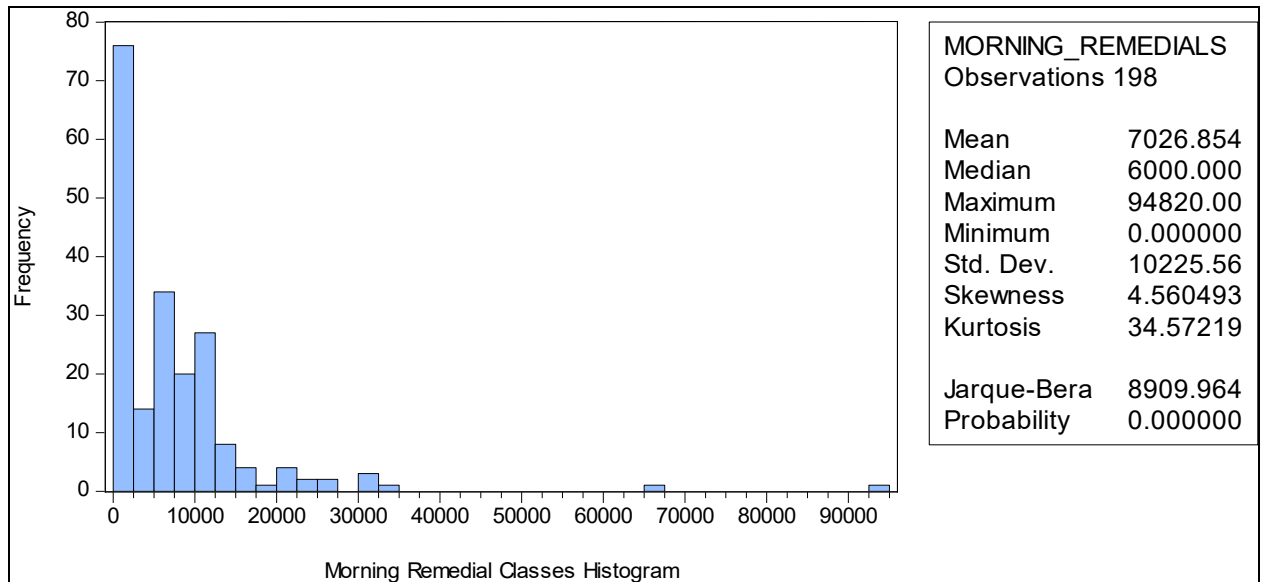


Figure 12: Summary Statistics and Histogram of Morning Remedial Classes Levies.

Source: R Project Output, 2023

As for morning remedial levies, most schools ( $n=127$ , 64%) were found to collect morning remedial class levies relative to those that do not collect (36%). The levy ranged from zero to a maximum Kshs 94,820, with a mean collection of Kshs 7,026.85 per class. The median collection was Kshs 6,000. The histogram shows that most collections for each school is less than Kshs 30,000. The large standard deviation (Kshs 10,225.56) suggest a large variance in the amount of morning remedial money collected by various schools in the county. Most data values were less than the mean, since skewness (4.56) was positive. On the other hand, the distribution was leptokurtic, as kurtosis was large

and positive (34.57). The  $JB = 8909.96$ ,  $p < 0.0001$ , indicated non-normality in the distribution.

#### 4.4.1.4 Univariate Statistics for Comparison of School Weekend, Evening, Morning Classes Levies

The mean contributions for weekend, evening and morning remedial classes were compared. Figure 13 presents the findings.

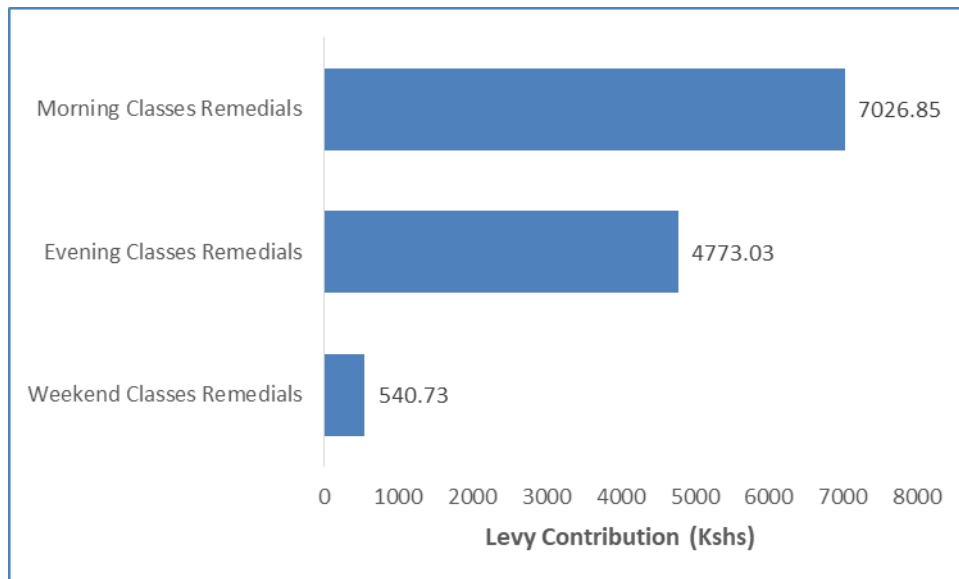


Figure 13: Comparison of School Morning, Evening, and Weekend Classes Levies

Source: R Project Output, 2023

The results in Figure 13 indicate that the most important remedial classes were those of morning, where parents contributed roughly twice (Ksh 7,027) the money they contributed for evening remedial classes (Kshs 4,773). The lowest contribution was

towards weekend remedial classes, where parents contributed, on average, just Kshs 541 per school.

#### 4.4.2 Bivariate Statistics for School Remedial Levies and Control Variables

To be able to fit the multiple linear regression model, the study ran two pair-wise correlations. First, the study ran a Pearson’s Correlation Coefficient,  $r$  to establish which school remedial levies constructs (weekend remedial classes, evening remedial classes, and morning remedial classes) were correlated with the outcome variable (school KCPE mean score) in order to establish which variable constructs to pursue in the regression model. In general, correlations with coefficients of correlation (in absolute value) less than 0.35 are regarded as low or weak, those between 0.36 and 0.67 as moderate, those between 0.68 and 1.0 as strong or high, and those with coefficients of correlation  $> 0.90$  as extremely high (Field, 2005). Table 11 presents the findings.

**Table 11: Correlation between School KCPE Mean and School Remedial Levies**

Variable (n = 198)		KCPE means	Weekend remedial	Evening remedial	Morning remedial
KCPE means	$r$	1			
Weekend remedial	$r$	0.127	1		
Evening remedial	$r$	0.184**	0.004	1	
Morning remedial	$r$	0.270**	0.465**	0.067	1

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Key:  $r$  = Pearson correlation coefficient; \*\*, \* = correlation significant at .01 and .05 levels (2-tailed), respectively

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Source: R Project Output, 2023

The results in Table 11 showed significant, positive but weak correlation between evening remedial ( $r=0.184$ ,  $p=0.009$ ) and morning remedial ( $r=0.270$ ,  $p<0.0001$ ) with school KCPE performance. The findings showed that when levies for evening and morning remedial increase, school KCPE performance also goes up and vice versa. Nevertheless, the study failed to find significant relationship between weekend remedial levy and KCPE performance ( $r=0.127$ ,  $p=0.075$ ). The relationship between morning and weekend remedial was found to be significant, positive and moderate ( $r=0.465$ ,  $p<0.0001$ ), suggesting that schools that have weekend remedial are also likely to have morning remedial.

Secondly, the study ran a Pearson's Correlation Coefficient,  $r$  to establish which control variables were correlated with the outcome variable (school KCPE mean score) in order to pursue in the regression model. The results are presented in Appendix 11. The results indicate that of all the twelve (12) control variables only four (head teachers sex, teachers mean age, teachers mean experience and, teachers years of schooling) were correlated with school KCPE mean score hence were pursued in the regression analysis.

### **4.4.3 Model Diagnostic Testing for Multivariate Analysis of the Effect of School Remedial Levies on School Academic Achievement**

The study established whether the data for objective two met the assumptions of the multiple regression model. The study conducted several diagnostic tests statistics. The analysis included linearity, normality, homoscedasticity, and outlier's presence to ensure the validity of the results. These are the fundamental presumptions of OLS. The dependent variable is a linear function of a set of predictor variables plus the error term, according to the first definition of linearity. Second, disturbances, which include mistakes and residuals, are uncorrelated (nonautocorrelated) and have the same variance (homoscedastic). Last but not least, there is no multicollinearity—that is, no precise linear relationship between the independents (Chatterjee and Simonoff, 2012; Green, 2008). The diagnostic tests statistics results for linearity, homoscedasticity of the residuals, multicollinearity, and autocorrelation are presented in sections 4.4.3.1, 4.4.3.2, 4.4.3.3, and 4.4.3.4 respectively

#### **4.4.3.1 Linearity**

The scatterplot predicting KCPE mean from school weekend remedial levies and a Lowess smoother is shown in Figure 14.

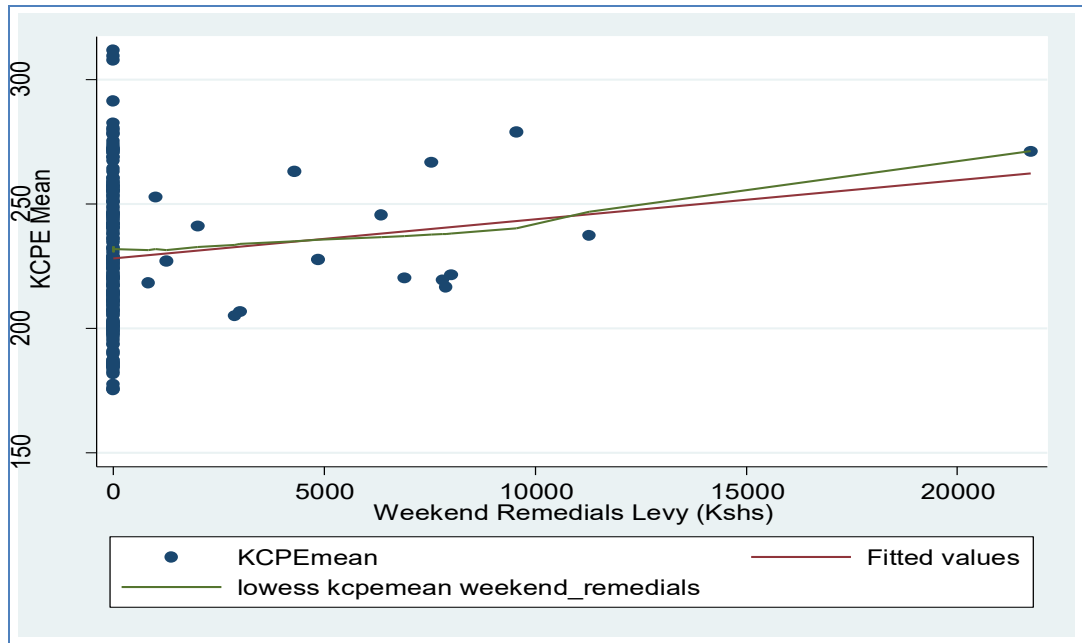


Figure 14: Scatterplot of KCPE Mean and Weekend Remedial Levies

Source: R Project Output, 2023

From Figure 14, the curves of predicted values and loess values were relatively straight, suggesting linearity in the data.

The scatterplot predicting KCPE mean from school evening remedial levies and a Lowess smoother is shown in Figure 15.

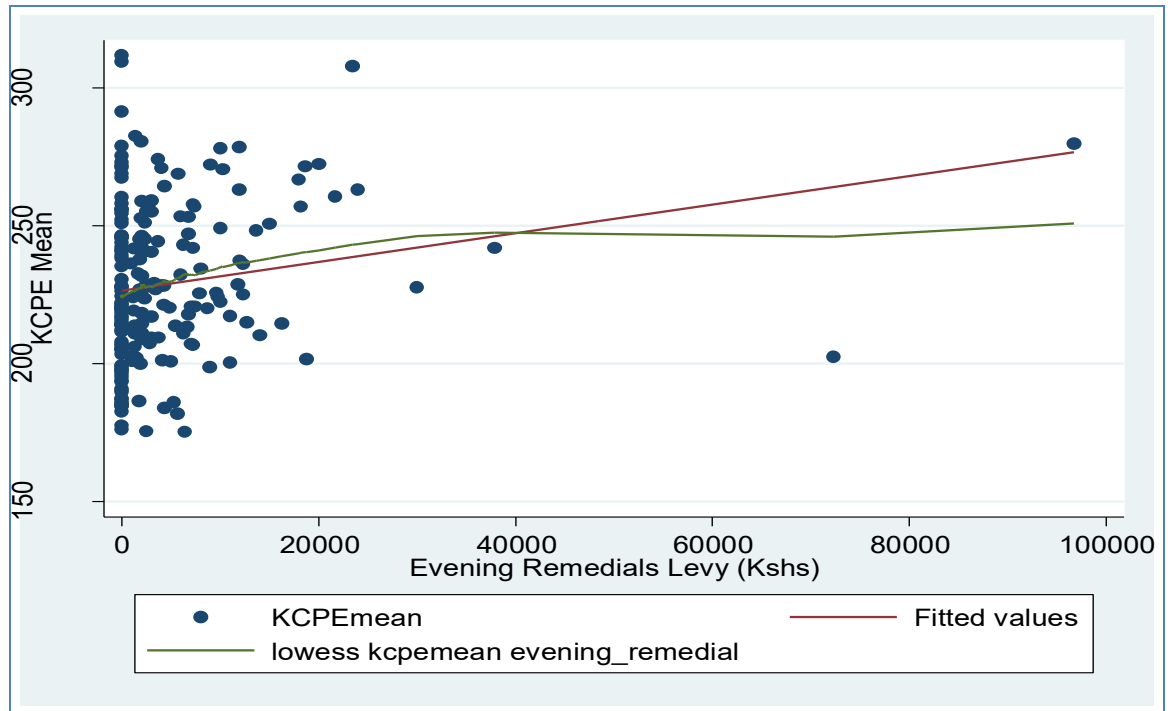


Figure 15: Scatterplot of KCPE Mean and Evening Remedial Levies

Source: R Project Output, 2023

From Figure 15 while the fitted values showed a linear relationship, a kink in the loess curve suggested some nonlinearity in the data.

The scatterplot predicting KCPE mean from pupils' morning remedial levies and a lowess smoother is shown in the Figure 16.

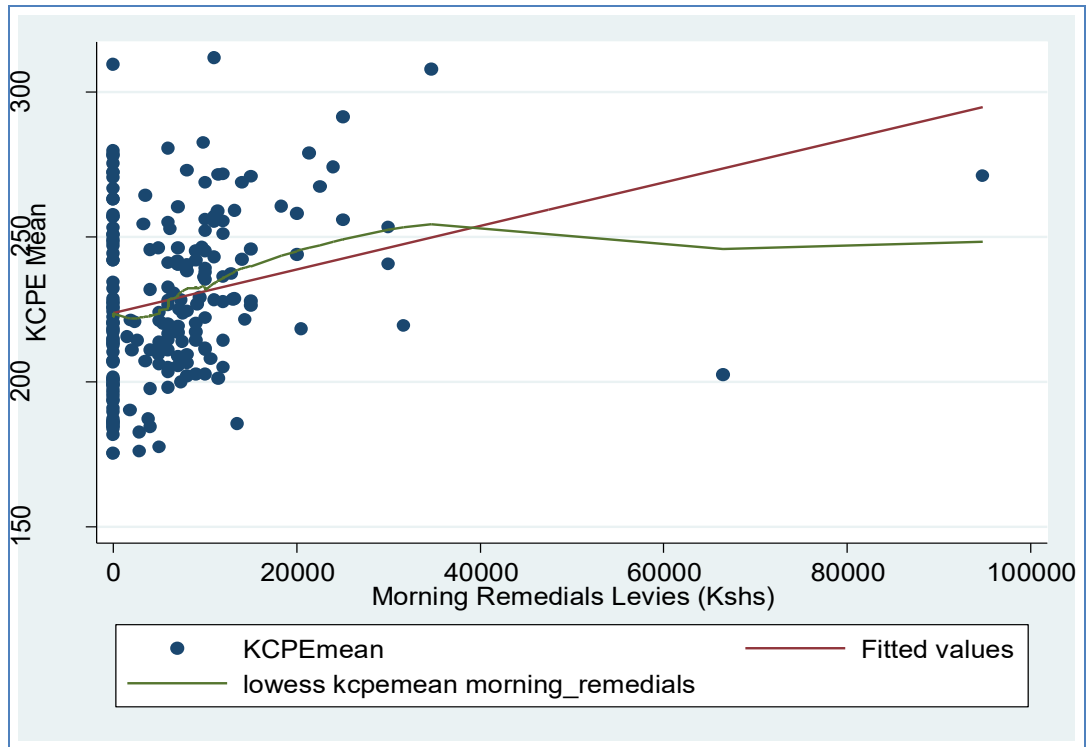


Figure 16: Scatterplot of KCPE Mean and Morning Remedial Levies

Source: R Project Output, 2023

From Figure 16 while the fitted values showed a linear relationship, a kink in the loess curve suggested some nonlinearity in the data.

#### 4.4.3.2 Homoscedasticity of the Residuals

Figure 17 shows a plot of the residuals versus fitted (predicted) values.

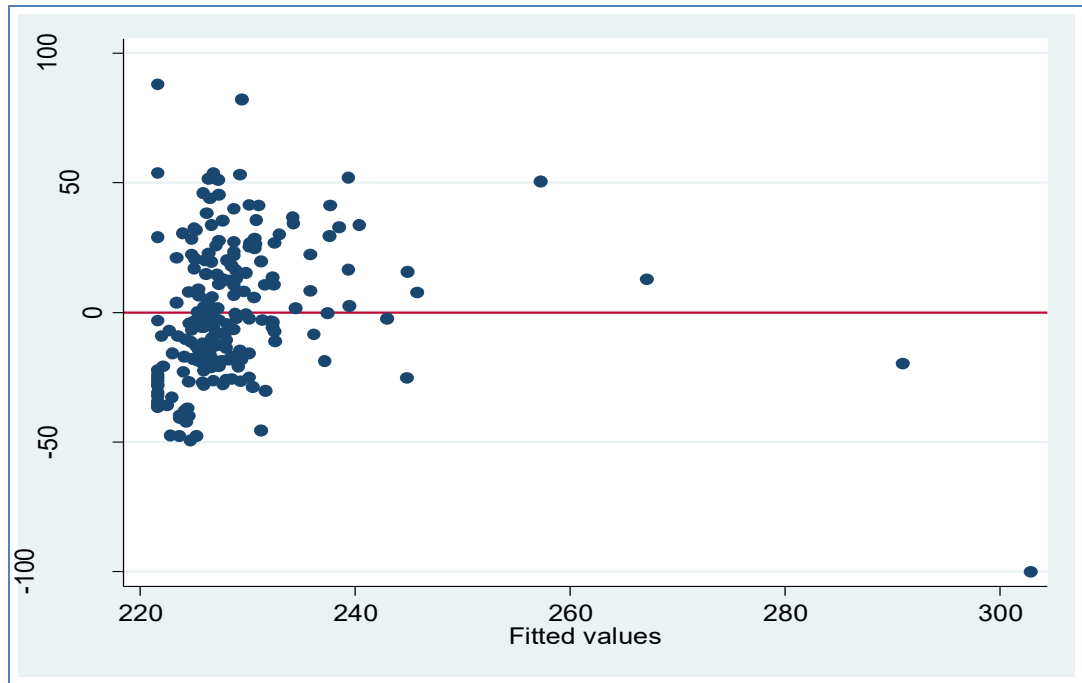


Figure 17: Plot of Residuals versus Fitted Values for Remedial Levies' Variables

Source: R Project Output, 2023

The results in Figure 17 showed that the residuals for the MLR were randomly scattered around the center line of zero, with no discernible pattern. This showed that the residuals were homoscedastic, approximately normally distributed, and non-autocorrelated.

#### 4.4.3.3 Multicollinearity

Table 12 presents Variance Inflation Factor (VIF) and tolerance ( $1/VIF$ ) values from MLR.

**Table 12: Multicollinearity Statistics for School Remedial Levies**

Variable	VIF	1/VIF
Morning remedial	1.28	0.779
Weekend remedial	1.28	0.783
Evening remedial	1.01	0.995
Mean VIF	1.19	

Key: VIF=variance inflation factor

Source: R Project Output, 2023

From Table 12, the tolerance values were close to the maximum (one), showing that multicollinearity might not have been a problem for remedial levies' variables. Therefore, it appears from the data that none of the variables were a linear combination of the other predictor variables. VIF is just a different mathematical expression of tolerance. Furthermore, Table 4.7's positive but moderate to weak correlations between the independents (minimum = 0.184, maximum = 0.465) suggested that multicollinearity was not likely to be an issue.

#### **4.4.3.4 Autocorrelation**

In this model, the Durbin-Watson statistic of 1.873 indicated that the errors were not related to one another.

#### **4.4.4 Multivariate Analysis for the Effect of School Remedial Levies on Academic Achievement in Public Day Primary Schools in Nyamira County**

This study used two models to model the effect of school remedial levies on academic achievement in public day primary schools in Nyamira County. In model 1, the study

assesses the effect of school remedial levies on academic achievement in public day primary schools. In model 2, the study assesses the effect of school remedial levies on academic achievement in public day primary schools while controlling for head teachers characteristics.

In the model, the value of the coefficient indicates aggregate mean points in KCPE. The positive sign and negative signs of the coefficient indicate increased and decreased school aggregate points in KCPE respectively. The significance of the relationship between a given explanatory variable and school mean score in KCPE is tested at  $p=0.05$ . The results of the multiple regression modelling for the effect of school remedial levies on academic achievement in public day primary schools is presented in Table 13.

**Table 13: Multiple Linear Regression Results for the Effect of School Remedial Levies on School Academic Achievement**

Variable ( $n=198$ )	Model 1				Model 2			
	<i>B</i>	$\beta$	<i>t</i>	<i>P</i>	<i>B</i>	<i>B</i>	<i>T</i>	<i>P</i>
(Constant)	221.669		2.49	0.000	332.45		7.29	0.000
Weekend remedial	0.00009	0.0073	0.1	0.92	0.0002	0.0175	0.23	0.82
Evening remedial	0.0005	0.1673	2.45	0.02	0.0006	0.1966	2.93	0
Morning remedial	0.0007	0.2553	3.31	0	0.0007	0.2532	3.37	0
Control Variables								
Sex_2					8.7163	0.1235	1.85	0.07
Mean age					-2.5236	-0.222	-2.24	0.03
Mean experience					0.333	0.0267	0.27	0.79
$R^2$	0.1007				0.16			
Adjusted $R^2$	0.0868				0.1336			
F Change	7.24				6.06			
<i>P</i>	0.0001				$p<0.0001$			
Key: <i>B</i> = b coefficient (unstandardized), $\beta$ = Beta (standardized coefficient)								

Source: R Project Output, 2023

Results of multiple regression analysis in Table 13 shows that in the first model,  $R^2$  was 0.1007, showing that weekend, evening and morning remedial could jointly explain about 10% of the variation in school KCPE performance. The results indicated that remedial levies account for greater school KCPE performance compared to motivational levies. Adding control variables (Model 2), significantly [ $F(3, 194) = 7.24, p < 0.0001$ ], improved the explanatory power of the model to 16%. If the second model had been derived from the population rather than the sample, then it would have accounted for about 13% of the variance in the dependent variable.

In the final model, the partial regression coefficient for evening remedial levies ( $b=0.0006, t=293, p=0.004$ ) and morning remedial levies ( $b=0.0007, t=3.37, p=0.001$ ) were statistically significant. This showed that an increase in the evening remedial levy by one Kenya shilling results in an improvement in the school KCPE mean by 0.006 points, *ceteris paribus*. Similarly, when morning remedial levy goes up by one Kenya shilling, there is an increase in school KCPE mean by 0.007 points, *ceteris paribus*.

These findings are consistent with a multitude of other research findings that support the notion that remedial engagement and academic achievement in elementary schools are positively correlated. Asuba (2016) and Mboi et al. (2013) Remedial programs, like educational interventions, have a major impact on students' reading, language, and arithmetic skills, according to research by Asiago et al. (2018) (Ajwani, 2006; Ashdown & Simic, 2000; Luftig, 2003), as well as physics, biology, and foreign languages (Mori, 2002). A statistically significant relationship between school financial resources and the

school's KCSE mean score was found in Asiago et al.'s (2018) study on the impact of school financial resources on student academic achievement in the Kenya Certificate of Secondary Education Examination (KCSE) in Public Secondary Schools in Kenya. The school's K.C.S.E. mean score was projected by financial resources to be 11.1 percent. While Asiago et al. (2018) focused on the financial component of secondary education, remediation in public day primary schools may also be impacted by financial resources because remediation is dependent on them.

However, weekend remedial levy was found to have no significant effect on school KCPE performance ( $b = -0.0002$ ,  $t = 0.23$ ,  $p = 0.816$ ). The standardized coefficients showed that morning remedial levy ( $\beta = 0.253$ ) has a greater effect on school KCPE performance relative to evening remedial levy ( $\beta = 0.1966$ ).

Among the control variables, only teacher's age ( $b = -2.523$ ,  $t = -2.24$ ,  $p = 0.026$ ) was found to significantly influence school KCPE performance. This showed that when the age of teacher increases by one year, school KCPE performance decreases by 2.52 points. Neither the teacher's gender ( $b = 8.716$ ,  $t = 1.85$ ,  $p = 0.065$ ) nor teacher's experience ( $b = 0.333$ ,  $t = 0.27$ ,  $p = 0.787$ ) were found to significantly influence school KCPE performance.

#### **4.4.5 Testing the Null Hypothesis that School Remedial Levies have no Statistically Significant Effect on Academic Achievement in Public Day Primary Schools in Nyamira County, Kenya.**

The research hypotheses of the study were tested using t-tests provided in various regression analyses. The  $B$  coefficient for evening remedial levies ( $b = 0.0006$ ,  $t = 2.93$ ,  $p = 0.004$ ) and morning remedial levies ( $b = 0.0007$ ,  $t = 3.37$ ,  $p = 0.001$ ) were statistically

significant. It was therefore highly unlikely that the population  $B$  coefficients for these variables were zero. Thus, the null hypothesis that school remedial levies have no statistically significant effect on academic achievement in public day primary schools in Nyamira County was rejected while the alternate hypothesis that School remedial levies have statistically significant effect on academic achievement in public day primary schools in Nyamira County Kenya was accepted.

#### **4.5 The Effect of School Examination Levies on Academic Achievement in Public Day Primary Schools in Nyamira County**

The third objective of the study was to establish the effect of school examination levies on academic achievement in public day primary schools in Nyamira County, Kenya. This study tested the null hypothesis that school examination levies have no statistically significant effect on academic achievement in public day primary schools in Nyamira County Kenya. This study therefore modelled the effect of school examination levies on academic achievement in public day primary schools using multiple linear regression analysis. To achieve this objective the study first conducted univariate analysis (standard deviations, kurtosis, skewness, and means) for the school examination levies (internal school examinations, divisional examinations, and sub-county mock examinations) in order to describe the constructs of school examination levies. The results are presented in section presented in section 4.5.1.

Secondly, the study ran a pair wise correlation to establish which school examination levies constructs (internal school examinations, divisional examinations, and sub-county mock examinations) and head teacher characteristics were correlated with the outcome variable (school KCPE mean score). The results of the bivariate statistics are presented in

section 4.5.2. Before fitting the multiple linear regression, the study conducted the model diagnostic test for the assumptions of multiple regression analysis for testing objective three. The results of the model diagnostic test are presented in sections 4.5.3. The study then fitted a multiple linear regression model to establish the effect of school examination levies on academic achievement in public day primary schools while controlling for head teachers characteristics. The results of the multiple regression analysis are presented in section 4.5.4. Finally, the study tested the null hypothesis that school examination levies have no statistically significant effect on academic achievement in public day primary schools in Nyamira County, Kenya. The results are presented in section 4.5.5.

#### **4.5.1 Univariate Statistics for School Examination Levies**

The study sought data from the primary school head teachers on the total monies solicited from class eight parents to support the school in conducting internal school examinations, divisional examinations, and sub-county mock examinations for the class eight students. The descriptive statistics for monies solicited from class eight parents for school internal examinations, divisional examinations, and sub-county mock examinations are presented in sections 4.5.1.1, 4.5.1.2, and 4.5.1.3 respectively.

##### **4.5.1.1 Univariate Statistics for School Internal Examination Levies**

The study sought data from the school head teachers on the total monies collected from parents towards supporting the school internal examinations program. The results are presented in Figure 18.

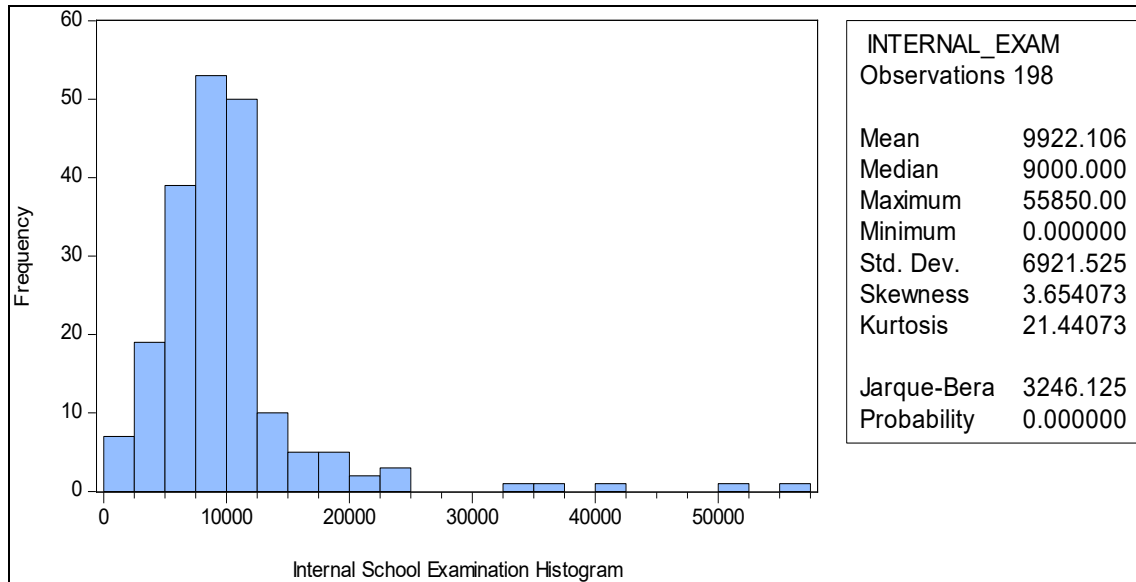


Figure 18: Summary Statistics and Histogram of Internal School Examination Levies

Source: R Project Output, 2023

Findings in Figure 18 showed that internal school examination levy ranged from zero to a maximum Kshs 55,850, with an average collection of Kshs 9,922.11 per standard eight class. Only one school was found not to collect this levy, showing that practically every school collect monies for internal examinations. The median collection was Kshs 9,000 and was close to the mean, suggesting a dispersion approximating the Gaussian distribution. The standard deviation was Kshs 6,921, suggesting that most schools collect between Kshs 3,000.58 and Kshs 16,843.63, for class eight internal examinations, a finding supported by the shape of the histogram. As seen from the histogram, in Figure 18 the data was skewed to the right (3.65), suggesting that most schools collect internal examination levies close to or below the mean. There were more items at the tails and close to the mean, but fewer in the intermediate regions, according to a kurtosis of 21.44. The  $JB = 3246.13$ ,  $p < 0.0001$ , indicated non-normality in the distribution.

#### 4.5.1.2 Univariate Statistics for School Divisional Mock Examination Levies

The survey asked head teachers of the schools for information on the overall amount of money parents had contributed to the school divisional mock examinations program.

Figure 19 presents the findings.

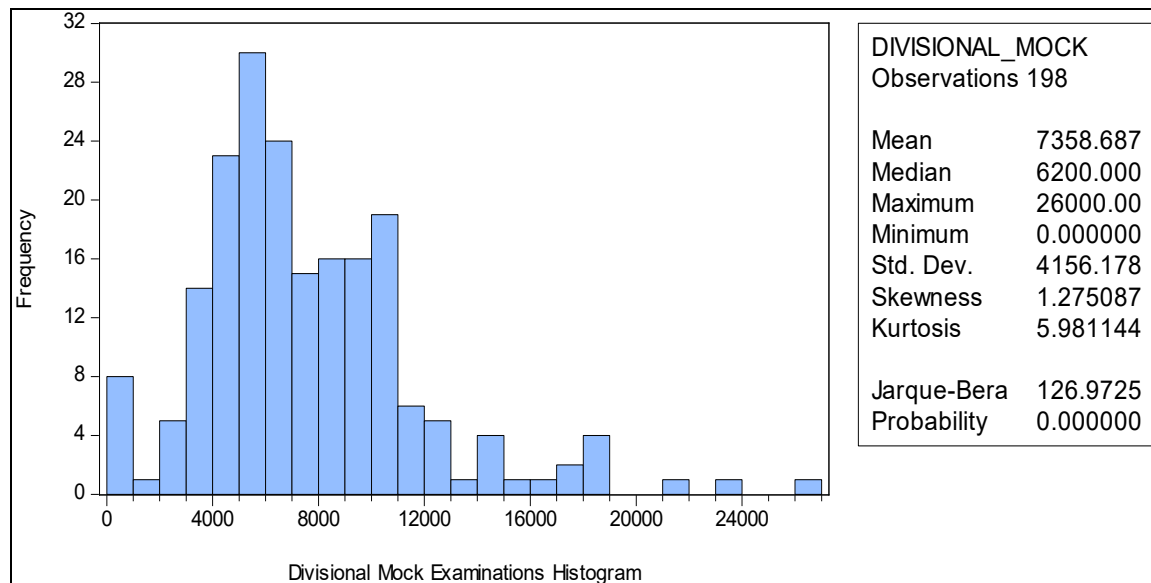


Figure 19: Summary Statistics and Histogram of Divisional Mock Examination Levies

Source: R Project Output, 2023

The findings in Figure 19 indicate that eight schools (4%) did not collect money for divisional mock examinations compared with 96% which did, showing that public primary day schools in Nyamira County predominantly offer these tests. The range for this levy was between zero and Kshs 26,000, with an average of Kshs 7,358.69 for each standard eight class in the study. The standard deviation was Kshs 4,156, suggesting that most schools collect between Kshs 3,202.51 and Kshs 11,514.87, for class eight internal examinations, a conclusion supported by the shape of the histogram. The median collection (Kshs 6,200) was close to the mean, suggesting a distribution approaching the

normal distribution. The skewness (1.28) was less than two, suggesting symmetry of data about the mean. Kurtosis (5.98) was also relatively small, suggesting a distribution that did not depart radically from the normal, despite the  $JB = 126.97$ ,  $p < 0.0001$  test, implying non-normality in the data.

#### 4.5.1.3 Univariate Statistics for School Sub-County Mock Examination Levies

The survey asked head teachers of the schools for information on the total amount of money parents had contributed to the school's sub-county mock exams program. Figure 20 presents the findings.

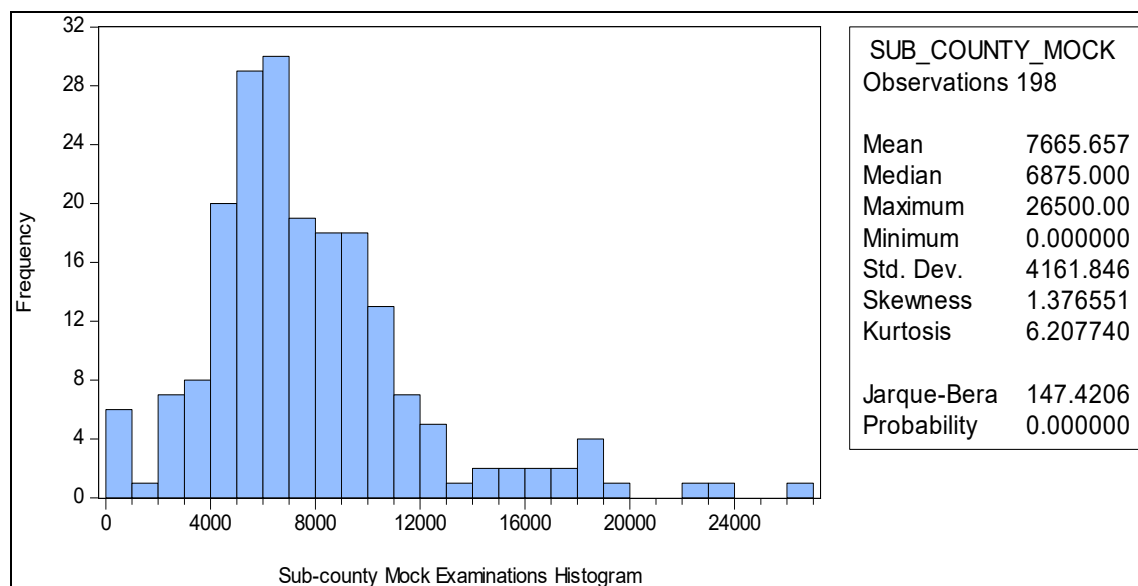


Figure 20: Summary Statistics and Histogram of Sub-County Mock Examination Levies

Source: R Project Output, 2023

The results in Figure 20 indicate that the sub-county mock examinations levy was Kshs 7,665.66 and it ranged from a minimum of zero to a maximum of Kshs 26,500. Head teachers from only six schools (3%) answered that their schools did not collect levies for sub-county mock examinations, showing that most of the schools do so. The median was

Kshs 6,875, supporting the finding that most schools collect sub-county mock examinations levies. The standard deviation was Kshs 4,161.85, showing that most schools collect between Kshs 3,503.81 and Kshs 11,827.50 for sub-county mock tests. Although, the  $JB = 147.42$ ,  $p < 0.0001$ , indicated non-normality, the skewness (1.38) and kurtosis (6.21) were either within or close to the benchmark  $\pm 2$ , which showed that the data did not radically depart from normality.

#### **4.5.2 Bivariate Statistics for School Examination Levies and Control Variables**

To be able to fit the multiple linear regression model, the study ran two pair-wise correlations. First, the study ran a Pearson's Correlation Coefficient,  $r$  to establish which school examination levy constructs (internal school examinations, divisional examinations, and sub-county mock examinations) were correlated with the outcome variable (school KCPE mean score) in order to establish which variable constructs to pursue in the regression model. In general, correlations with coefficients of correlation (in absolute value) less than 0.35 are regarded as low or weak, those between 0.36 and 0.67 as moderate, those between 0.68 and 1.0 as strong or high, and those with coefficients of correlation  $> 0.90$  as extremely high (Field, 2005). Table 14 presents the findings.

**Table 14: Correlation between School KCPE Mean and School Examination Levies**

Variable (n = 198)		KCPE means	Internal School examination	Divisional Mock Examinations	Sub-county Mock Examinations
KCPE means	R	1			
Internal School examination	R	0.517**	1		
Divisional Mock Examinations	R	0.263**	0.634**	1	
Sub-county Mock Examinations	R	0.292**	0.659**	0.817**	1

Key:  $r$  = Pearson correlation coefficient; \*\*, \* = correlation significant at .01 and .05 levels (2-tailed), respectively

Source: R Project Output, 2023

The results in Table 14 showed a significant, positive, and moderate correlation between internal examination levies ( $r=0.517$ ,  $p<0.0001$ ). On the other hand, the correlation between division mock ( $r=0.263$ ,  $p=0.0002$ ) and sub-county mock ( $r=0.292$ ,  $p<0.0001$ ) levies with school KCPE performance were significant, positive but weak. The findings showed that when levies for all examinations increases, school KCPE performance also goes up and vice versa. However, the strongest correlation was found between internal examination levies and school KCPE performance, suggesting that this levy could have the most profound effect on school performance in KCPE. This concurs with the findings of the study conducted by Achoka et al. (2022) which revealed that the internal examinations scores were a true reflection of the scores got at KCSE within (mean = 3.800, std Dev =1.13529). The study also found strong correlations amongst the three

examination levies, which showed that most primary schools in the county charged all the three levies.

Secondly, the study ran a Pearson's Correlation Coefficient,  $r$  to establish which control variables were correlated with the outcome variable (school KCPE mean score) in order to pursue in the regression model. The results are presented in Appendix 11. The results indicate that of all the twelve (12) control variables only four (head teachers sex, teachers mean age, teachers mean experience and, teachers years of schooling) were correlated with school KCPE mean score hence were pursued in the regression analysis.

#### **4.5.3 Model Diagnostic Testing for Multivariate Analysis of the Effect of School Examination Levies on School Academic Achievement**

The study established whether the data for objective three met the assumptions of the multiple regression model. The study conducted several diagnostic test statistics. The analysis included linearity, normality, homoscedasticity, and outlier's presence to ensure the validity of the results. The core assumptions of OLS are as follows. First, linearity asserts that the dependent variable is a linear function of a set of predictor variable and the error term. Secondly, disturbances (errors/residuals) have the same variance (homoscedastic) and are not related with one another (nonautocorrelated). Lastly, there is no exact linear relationship among independents, that is, no multicollinearity (Chatterjee and Simonoff, 2012; Green, 2008). The diagnostic tests statistics results for linearity, homoscedasticity of the residuals, multicollinearity, and autocorrelation are presented in sections 4.5.3.1, 4.5.3.2, 4.5.3.3, and 4.5.3.4 respectively

### 4.5.3.1 Linearity

The scatterplot predicting KCPE mean from school internal examination levies and a Lowess smoother is shown in Figure 21.

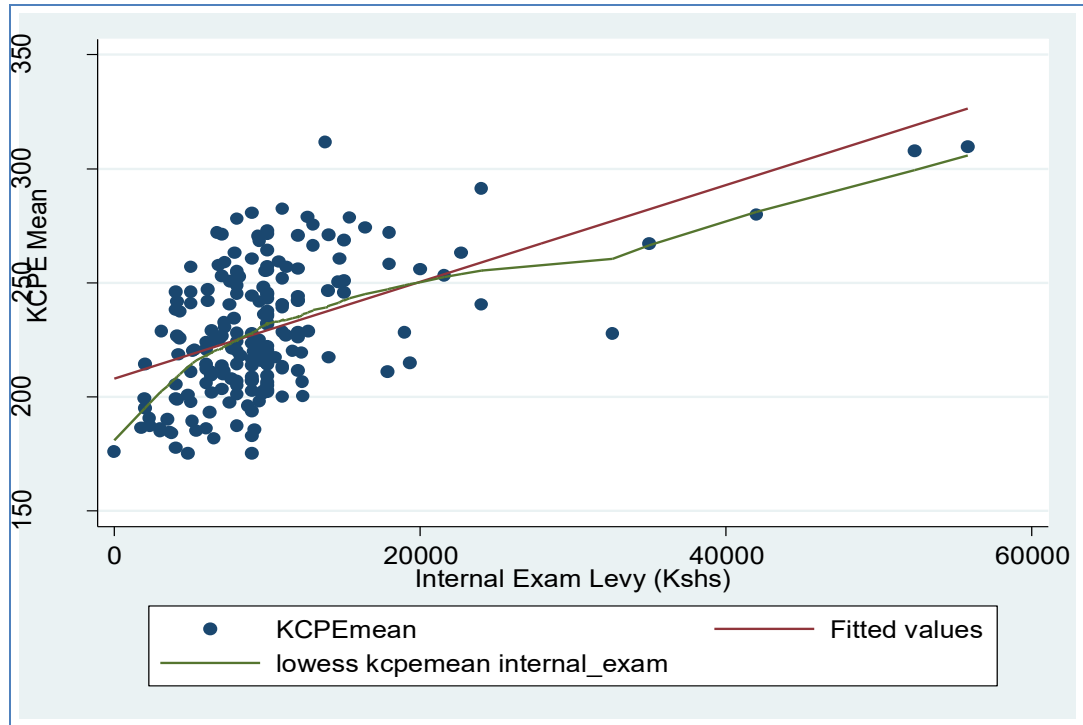


Figure 21: Scatterplot of KCPE Mean and Internal Examination Levies

Source: R Project Output, 2023

Figure 21's results show that while the curve for the loess values had a small kink, the curve for the fitted values and the one for the other values were largely straight, indicating that the data were linear.

The scatterplot predicting KCPE mean from divisional mock levies and a lowess smoother is shown in the Figure 22.

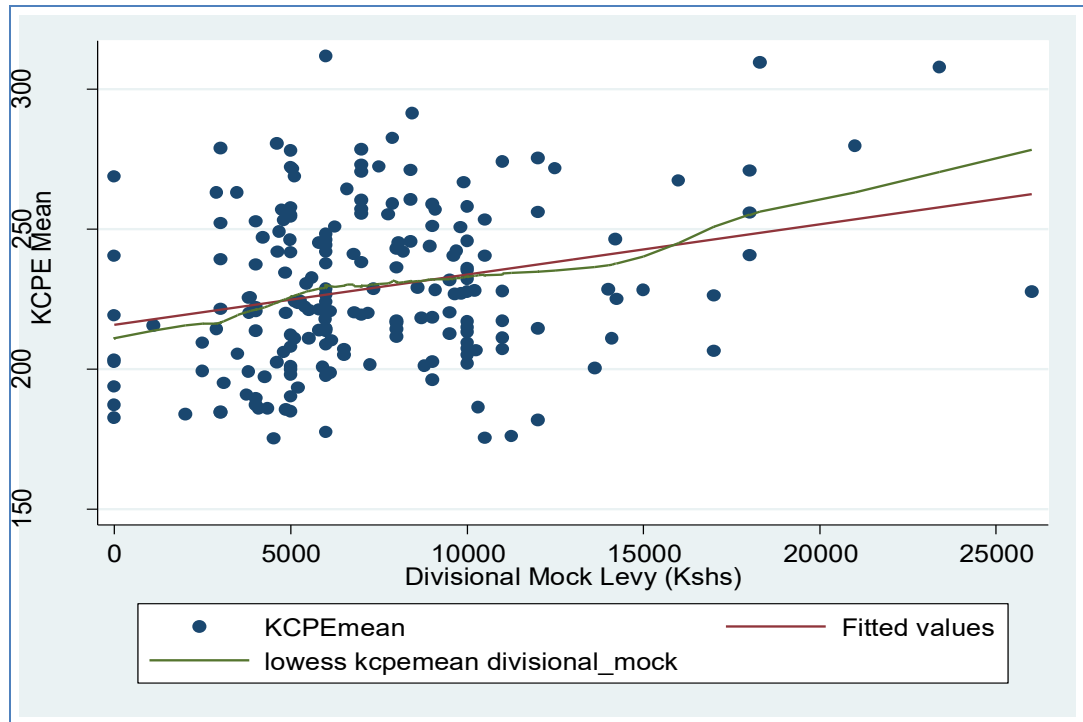


Figure 22: Scatterplot of KCPE Mean and Divisional Mock Examination Levies

Source: R Project Output, 2023

The results in Figure 22 indicate that while the fitted values showed a linear relationship, a kink in the loess curve suggested some nonlinearity in the data.

The scatterplot predicting KCPE mean from Sub County mock levies and a lowess smoother is shown in the Figure 23.

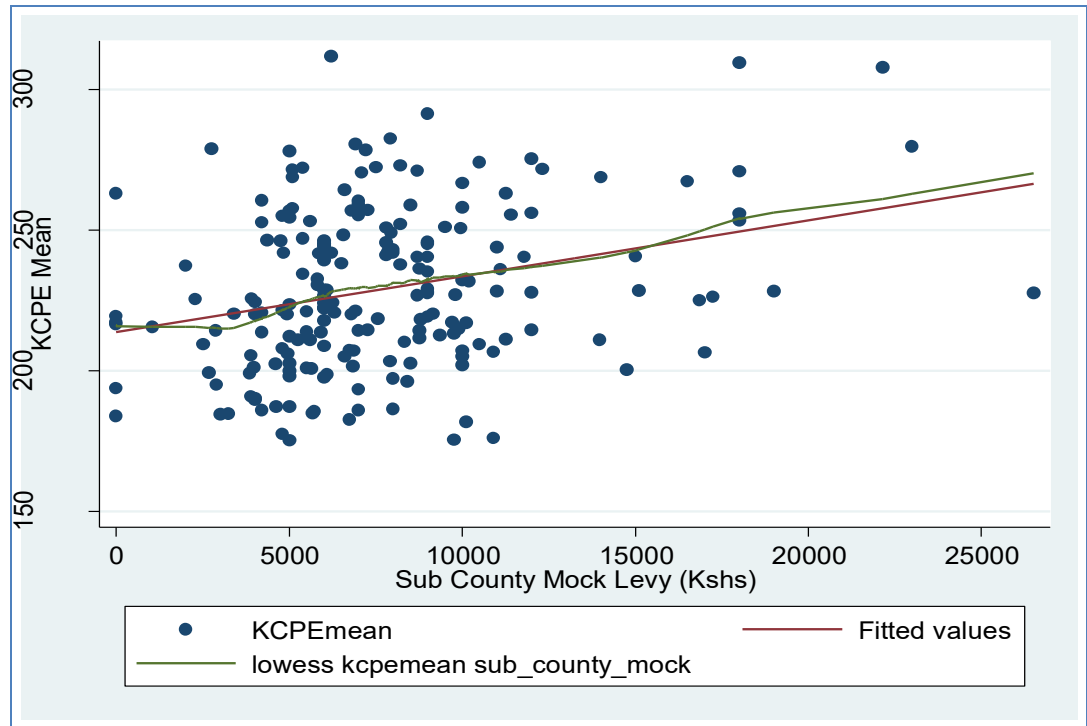


Figure 23: Scatterplot of KCPE Mean and Sub-County Mock Examination Levies

Source: R Project Output, 2023

The results in Figure 23 indicate that both the fitted values and the loess curve generally exhibited a linear relationship, suggesting linearity in the data.

#### 4.5.3.2 Homoscedasticity of the Residuals

Figure 24 shows a plot of the residuals versus fitted (predicted) values.

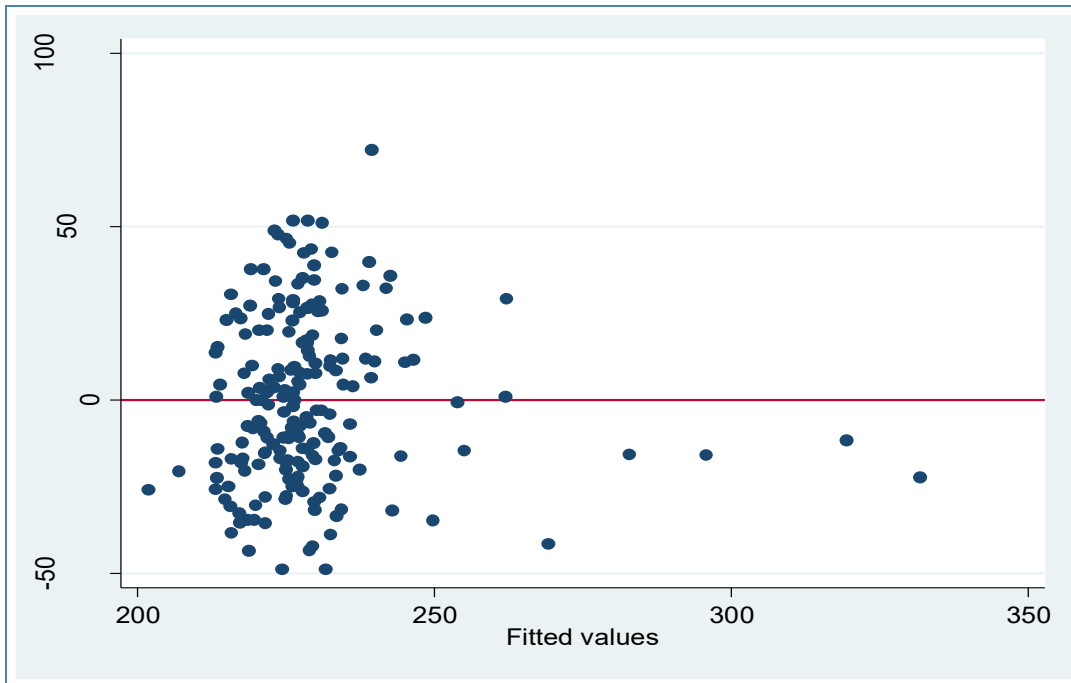


Figure 24: Plot of Residuals versus Fitted Values for Examination Levy Variables

Source: R Project Output, 2023

Figure 24's results show that there was no discernible pattern in the residuals for the MLR, which were dispersed randomly around the center line of zero. This demonstrated that the residuals were non-autocorrelated, roughly normally distributed, and had a constant variance (homoscedasticity). The Breusch-Pagan Test,  $\chi^2(1) = 0.01, p=0.9041$ , showed that the null hypothesis of constant variance in the residuals was accepted. Thus, residuals had homogenous variance.

#### 4.5.3.3 Multicollinearity

Table 15 presents Variance Inflation Factor (VIF) and tolerance ( $1/VIF$ ) values from MLR.

**Table 15: Multicollinearity Statistics for School Examination Levies**

Variable	VIF	1/VIF
Internal School Examination Levy	1.86	0.538
Divisional Mock Examination Levy	3.16	0.316
Sub-county Mock Examination Levy	3.34	0.299
Mean VIF	2.79	
Key: VIF=Variance Inflation Factor		

Source: R Project Output, 2023

From Table 15, tolerance values were all greater than 0.1 (ranging from 0.299 to 0.538) for each predictor variable, indicating that multicollinearity might not have been a problem. Consequently, the results suggest that no variable was a linear combination of other predictor variables. Correlations amongst the independents (Table 4.10) were high but not very high, which showed that multicollinearity was not likely to be a problem.

#### **4.5.3.4 Autocorrelation**

The Durbin-Watson statistic was 1.924, showing that the residuals were not correlated.

#### **4.5.4 Multivariate Analysis for the Effect of School Examination Levies on Academic Achievement in Public Day Primary Schools in Nyamira County**

This study used two models to model the effect of school examination levies on academic achievement in public day primary schools in Nyamira County. In model 1, the study assesses the effect of school examination levies on academic achievement in public day primary schools. In model 2, the study assesses the effect of school examination levies on academic achievement in public day primary schools while controlling for head teachers characteristics.

In the model, the value of the coefficient indicates aggregate mean points in KCPE. The positive sign and negative signs of the coefficient indicate increased and decreased school aggregate points in KCPE respectively. The significance of the relationship between a given explanatory variable and school mean score in KCPE is tested at  $p=0.05$ . The results of the multiple regression modelling for the effect of school examination levies on academic achievement in public day primary schools is presented in Table 16.

**Table 16: Multiple Linear Regression Results for the Effect of School Examination Levies on School Academic Achievement**

Variable ( $n=198$ )	Model 1				Model 2			
	$B$	$\beta$	$t$	$P$	$B$	$B$	$t$	$p$
(Constant)	210.735		56.32	0.000	295.517		9.36	0.000
Internal exams levy	0.0024	0.5911	7.09	0.000	0.0024	0.5741	6.94	0.000
Divisional mock levy	-0.0007	-0.097	-0.89	0.374	-0.0005	-0.0754	-0.7	0.483
Sub county mock levy	-0.0001	-0.019	-0.17	0.866	0.0002	-0.0257	-0.23	0.915
Control Variables								
Sex_2					2.3772	0.0337	0.55	0.583
Mean age					-1.8677	-0.1644	-2.71	0.007
$R^2$	0.2747				0.3034			
Adjusted $R^2$	0.2635				0.2853			
$F$ Change	24.5				16.73			
$P$	$p<0.0001$				$p<0.0001$			

Key:  $B= b$  coefficient (unstandardized),  $\beta =$  Beta (standardized coefficient)

Source: R Project Output, 2023

The results of the multiple linear regression in Table 16 indicate that in the first model,  $R^2$  was 0.275, showing that internal examinations, divisional mock examinations, and sub county mock examination levies could jointly explain about 28% of the variation in academic performance. The results indicated that internal examination levies accounted for greater school KCPE performance compared to sub-county examination levies (about 10%). Adding control variables (Model 2), significantly [ $F(5, 192) = 16.72, p<0.0001$ ],

improved the explanatory power of the model to 30%. If the second model had been derived from the population rather than the sample, then it would have accounted for about 29% of the variance in the dependent variable, which would have been just about 1.81% less than the model. The results showed that examination levies could account for a relatively significant amount of variance in school KCPE performance.

In the final model, only the partial regression coefficient for internal examination levy ( $b=0.0024$ ,  $t=6.94$ ,  $p<0.0001$ ) was statistically significant. This showed that when internal examination levies increase by one Kenya shilling, the school KCPE mean goes up by 0.0024 points, *ceteris paribus* or by 0.00058% (coefficient of determination =  $r^2 = 0.0024^2$ ). Put differently, an increase in internal examination levy by Ksh 100 will result in an increase in school KCPE mean by 0.24 points or about 6%. These results are similar to the study conducted by Osukuku et al., (2021), on influence of internal examination setting practices on students' academic achievement in public day secondary schools. The results of the multiple regression analysis after controlling for student and school level variables in the model revealed that internal examination setting practices was significantly associated with student aggregate points in KCSE at the 95% level. However, divisional mock ( $b= -0.0005$ ,  $t= -0.23$ ,  $p=0.483$ ) and sub county mock ( $b= -0.0002$ ,  $t= -0.23$ ,  $p=0.615$ ) examination levies were found to have no significant effect on school KCPE performance.

These findings are in line with the studies that were conducted by Awour (2012), and Achoka et al. (2022), whose findings revealed a positive relationship between examinations and academic achievement. Further this is evidenced by the study conducted by Achoka et al. (2022), on effectiveness of schools' examination practices on

KCSE performance in public secondary schools in Kakamega County. Their study findings indicate that the respondents reported that they had increased their students' average admission score (Mean=3.9000, Std. Dev = .87560) and that the findings revealed that the internal examinations scores were a true reflection of the scores got at KCSE within (Mean=3.8000, Std. Dev = 1.13529).

From the findings, the standardized coefficients showed that only internal examination levy ( $\beta=0.5741$ ) had a significant effect on school KCPE performance, with an increase of one standard deviation in the levy leading to an improvement in school KCPE performance by roughly 0.5741 of its standard deviation, *ceteris paribus*. Among the control variables, only teacher's age ( $b= -1.8677$ ,  $t= -2.71$ ,  $p=0.007$ ) was found to significantly influence school KCPE performance. This showed that when the age of teacher increases by one year, school KCPE performance decreases by 1.87 points. The teacher's gender ( $b=2.377$ ,  $t=0.55$ ,  $p=0.583$ ) was found not to significantly influence school KCPE performance.

#### **4.5.5 Testing the Null Hypothesis that School Examination Levies have no Statistically Significant Effect on Academic Achievement in Public Day Primary Schools in Nyamira County, Kenya.**

The research hypotheses of the study were tested using t-tests provided in various regression analyses. The  $B$  coefficient for internal examination levy ( $b=0.0024$ ,  $t=6.94$ ,  $p<0.0001$ ) was statistically significant. Therefore, the possibility that the population  $B$  coefficient for this variable examination levies that is internal examination levies, divisional examination levies and sub- county mock examination levies was zero was

extremely remote.

Thus, the null hypothesis that school examinational levies have no statistically significant effect on academic achievement in public day primary schools in Nyamira County was rejected and the alternative hypothesis that school examinational levies have statistically significant effect on academic achievement in public day primary schools in Nyamira County was accepted. However, the divisional mock and sub county mock levies were found not to significantly influence school KCPE performance.

#### **4.6 The Effect of Cost of Revision Materials on Academic Achievement in Public Day Primary Schools in Nyamira County**

The fourth objective of the study sought to establish the effect of cost of revision materials on academic achievement in public day primary schools in Nyamira County, Kenya. This study tested the null hypothesis that cost of revision materials have no statistically significant effect on academic achievement in public day primary schools in Nyamira County Kenya. This study therefore modelled the effect of cost of revision materials on academic achievement in public day primary schools using multiple linear regression analysis. To achieve this objective the study first conducted univariate analysis (standard deviations, kurtosis, skewness, and means) for the cost of revision materials in order to describe the variable. The results are presented in section presented in section 4.6.1.

Secondly, the study ran a pair wise correlation to establish how cost of revision materials and head teacher characteristics were correlated with the outcome variable (school KCPE mean score). The results of the bivariate statistics are presented in section 4.6.2. Before

fitting the multiple linear regression, the study conducted the model diagnostic test for the assumptions of multiple regression analysis for testing objective four. The results of the model diagnostic test are presented in sections 4.6.3. The study then fitted a multiple linear regression model to establish the effect of cost of revision materials on academic achievement in public day primary schools while controlling for head teachers' characteristics. The results of the multiple regression analysis are presented in section 4.6.4. Finally, the study tested the null hypothesis that cost of revision materials have no statistically significant effect on academic achievement in public day primary schools in Nyamira County, Kenya. The results are presented in section 4.6.5.

#### **4.6.1 Univariate Statistics for Cost of Revision Materials**

The study sought data from the public day primary school head teachers on the total monies spent by class eight parents to support the school in acquiring revision materials such as past papers, supplementary and revision textbooks for the class eight pupils. The descriptive statistics for monies spent by class eight parents on revision materials is presented in Figure 25.

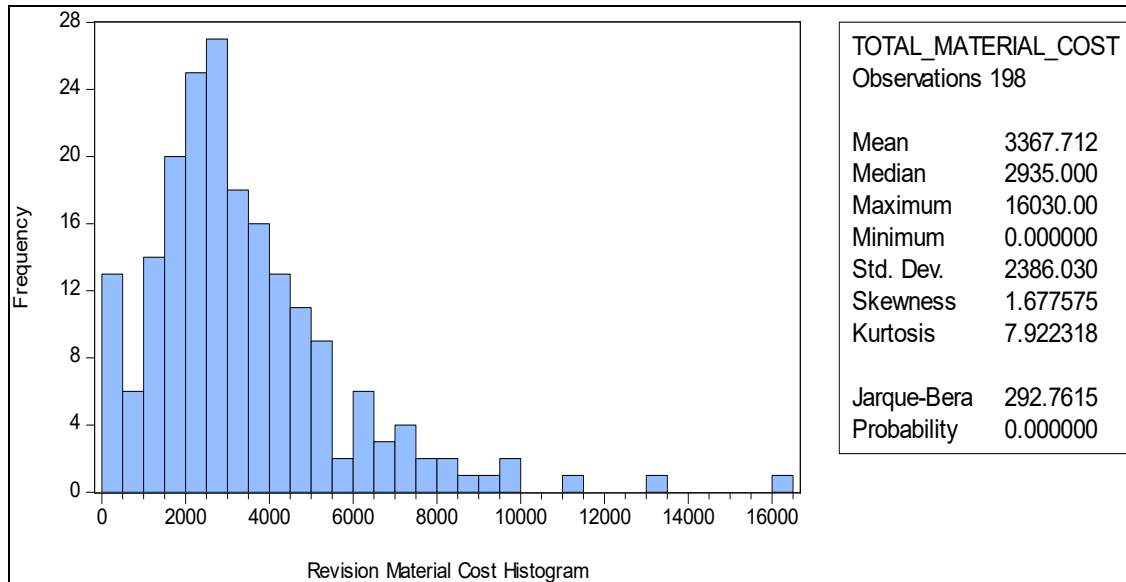


Figure 25: Descriptive Statistics and Histogram of Revision Materials Cost

Source: R Project Output, 2023

The results in Figure 25 indicate that the total cost of revision materials spent by the households for class eight ranged from a minimum of zero to a maximum of Kshs 16,030, with an average cost of Kshs 3,367.71. Head teachers from only 13 schools (7%) answered that households in their schools did not spend any money in buying revision materials, indicating that a predominant proportion of the households in the county do so. The median was Kshs 2,935, which supported the conclusion that most households spend money for buying revision materials. The standard deviation was Kshs 2,386, showing that most households spend between Kshs 981.68 and Kshs 5,753.74 for revision materials, a finding supported by the shape of the histogram. Although, the  $JB = 292.76$ ,  $p < 0.0001$ , indicated non-normality, the skewness (1.68) and kurtosis (7.92) were either within or close to the benchmark  $\pm 2$ , which showed that the data did not greatly depart from normality.

#### 4.6.2 Bivariate Statistics for Cost of Revision Materials and Control Variables

To be able to fit the multiple linear regression model, the study ran two pair-wise correlations. First, the study ran a Pearson’s Correlation Coefficient,  $r$  to establish how the cost of examination materials was correlated with the outcome variable (school KCPE mean score). The results are presented in Table 17.

**Table 17: Correlation between School KCPE Mean and Cost of Revision Material**

Variable (n = 198)		KCPE means	Total revision material cost
KCPE means	R	1	
Total revision material cost	R	0.696	1

Key:  $r$  = Pearson correlation coefficient; \*\*, \* = correlation significant at .01 and .05 levels (2-tailed), respectively.

Source: R Project Output, 2023

The results in Table 17 showed a significant, positive, and strong correlation between the cost of revision materials ( $r=0.696$ ,  $p<0.0001$ ) with school KCPE mean. The findings showed that when the cost of revision materials increases school KCPE mean also goes up and vice versa. The effect of cost of revision material on school KCPE mean is measured using multiple regression analysis in section 4.6.4.

Secondly, the study ran a Pearson’s Correlation Coefficient,  $r$  to establish which control variables were correlated with the outcome variable (school KCPE mean score) in order to pursue in the regression model. The results are presented in Appendix 11. The results indicate that of all the twelve (12) control variables only four (head teachers’ sex, teachers mean age, teachers mean experience and, teacher’s years of schooling) were correlated with school KCPE mean score hence were pursued in the regression analysis.

### 4.6.3 Model Diagnostic Testing for Multivariate Analysis of the Effect of Cost of Revision Materials on School Academic Achievement

The study established whether the data for objective four met the assumptions of the multiple regression model. The study conducted several diagnostic test statistics. The analysis included linearity, normality, homoscedasticity, and outlier's presence to ensure the validity of the results. The diagnostic tests statistics results for linearity, homoscedasticity of the residuals, multicollinearity, and autocorrelation are presented in sections 4.6.3.1, 4.6.3.2, 4.6.3.3, and 4.6.3.4 respectively

#### 4.6.3.1 Linearity

The scatterplot predicting KCPE mean from cost of revision materials and a Lowess smoother is shown in Figure 26.

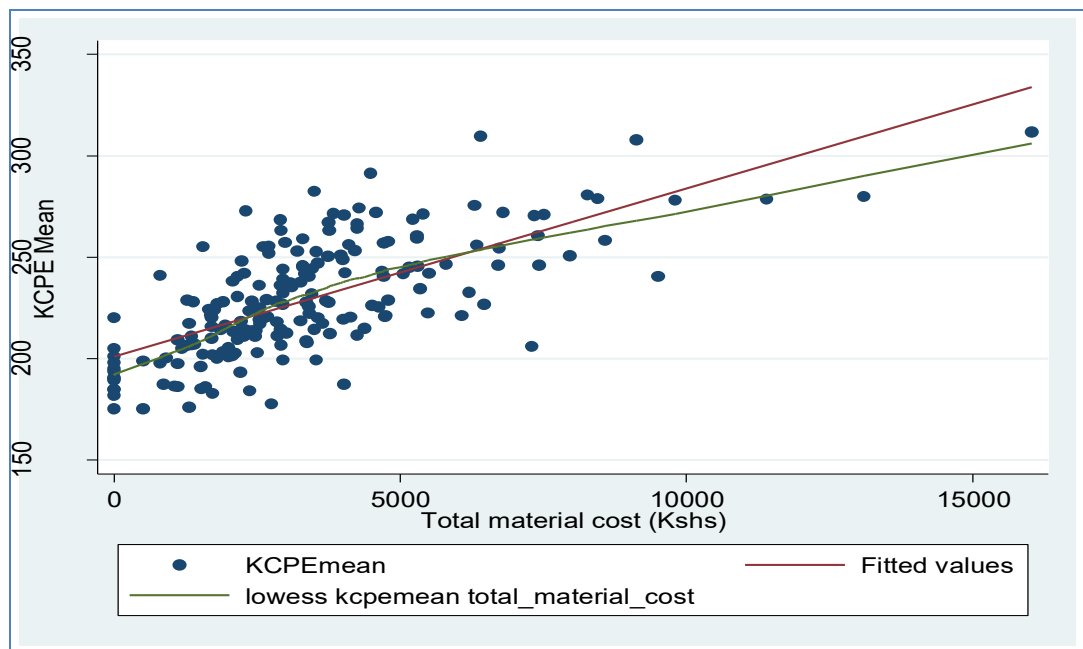


Figure 26: Scatterplot of KCPE and Cost of Revision Materials

Source: R Project Output, 2023

From Figure 26, the curves of predicted values and loess values were relatively straight, suggesting linearity in the data.

#### 4.6.3.2 Homoscedasticity of the Residuals

Figure 27 shows a plot of the residuals versus fitted values.

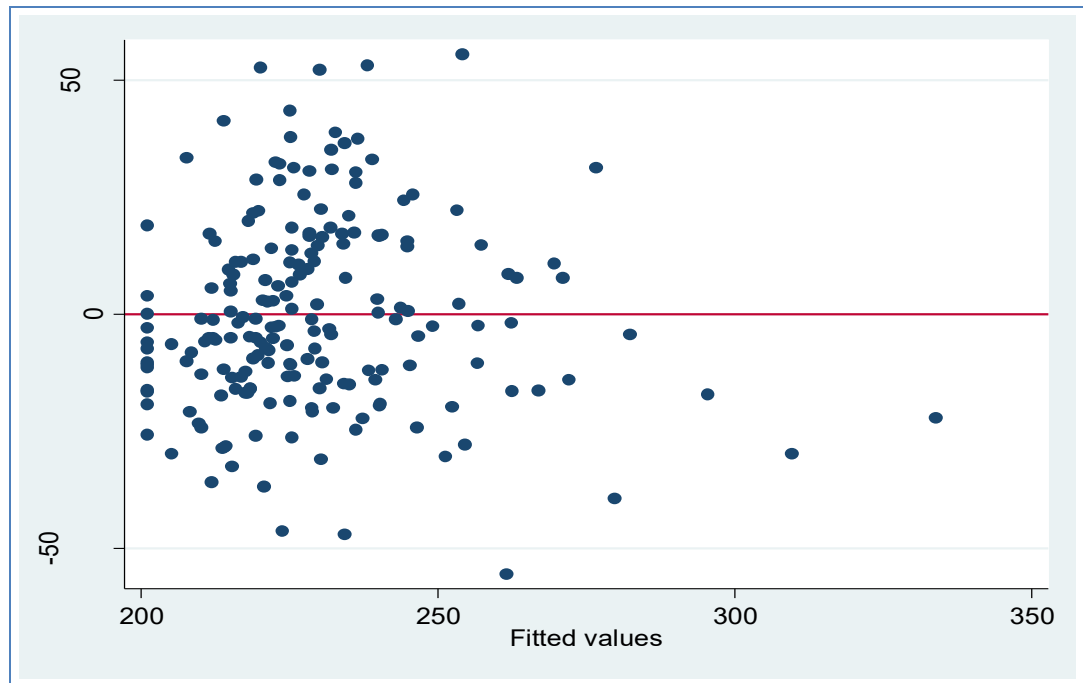


Figure 27: Plot of Residuals Versus Fitted values for Cost of Revision Materials

Source: R Project Output, 2023

The results in Figure 27 show that the residuals for the LR with the cost of revision materials were randomly scattered around the centre line of zero, with no discernible pattern. This suggested that the residuals had a constant variance (homoscedasticity), approximately normally distributed, and independent of another (non-autocorrelated).

The Breusch-Pagan Test,  $\chi^2 (1) = 3.77, p=0.052$ , showed that the null hypothesis of

constant variance in the residuals was accepted. Thus, residuals of the cost of revision materials had homogenous variance.

#### **4.6.3.3 Multicollinearity**

Since there was only one exogenous variable, the cost of revision materials, there was no problem of multicollinearity for this objective. Indeed, computation of tolerance yielded the maximum possible value of one.

#### **4.6.3.4 Autocorrelation**

The Durbin-Watson statistic in this model was 2.119, which showed that the errors were independent.

#### **4.6.4 Multivariate Analysis for the Effect of Cost of Revision Materials on Academic Achievement in Public Day Primary Schools in Nyamira County**

This study used two models to model the effect of cost of revision materials on academic achievement in public day primary schools in Nyamira County. In model 1, the study assesses the effect of cost of revision materials on academic achievement in public day primary schools. In model 2, the study assesses the effect of cost of revision materials on academic achievement in public day primary schools while controlling for head teachers' characteristics.

In the model, the value of the coefficient indicates aggregate mean points in KCPE. The positive sign and negative signs of the coefficient indicate increased and decreased school aggregate points in KCPE respectively. The significance of the relationship between a given explanatory variable and school mean score in KCPE is tested at  $p=0.05$ . The

results of the multiple regression modelling for the effect of school examination levies on academic achievement in public day primary schools is presented in Table 18.

**Table 18: Multiple Linear Regression Results for the Effect of Cost of Revision Materials on School Academic Achievement**

Variable ( <i>n</i> =198)	Model 1				Model 2			
	<i>B</i>	$\beta$	<i>t</i>	<i>P</i>	<i>B</i>	<i>B</i>	<i>t</i>	<i>p</i>
(Constant)	201.008		79.8	<i>p</i> <0.0001	240.46		6.84	<i>p</i> <0.0001
Cost of revision materials	0.0083	0.6959	13.57	<i>p</i> <0.0001	0.0082	0.6877	13.53	<i>p</i> <0.0001
Control Variables								
Sex_2					9.3598	0.1326	2.62	0.009
Mean age					-0.869	-0.077	-1.01	0.313
Mean experience					-0.189	-0.015	-0.2	0.84
<i>R</i> <sup>2</sup>	0.4843				0.5111			
Adjusted <i>R</i> <sup>2</sup>	0.4816				0.5009			
<i>F</i> Change	184.04				50.44			
<i>P</i>	<i>p</i> <0.0001				<i>p</i> <0.0001			

**Key:** *B*= b coefficient (unstandardized),  $\beta$  = Beta (standardized coefficient)

Source: R Project Output, 2023

The multiple regression results in Table 18 indicate that for the first model, the *R*<sup>2</sup> was found to be 0.4843, which means that the cost of revision materials could account for about 48% of the variance in academic performance. Since *R*<sup>2</sup> values above 40% are considered high (Field, 2005), this model could explain a significant amount of variation in school KCPE performance, showing that revision materials affect school KCPE performance by a considerable degree. In comparison the *R*<sup>2</sup>, for motivational, remedial and examination levies in section 4.3.4, 4.4.4, and 4.5.4 were 3%, 10%, and 28%, respectively. This suggested that the cost of revision materials had the largest influence on school KCPE performance, followed by examination, remedial and lastly,

motivational levies. The remaining unexplained variation in school KCPE performance could partly be attributed to other factors not specified in the model and partly to the error term in the regression equation.

In the first model in Table 22, with only the cost of revision materials, the effect of the change was significant,  $F(1, 196) = 184.04, p < 0.0001$ , suggesting that the cost of revision materials was a strong significant predictor of school KCPE performance. In the second model, when controlled variables were added, the R square increased marginally from 48% to 51%, although the effect of the change was significant,  $F(3, 193) = 3.527, p = 0.016$ . This further buttressed the conclusion that the cost of revision materials was a very strong predictor of school KCPE performance.

Adjusted R Square provides information on how well a model can be generalized in the population. If the second model had been derived from the population rather than the sample, then it would have accounted for approximately 50% of the variance in the dependent variable, which was considerable (Field, 2005).

In the final model (model 2) in Table 22, the partial regression coefficient for the cost of revision materials ( $b = 0.0082, t = 13.53, p < 0.0001$ ) was statistically significant. The coefficient for the cost of revision materials was 0.0082, which means that when the cost of revision materials increases by one Kenya shilling, the school KCPE mean goes up by 0.0082 points or by 0.0067% (coefficient of determination =  $r^2 = 0.0082^2$ ), *ceteris paribus*. In other words, increasing the expenditure of revision materials by 100 Kenya shillings improves the school KCPE mean by 0.82 points or by 67%. The results indicate that the cost of revision materials has a large effect on school KCPE performance.

Other than the cost of revision materials, the study found that school KCPE performance is significantly affected by the head teacher's gender ( $b=9.3598$ ,  $t=2.62$ ,  $p=0.009$ ). The results showed that compared to male head teachers (reference category), female head teachers attain on average mean scores of roughly nine points more than male heads and mean age of teachers. On the other hand, the average age of a teacher, ( $b= -0.869$ ,  $t= -1.01$ ,  $p=0.313$ ) and the teacher's experience ( $b= -0.189$ ,  $t= -0.20$ ,  $p=0.840$ ) had no significant effect on school KCPE performance.

An increase of one standard deviation in the cost of revision materials will lead to an improvement in school KCPE performance by roughly 0.688 of its standard deviation, *ceteris paribus*. This result is in line with the study conducted by Manduku, et al. (2018), on the effects of school-based factors on academic performance in public primary schools in Njiru Sub County, Nairobi Kenya. Which concluded that majority of the schools in Njiru do not have enough textbooks which affected their performance

#### **4.6.5 Testing the Null Hypothesis that School Cost of Revision Materials have no Statistically Significant Effect on Academic Achievement in Public Day Primary Schools in Nyamira County, Kenya.**

The  $B$  coefficient for pupils' motivation ( $b=0.0082$ ,  $t=13.53$ ,  $p<0.0001$ ) was statistically significant. It was therefore highly unlikely that the population  $B$  coefficient for this variable was zero. Thus, the null hypothesis that the cost of revision materials have no statistically significant effect on academic achievement in public day primary schools in Nyamira County was rejected. An alternative hypothesis was adopted which was; there is significant effect on academic achievement in public day primary schools in Nyamira

County.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

The main purpose of the research in this section is to display the summary, conclusions, and recommendations made from the statistical analysis and the findings on themes related to the outcomes of school levies and their implication on the KCPE performance of pupils in primary school level. The chapter is arranged into four key areas namely, a summary of major findings of this study on motivational levies, remedial levies, examination levies and cost of revision materials; conclusions reached from statistical analysis of data, given in four themes according to the study's goals; key recommendations for various stakeholders including school management, policy makers, teachers, parents and care givers and finally, the last key area presents suggestions for further research by organizations, scholars and graduate students.

#### **5.2 Summary of Findings**

In this segment of the study's summary, the summary of major outcomes of the study are presented basing on the research objectives. The summaries relate to motivational levies, remedial levies, examination levies and cost of revision materials. The section also put into consideration the findings which exhibit if there exist a statistically significant effects on the achievement of learners in KCPE examination. The first part of this section

presents a summary schools background characteristics in part 5.2.1. In addition, a summary of the outcomes related to motivational levies, remedial levies, examination levies and cost of revision materials. of this research study is presented in sections 5.2.2, 5.2.3, 5.2.4 and 5.2.5 respectively.

## **5.2.1 Descriptive Statistics of Public Day Primary Schools**

### **5.2.1.1 School Characteristics**

50% of public day primary schools in Nyamira County are sponsored by District Education Boards while close to 30% are sponsored by the Catholic Diocese of Kisii (DOK). In addition, eight out of every ten schools in the county lacked a library ( $n=154$ , 78%) relative to only two schools out of every ten that had ( $n=44$ , 22%). Roughly, a half of the sampled schools (48%) run a lunch program for class 8 students while the rest (53%) do not. A large number of the schools were in rural areas (83%) relative to those found in semi-urban (15%) or urban areas (2%). The age of schools ranged from a minimum eight to a maximum 90 years, with a mean age of 44 years. The total school enrolment ranged from a minimum of 102 to a maximum of 956 pupils with an average enrolment of 329 pupils. The results showed that most schools are quite small. The average class 8 enrolment was 34 pupils, ranging from a minimum 13 to a maximum 100 pupils.

### **5.2.1.2 Head Teacher Characteristics**

The response rate for the study was 100% as all the 198 head teachers sampled responded to the questionnaire. Most of the head teachers were male ( $n=158$ , 80%) relative to females ( $n=40$ , 20%) an indication of imbalance in gender in the headship of schools in

Nyamira County. Eight out of every ten head teachers (80%) were on scale 10 (designated head teacher) compared to only two head teachers out of every ten (20%) who were on grade 11 (senior head teacher). The results showed that majority of heads of schools were on a junior scale. The youngest head teacher was 40 years old while the oldest was 60 years, with an average age of 52 years. The results suggest that most head teachers in the county were middle-aged. The average years of service for head teachers was 23 years, ranging from just three years to a maximum of 39 years. The results suggest that head teachers had served for a reasonable period in teaching profession.

#### **5.2.1.3 Teacher Characteristics**

Teacher's average age in sampled schools was 46 years, with a range between 40 and 53 years. The mean teaching experience of teachers was 15 years, with a small standard deviation of just four years. The majority of the educators had been there for about seven years. The outcome of the research study clearly revealed that the duration and length in terms of years of teachers' professional training fell between 14 years and 15 years, indicating that teachers involved in offering instruction to learners in the area covered by this study were either certificate or diploma holders.

#### **5.2.1.4 Sampled Primary Schools KCPE Mean Score**

The KCPE means in public schools in Nyamira County ranged from a minimum of 175.34 to a maximum of 311.70, with an average mean 228.95. The results revealed that performance in most schools was relatively poor. The distribution of the school means was normally distributed.

### 5.2.2 Effect of School Motivational Levies on Academic Achievement

The study analyzed data on motivational levies and the outcome showed that there is a significant, further the outcomes showed a positive but a weak correlation between school KCPE means score and their motivation ( $r=0.160$ ,  $p=0.024$ ). The relationship was positive which showed that when pupils' motivation increases, the school KCPE mean score also increases and vice versa. Nevertheless, the study failed to find significant relationships between academic tours ( $r=0.076$ ,  $p=0.287$ ) and teachers' motivation ( $r=0.040$ ,  $p=0.576$ ) with school KCPE mean score. The results suggested that an increase of the amount levied by one shilling in academic tours or teachers' motivation, there is improvement school KCPE mean score since there is no correlation.

The relationship between pupils' and teachers' motivation was found to be significant, positive and moderate ( $r=0.472$ ,  $p<0.0001$ ), suggesting that schools that collect teachers' motivation levies are also likely to levy pupils' motivation monies. The research study, model a t-tests for research hypotheses testing in various regression analyses. The outcomes of the study showed that the  $B$  coefficient for pupils' motivation ( $b=0.0037$ ,  $t=2.75$ ,  $p=0.007$ ) was statistically significant. From this outcome, it was evident that there was an unlikelihood that the results of the population  $B$  coefficient for motivational levies was zero. It was concluded that, the hypothesis for school motivational levies was not accepted. The alternate hypothesis for the study was therefore accepted. However, the regression coefficients for academic tours ( $b=0.0003$ ,  $t=0.64$ ,  $p=0.520$ ) and teachers' motivation ( $b= -0.0007$ ,  $t= -0.82$ ,  $p=0.414$ ) were not statistically significant at  $p<.05$ . Thus, while motivation of pupils has a significant effect on school KCPE mean score, the

study found no evidence that academic tours and teachers' motivation lead to improved school KCPE mean score.

### **5.2.3 Effect of Remedial Levies on Academic Achievement**

Objective two of the study addressed remedial levies and how they affected the learner's achievement in KCPE examination in sampled primary schools. The study findings from the correlational statistical analysis of the data on remedial levies demonstrated a noteworthy, favorable but not very strong correlation between evening remedial ( $r=0.184, p=0.009$ ) and morning remedial ( $r=0.270, p<0.0001$ ) with school KCPE mean score. The findings showed that when levies for evening and morning remedial increase, school KCPE mean score also goes up and vice versa. Nevertheless, the study failed to find significant relationship between weekend remedial levy and school KCPE mean score ( $r=0.127, p=0.075$ ). The relationship between morning and weekend remedial was found to be statistically significant, with a positive and moderate value of ( $r=0.465, p<0.0001$ ), suggesting that schools that have weekend remedial program are also likely to have morning remedial.

The  $B$  coefficient for evening remedial levies ( $b=0.0006, t=293, p=0.004$ ) and morning remedial levies ( $b=0.0007, t=3.37, p=0.001$ ) were statistically significant. From this outcome of the study the evening remedial levies ( $b=0.0006, t=293, p=0.004$ ) and morning remedial levies ( $b=0.0007, t=3.37, p=0.001$ ), the study suggest that it was therefore to a large extent not possible that the population  $B$  coefficients for evening and morning remedials were zero. Thus, null hypothesis on the school remedial levies was rejected. The alternate hypothesis on the school remedial levies was accepted.

#### 5.2.4 Effects of Examination Levies on Academic Achievement

Objective three addressed the effect of examination levies. Specifically, the research study sought to ascertain whether total amount of money collected from the households in terms of internal exams, divisional mocks and county mocks had an effect on school KCPE mean score. The outcomes from statistical analysis of examination levies, exhibited in the final model, that only the partial regression coefficient for internal examination levy ( $b=0.0024$ ,  $t=6.94$ ,  $p<0.0001$ ) proved to be statistically significant. This showed that when internal examination levy increases by one Kenya shilling, school KCPE mean score goes up by 0.0024 points, *ceteris paribus* or by 0.00058% (coefficient of determination =  $r^2 = 0.0024^2$ ). Put differently, an increase in internal examination levy by Ksh 100 will result in an increase in school KCPE mean score by 0.24 points or about 6%. However, divisional mock ( $b= -0.0005$ ,  $t= -0.23$ ,  $p=0.483$ ) and sub county mock ( $b= -0.0002$ ,  $t= -0.23$ ,  $p=0.615$ ) levies were found to have no significant effect on school KCPE mean score.

The standardized coefficients showed that only internal examination levy ( $\beta = 0.5741$ ) which implied that internal examination levy had a significant effect on school KCPE mean score. These results can be interpreted to mean that, with an increase of one standard deviation in the internal examination levy leads to an improvement in school KCPE mean score by almost 0.5741 basin on the outcomes of its standard deviation, *ceteris paribus*. Among the control variables, only teacher's age ( $b= -1.8677$ ,  $t= -2.71$ ,  $p=0.007$ ) was found to significantly influence school KCPE mean score. This showed that when the age of teacher increases by one year, school KCPE mean score decreases by 1.87 points. The teacher's gender ( $b=2.377$ ,  $t=0.55$ ,  $p=0.583$ ) was found not to

significantly influence school KCPE mean score.

The  $B$  coefficient for internal examination levy ( $b=0.0024$ ,  $t=6.94$ ,  $p<0.0001$ ) was statistically significant. From this outcome of examination levies ( $b=0.0024$ ,  $t=6.94$ ,  $p<0.0001$ ), it is concluded that, the outcome of the statistical analysis of the internal examination levy was to large extent It is implausible that the internal examination levy's population  $B$  coefficient was zero. Thus, null hypothesis for this objective on examination levies was rejected. However, the divisional mock and sub county mock levies were found not to significantly influence school KCPE mean score. Finally the alternate hypothesis of this levy was accepted.

#### **5.2.5 Effect of the Cost of Revision Materials on Academic Achievement**

The fourth objective aimed at addressing the cost of revision materials for learners in primary schools and how the contribute towards their achievement in KCPE examinations. The study sought to ascertain whether the total amount of money spent by the households to purchase revision materials for their class eight pupils had an effect on the school KCPE mean score. The results from the Pearson correction showed a significant, positive, and strong correlation between the cost of revision materials ( $r=0.696$ ,  $p<0.0001$ ) with school KCPE mean score. The findings suggest that when the cost of revision materials increases, school KCPE mean score also goes up and vice versa.

According to the Multiple Linear Regression study, the  $R^2$  value for the first model was determined to be 0.4843, which means that the cost of revision materials could account for about 48% of the variance in school KCPE mean score. Since  $R^2$  values greater than

40% are regarded as high, Field (2005), this model has the potential to explain a large amount of variation in school KCPE mean score, showing that revision materials affect school KCPE mean score by a considerable degree. In comparison the  $R^2$ , for motivational, remedial and examination levies were 3%, 10%, and 28%, respectively. This suggested that revision materials levies had the largest influence on school KCPE mean score, followed by examination, remedial and lastly, motivational levies.

In the final model (model 2), the partial regression coefficient for the cost of revision materials ( $b=0.0082$ ,  $t=13.53$ ,  $p<0.0001$ ) was statistically significant. The coefficient for the cost of revision materials was 0.0082, which means that when the cost of revision materials increases by one Kenya shilling, the average KCPE result at the school increases by 0.0082 points, or 0.0067% ( $r^2 = 0.00822$ ), *ceteris paribus*. In other words, increasing the expenditure of revision materials by 100 Kenya shillings improves the school KCPE mean score by 0.82 points or by 67%. The results indicate that the cost of revision materials has a large effect on school KCPE mean score.

The  $B$  coefficient for pupils' motivation ( $b=0.0082$ ,  $t=13.53$ ,  $p<0.0001$ ) was statistically significant. Therefore, the possibility of the population  $B$  coefficient for this variable being zero was extremely low. Thus, the null hypothesis that the cost of revision materials has no statistically significant effect on academic achievement in public day primary schools in Nyamira County was rejected.

### **5.3 Conclusions of the Study**

The study's findings, which were reported in Chapter 4, led to the following deductions, which were made in accordance with the themes that emerged from the goals of the investigation.

#### **5.3.1 The Effect of School Motivational Levies on Academic Achievement**

The multiple regression analysis's findings after adjusting for each model variable indicate motivation of pupils has a significant effect on the school KCPE mean score, the multiple regression analysis of the study found no evidence that academic tours and teachers' motivation lead to improved performance. It was concluded that the amount of money spent by the households on pupils has a significant effect on the school KCPE mean score. Thus, the more parents spend on motivation the higher the school KCPE mean score.

#### **5.3.2 The Effect of School Remedial Levies on Academic Achievement**

The multiple regression analysis's findings after adjusting for each model variable indicate that evening remedial levies ( $b=0.0006$ ,  $t=293$ ,  $p=0.004$ ) and morning remedial levies ( $b=0.0007$ ,  $t=3.37$ ,  $p=0.001$ ) were statistically significant in explaining variations in the school KCPE mean score. It was concluded that head teachers and parents in public day primary schools should focus more on morning and evening remedial to improve the school KCPE mean score. Any levy associated with weekend remedial was found to be insignificant towards the school KCPE mean score.

### **5.3.3 The Effects of School Examination Levies on Academic Achievement**

The multiple regression analysis's findings after adjusting for each model variable indicate that the  $B$  coefficient for internal examination levy ( $b=0.0024$ ,  $t=6.94$ ,  $p<0.0001$ ) was statistically significant in explaining variations in the school KCPE mean score. It was concluded that the amount of money spent by the households on internal examination has a significant effect on the school KCPE mean score. Thus, the more parents spend on internal examinations the higher the school KCPE mean score. However, the divisional mock and sub county mock levies were found not to significantly influence the school KCPE mean score.

### **5.3.4 The Effect of Cost of Revision Materials on Academic Achievement**

The multiple regression analysis's findings after adjusting for each model variable indicate that the partial regression coefficient for the cost of revision materials ( $b=0.0082$ ,  $t=13.53$ ,  $p<0.0001$ ) was statistically significant in explaining variations in the school KCPE mean score. It was concluded that when household spent more money on revision materials it significantly improves the school KCPE mean score.

## **5.4 Recommendations**

The conclusions reached from the themes under the study's primary objectives led to the following suggestions.

- i. The Ministry of Education, school board of management, head teachers, teachers, parents and guardians should adopt the culture of motivating pupils' in public day primary schools so as to enhance school KCPE mean score.

- ii. The Ministry of Education, school board of management, head teachers, teachers, parents and guardians should encourage public day primary schools to conduct morning and evening remedial so as to boost their school KCPE mean score.
- iii. The Ministry of Education, school board of management, head teachers, teachers, parents and guardians should encourage public day primary schools to conduct as many internal examinations as possible to boost the school KCPE mean score.
- iv. The findings of the present study shows that the cost of revision materials has a large effect on school KCPE mean score. It is therefore recommended that Ministry of Education, school board of management, head teachers, teachers and parents should encourage public day primary schools to spend more money on purchasing revision text book, past papers and other learning materials to improve on their school KCPE mean score.

### **5.5 Suggestions for Further Research**

The following suggestions were made after research findings and discussions because they were not adequately underscored:

- i. The study was limited to Nyamira County. A national study on the same would be necessary to examine the effect of school levies and academic achievement in public day primary schools in Kenya.
- ii. The study established that teacher characteristic as a factor could influence students' academic achievement thus studies should be conducted to establish the influence of teacher's characteristics on academic achievement of learners in public day primary schools.

- iii. This study concentrated on establishing the association between school levies and academic achievement in public day primary school. It thus suggests conducting additional research to determine the effects of different charges in secondary schools on academic achievement.

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Ghana, Kenya, Malawi and Mozambique. Washington: UNICEF

Yego, E. M. (2013). Influence of Teacher Reward System on Employees Output: A Case of Public Primary Schools, Turbo Division, Uasin Gishu County, Kenya  
*Unpublished Master Thesis of University of Nairobi*

## APPENDICES

Appendix 1: Permission Letter to Sampled Public Day Primary Schools

Cliff N Onyancha EPM/H/20/14

P. O. Box 71- 40212

KEUMBU

17<sup>th</sup> January, 2018

Dear Sir/Madam

**REF: RESEARCH ON SCHOOL LEVIES AND ACADEMIC ACHIEVEMENT IN  
PUBLIC DAY PRIMARY SCHOOLS IN NYAMIRACOUNTY**

I am a post graduate student of Masinde Muliro University of Science and Technology pursuing a Doctoral of Philosophy degree in Educational Planning and Management. Your school has been selected to participate in providing useful information for the study.

The information given will be treated in complete confidentiality and will only be used for the purpose of this study.

Your honest responses will be very important since the Ministry of Education and other stakeholders will use the findings to make informed decisions. Your co-operation will be highly appreciated.

Yours faithfully,

Cliff Nyakeya Onyancha

Registration Number: EPM/H/20/14

Department of Educational Planning Management

Masinde Muliro University of Science and Technology

Appendix 2: Head Teachers Questionnaire (HTQ)

<b>PUBLIC DAY PRIMARY SCHOOL HEAD TEACHER'S QUESTIONNAIRE</b>	
QID QUESTIONNAIRE ID [FOR OFFICIAL USE]	<input type="text"/>
SID SCHOOL CODE	<input type="text"/>
<b>SECTION 1: INTRODUCTION AND CONSENT FROM RESPONDENT</b>	
<p>Good morning/afternoon/evening sir/madam. You have been randomly sampled from 392 head teachers in Nyamira County to participate in the survey: <b>School Levies and Academic Achievement in Public Day Primary Schools in Nyamira County, Kenya</b>. The data you provide will not cause any disadvantage to you and will be kept confidential and used only by the researcher for the purpose of this study. Data will be summarized and reported in aggregate terms. The questionnaire is self-administered and you are requested to be as forthright and as honest as possible with your responses. For anonymity, please do not indicate your name or school name on this questionnaire.</p>	

**SECTION 2: SCHOOL LEVIES**

2.1 Kindly, indicate the total amount of money collected at the end of the year from the class eight parents of 2018 as **Motivation Levies** under the following vote heads:

2.1.1 Academic Tours 

--	--	--	--	--	--	--	--

2.1.2 Teachers Motivation 

--	--	--	--	--	--	--	--

2.1.3 Pupils Motivation 

--	--	--	--	--	--	--	--

2.2 Kindly, indicate the total amount of money collected at the end of the year from the class eight parents of 2018 as **Remedial Levies** under the following vote heads:

2.2.1 Weekend Remedial Classes 

--	--	--	--	--	--	--	--

2.2.2 Evening Remedial Classes 

--	--	--	--	--	--	--	--

2.2.3 Morning Remedial Classes 

--	--	--	--	--	--	--	--

2.3 Kindly, indicate the total amount of money collected at the end of the year from the class eight parents of 2018 as **Examination Levies** under the following vote heads:

2.3.1 Internal School Examinations 

--	--	--	--	--	--	--	--

2.3.2 Divisional Mock Examinations 

--	--	--	--	--	--	--	--

2.3.3 Sub-County Mock Examinations 

--	--	--	--	--	--	--	--

2.4 List the Revision material (s) and their unit cost the parents of class eight pupils bought in 2018

	Title of Revision Material	Unit Cost	Number												
2.4.1	<input style="width: 95%;" type="text"/>	<table border="1" style="width: 100%; height: 20px;"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table border="1" style="width: 100%; height: 20px;"><tr><td></td><td></td><td></td><td></td></tr></table>				
2.4.2	<input style="width: 95%;" type="text"/>	<table border="1" style="width: 100%; height: 20px;"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table border="1" style="width: 100%; height: 20px;"><tr><td></td><td></td><td></td><td></td></tr></table>				
2.4.3	<input style="width: 95%;" type="text"/>	<table border="1" style="width: 100%; height: 20px;"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table border="1" style="width: 100%; height: 20px;"><tr><td></td><td></td><td></td><td></td></tr></table>				
2.4.4	<input style="width: 95%;" type="text"/>	<table border="1" style="width: 100%; height: 20px;"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table border="1" style="width: 100%; height: 20px;"><tr><td></td><td></td><td></td><td></td></tr></table>				
2.4.5	<input style="width: 95%;" type="text"/>	<table border="1" style="width: 100%; height: 20px;"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table border="1" style="width: 100%; height: 20px;"><tr><td></td><td></td><td></td><td></td></tr></table>				





Appendix 3: Document Analysis Guide

CID CHECK LIST ID [FOR OFFICIAL USE]
SID SCHOOL ID
DATE OF COMPLETING THIS QUESTIONNAIRE (DD/MM/YYYY)


**SECTION 5: DOCUMENT ANALYSIS CHECK LIST ON TEACHER STAFFING (USE KEY PROVIDED BELOW THE TABLE)**

	5.1	5.2	5.3								5.4								5.5								5.6	
			D	D	M	M	Y	Y	Y	Y	D	D	M	M	Y	Y	Y	Y	D	D	M	M	Y	Y	Y	Y		
1																												
2																												
3																												
4																												
5																												
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7																												
8																												
9																												
10																												
11																												
12																												
13																												
14																												

**KEY**

**5.1** Teachers names other than the principal who were in the school for the period 1st January to 31st December 2018

**5.2** Teachers gender 1=Male, 2=Female

**5.3** Teachers date of birth

**5.4** Teachers date of first appointment by TSC

**5.5** Teachers date of posting in the current school

**5.5** Total years of professional training e.g. Diploma in Education=15, BED graduate =16, Masters=18, PHD=21

Appendix 4: Masinde Muliro University of Science and Technology School of Graduate Studies Authorization



**MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)**

Tel: 056-30870  
Fax: 056-30153  
E-mail: [deansgs@mmust.ac.ke](mailto:deansgs@mmust.ac.ke)  
Website: [www.mmust.ac.ke](http://www.mmust.ac.ke)

P.O Box 190  
Kakamega – 50100  
Kenya

**Office of the Dean (School of Graduate Studies)**

**Ref:** MMU/COR: 509079

**Date:** 10<sup>th</sup> November, 2016

Cliff Nyakenya Onyancha  
EPM/H/20/14  
P.O. Box 190-50100  
**KAKAMEGA**

Dear Mr. Onyancha

**RE: APPROVAL OF PROPOSAL**

Following communication from the Departmental Graduate Studies Committee and the Faculty Graduate Studies Committee, I am pleased to inform you that the Board of the School of Graduate Studies meeting held on 10<sup>th</sup> November, 2016 considered and approved your Doctor of Philosophy proposal entitled: *'School Levies and Academic Achievement in Public day Primary Schools in Nyamira County, Kenya'* and appointed the following as supervisors:

1. Dr. Geoffrey Musera - Department of Education Planning & Management - MMUST
2. Dr. Jason Nyanyi - Department of Education Planning & Management - MMUST

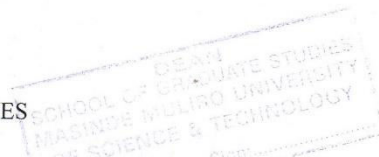
You are required to submit through your supervisor(s) progress reports every three months to the Dean SGS. Such reports should be copied to the following: Chairman, Faculty of Education and Social Sciences Graduate Studies Committee and Chairman, Education Planning and Management. Kindly adhere to research ethics consideration in conducting research.

It is the policy and regulations of the University that you observe a deadline of three years from the date of registration to complete your PhD thesis. Do not hesitate to consult this office in case of any problem encountered in the course of your work.

We wish you the best in your research and hope the study will make original contribution to knowledge.

Yours Sincerely,

PROF. HENRY KEMONI  
EXECUTIVE DEAN, SCHOOL OF GRADUATE STUDIES



Appendix 5: NACOSTI Research Permit


**THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013**

The Grant of Research Licenses is guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014.


**CONDITIONS**

1. The License is valid for the proposed research, location and specified period.
2. The License and any rights thereunder are non-transferable.
3. The Licensee shall inform the County Governor before commencement of the research.
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
5. The License does not give authority to transfer research materials.
6. NACOSTI may monitor and evaluate the licensed research project.
7. The Licensee shall submit one hard copy and upload a soft copy of their final report within one year of completion of the research.
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice.

National Commission for Science, Technology and Innovation  
P.O. Box 30623 - 00100, Nairobi, Kenya  
TEL: 020 400 7000, 0713 788787, 0735 404245  
Email: dg@nacosti.go.ke, registry@nacosti.go.ke  
Website: www.nacosti.go.ke



**REPUBLIC OF KENYA**



**National Commission for Science, Technology and Innovation**

**RESEARCH LICENSE**

**Serial No.A 22450**


**CONDITIONS: see back page**

**THIS IS TO CERTIFY THAT:**

**MR. CLIFF NYAKEYA ONYANCHA**

**of MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY, 0-0 NYASIONGO, has been permitted to conduct research in Nyamira County on the topic: SCHOOL LEVIES AND ACADEMIC ACHIEVEMENT IN PUBLIC DAY PRIMARY SCHOOLS IN NYAMIRA COUNTY for the period ending 4th December, 2018**

**Permit No : NACOSTI/P/17/9055/20325**  
**Date Of Issue : 4th December, 2017**  
**Fee Recieved :Ksh 2000**



**Gratens**  
**Director General**  
**National Commission for Science, Technology & Innovation**

Appendix 6: NACOSTI Permission Letter



**NATIONAL COMMISSION FOR SCIENCE,  
TECHNOLOGY AND INNOVATION**

Telephone: 020 400 7000,  
0713 788787, 0735404245  
Fax: +254-20-318245, 318249  
Email: dg@nacosti.go.ke  
Website: www.nacosti.go.ke  
When replying please quote

NACOSTI, Upper Kabete  
Off Waiyaki Way  
P.O. Box 30623-00100  
NAIROBI-KENYA

Ref.No. **NACOSTI/P/17/9055/20325**

Date: **4<sup>th</sup> December, 2017**

Cliff Nyakeya Onyancha  
Masinde Muliro University of Science and Technology  
P. O Box 190-50100  
**KAKAMEGA**

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on "*School levies and academic achievement in public day primary schools in Nyamira County*" I am pleased to inform you that you have been authorized to undertake research in **Nyamira County** for the period ending **4<sup>th</sup> December, 2018**.

You are advised to report to **the County Commissioner and the County Director of Education, Nyamira County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

**GODFREY P. KALERWA MSc., MBA, MKIM  
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner  
Nyamira County.

The County Director of Education  
Nyamira County.

**REPUBLIC OF KENYA**



**THE PRESIDENCY**

*Ministry of Interior and Coordination of National Government*

Telephone: 020-2012491

Fax: 058-6144446

Email: cc.nyamira@interior.go.ke  
ccnyamira2012@gmail.com.

OFFICE OF THE COUNTY COMMISSIONER

NYAMIRA COUNTY

P.O. BOX 2 - 40500

NYAMIRA

When replying please quote our

**REF: NYRC/ED.2/VOL.II/60**

**DATE: 6<sup>th</sup> December, 2017**

All Deputy County Commissioners  
NYAMIRA COUNTY

**RE: CLIFF NYAKEYA ONYANCHA – MASINDE MULIRO UNIVERSITY  
RESEARCH AUTHORIZATION**

Reference is made to letter Ref. No. NACOSTI/P/17/9055/20325 dated 4<sup>th</sup> December, 2017 from the Director General/CEO, National Commission for Science, Technology and Innovation, Nairobi authorizing *Cliff Nyakeya ONyancha* to carry out research on “*School levies and academic achievement in public day primary schools* in Nyamira County”

This is to inform you that the planned research will be conducted in Nyamira County, upto 4<sup>th</sup> December, 2018.

Kindly accord him the necessary assistance.

GRACE L. NGINDA  
FOR: COUNTY COMMISSIONER  
NYAMIRA

DEPUTY COUNTY COMMISSIONER  
BORABU SUB COUNTY  
20/12/17

Copy to:

✓ National Commission for Science, Technology  
& Innovation,  
P.O. Box 30623  
NAIROBI

County Director of Education  
P.O Box 4  
NYAMIRA

Appendix 8: Ministry of Education Authorization Letter



REPUBLIC OF KENYA

**MINISTRY OF EDUCATION SCIENCE & TECHNOLOGY**

Telephone:  
When replying please quote  
REF: NNED/ADM/VOL2/71  
Email: [nyamiranedu@gmail.com](mailto:nyamiranedu@gmail.com)

SUB COUNTY EDUCATION OFFICE,  
NYAMIRA NORTH  
P.O. BOX 77-40501  
IKONGE

DATE: 28/02/2018

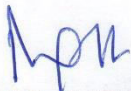
TO ALL HEADTEACHERS

**RE: AUTHORITY TO CONDUCT RESEARCH BY CLIFF NYAKENYA ONYANCHA**

The above named person is a student at **MASINDE MULIRO UNIVERSITY**. He has been given authority by the National Commission for Science, Technology and innovation to conduct research on “**school levies and academic achievement in public day primary schools**” in Nyamira County.

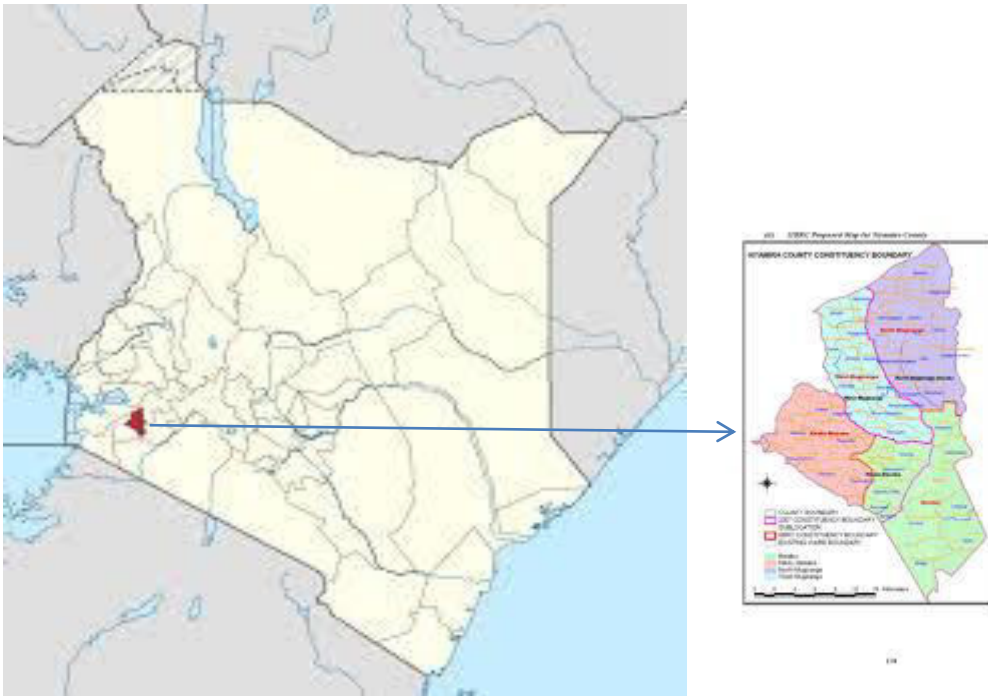
The research will commence immediately and end on 4<sup>th</sup> December, 2018.

Please accord him your assistance.

  
SUB - COUNTY DIRECTOR OF  
EDUCATION  
NYAMIRA NORTH  
P. O. Box 77 - 40501, IKONGE  
MOSES AMOTH  
SUB COUNTY DIRECTOR OF EDUCATION  
NYAMIRA NORTH

**Vision:** A globally competitive education, training, research and innovation system for sustainable development.  
**Mission:** To provide, promote and co-ordinate quality education, training and research; and enhance integration of Science, Technology and innovation into national production systems for sustainable development.

Appendix 9: Nyamira County Map



Appendix 10: MLR Results for School KCPE Performance and Motivational Variables

Controlling for differences in School characteristics

i.library	_Ilibrary_1-2	(naturally coded; _Ilibrary_1 omitted)			
i.lunch	_Ilunch_1-2	(naturally coded; _Ilunch_1 omitted)			
i.location	_Ilocation_1-3	(naturally coded; _Ilocation_1 omitted)			
i.sponsor	_Isponsor_1-4	(naturally coded; _Isponsor_1 omitted)			

Source	SS	df	MS	Number of obs	=	198
Model	16201.9032	12	1350.1586	F(12, 185)	=	1.75
Residual	142867.505	185	772.256782	Prob > F	=	0.0598
				R-squared	=	0.1019
				Adj R-squared	=	0.0436
Total	159069.408	197	807.458923	Root MSE	=	27.79

kcpemean	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
academic_tours	.0002907	.000485	0.60	0.550	-.0006662	.0012476
teachers_motivation	-.0011224	.0009847	-1.14	0.256	-.003065	.0008202
pupils_motivation	.0026968	.0013392	2.01	0.045	.0000547	.0053389
total_cls8	.0024734	.193087	0.01	0.990	-.3784622	.3834089
cls8_classes	17.28354	11.42787	1.51	0.132	-5.262156	39.82923
_Ilibrary_2	-7.813839	5.033967	-1.55	0.122	-17.7452	2.117522
_Ilunch_2	-7.329175	4.067475	-1.80	0.073	-15.35377	.6954245
_Ilocation_2	13.84022	15.36602	0.90	0.369	-16.47493	44.15537
_Ilocation_3	9.787577	14.81513	0.66	0.510	-19.44075	39.0159
_Isponsor_2	-3.236595	4.666591	-0.69	0.489	-12.44317	5.969982
_Isponsor_3	-1.314255	7.201325	-0.18	0.855	-15.52153	12.89302
_Isponsor_4	-11.22685	6.534447	-1.72	0.087	-24.11847	1.664758
_cons	209.1263	19.5119	10.72	0.000	170.6318	247.6207

Appendix 11: Pearson's Correlation between School KCPE Mean and Control Variables

**Table:** Pearson's Correlations between School KCPE Mean and Control Variables

Variable (n = 198)	KCPE means	School pop.	Class 8 size	Class 8 streams	Total teachers	School age	Head's age	Head's service	Mean age	Teachers' experience	School years	Schooling years	FPE Funds
KCPE means	1												
School pop.	0.12	1											
Class 8 size	0.12	0.67**	1										
Class 8 streams	0.16*	0.48**	0.69**	1									
Total teachers	0.15*	0.62**	0.52**	0.46**	1								
School age	0.01	0.26**	0.23**	0.08	0.16*	1							
Head's age	-0.01	-0.02	-0.03	0.09	-0.01	-0.05	1						
Head's service	-0.05	0.05	-0.01	0.14	-0.03	-0.04	0.64**	1					
Teachers' mean age	-0.18*	-0.07	0.09	-0.01	0.02	0.04	-0.05	-0.03	1				
Teachers' experience	-0.19**	-0.05	0.06	-0.05	0.02	0.01	-0.04	0.01	0.9**	1			
School years	-0.1	0.08	0.05	-0.08	0.07	-0.05	-0.07	0.02	0.74**	0.79**	1		
Schooling years	-0.03	0.01	0.03	0.05	0.16*	-0.02	-0.11	-0.06	-0.06	-0.05	-0.05	1	
FPE Funds	0.14	1.0**	0.66**	0.48**	0.61**	0.26**	-0.04	0.04	0.06	0.05	0.09	-0.01	1

**Key:** pop.=Population; \*\*, \* = correlation significant at .01 and .05 levels (2-tailed), respectively