# Effect of Institutional Resources on Student Academic Achievement in Kakamega County, Kenya

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## ABSTRACT

*The school environment has a substantial impact on the quality of education. A well-resourced, supportive, and positive environment can result in enhanced student outcomes, both academically and personally. This study sought to investigate the effect of institutional resources on student academic achievement Kakamega County, Kenya. The research employed the production function theory. The study was conducted using a descriptive correlational research design. This study took place in Kakamega County, which has thirteen sub-counties. The study focused on 423 secondary schools, which included 2 national schools, 2 national special schools, 28 extra county schools, 45 county schools, and 346 sub county schools. The target population included 423 Principals, 5514 teachers, and 182,893 learners, for a total of 188,830 respondents in Kakamega County secondary schools. Purposive sampling was used to choose special and national schools. The Yamane formula was used to determine a sample of 440 respondents. The study gathered data through interviews and questionnaires. A pilot study was conducted in Bungoma County to test the instruments' validity and reliability. Cronbach's alpha was employed as a statistical tool to assess reliability. The study analyzed quantitative data using Regression analysis. Qualitative data was analysed thematically. The results indicated that most of the institutions have resources that included classrooms, laboratories, libraries and others however they were not adequate. The results further revealed that most of the schools have adequate number of teachers while a sizeable were still struggling with fewer teachers. On the study's hypothesis, H01 that states that there is no statistically significant effect of institutional resources on student academic achievement in Kakamega County, Kenya was rejected at p=0.003. The study concluded that there is a significant positive relationship between institutional resources and student academic achievement in Kakamega County, Kenya. The study thus recommends that the Ministry of Education and other stakeholders to enhance funding for school infrastructure, learning materials, and teacher training to improve student achievement. Implement strategies to boost student achievement and optimize teacher-student ratios like recruiting more teachers and teacher interns to fill the gaps.*

**Keywords**: Quality of Education, School Environment, Student Achievement

## I. INTRODUCTION

Government involvement in education of its populace is an indisputably desirable initiative towards realization of economic growth and overall national development. Education enables individuals to acquire knowledge, skills, abilities and competencies which they mix with training and experience to become more productive. Collectively an educated population contributes to increased national productivity, prosperity and overall national development. This variable justifies the huge investments that governments all over the world make in education (Maiyo & Bawane, 2016).

According to the United Nations International Children's Emergency Fund (UNICEF), learner environment promotes schools to work for the benefit of their students, with instructors providing a safe, healthy, and protective environment. The strategy promotes the availability of suitable resources that enhance the physical, emotional, and social conditions for learning. In addition, the learner's rights and a learning environment that respects their identity, interests, and needs are highlighted (Ngugi & Muthima, 2017).

In Europe, Finland's education system serves as a prominent example of learner-centered practices. Finnish schools emphasize student autonomy, individualized learning, and minimal standardized testing. Teachers are highly trained to support diverse learning needs and foster a nurturing environment that prioritizes student well-being. This approach has resulted in Finland consistently ranking among the top countries in educational performance and student satisfaction. The focus on creating a supportive and inclusive atmosphere helps students develop critical thinking and problem-solving skills, contributing to their overall academic success (Sahlberg, 2011).

In South America, Brazil has made significant strides with its "Escola Amiga" (Friendly School) initiative, which focuses on creating safe and inclusive learning environments. The program aims to combat school violence and

promote student engagement by implementing restorative practices and fostering positive relationships between students and teachers. By providing training for educators and involving the community in school activities, Brazil seeks to enhance educational outcomes and create a more supportive atmosphere for students (Silva de Lima et al., 2017). This initiative reflects a broader commitment to improving school environments across the continent.

In North America, Canada has also made noteworthy advancements with its emphasis on inclusive education. The Canadian approach includes policies designed to accommodate diverse learning needs and ensure equitable access to educational resources for all students. Initiatives such as the "Inclusive Education Strategy" focus on integrating students with disabilities into mainstream classrooms and providing necessary support services. These efforts are aimed at creating a more equitable educational environment where every student has the opportunity to succeed (Battiste, 2018). Canada's focus on inclusivity and accessibility highlights its commitment to fostering a supportive and effective learning environment across its educational system.

In Nigeria, the adoption of LFS has fostered a passion for education and fostered harmony between the school community and greater society (Olagboye, 2004). The learning atmosphere at school is important for academic knowledge. This environment consists not only of physical features, but also of the norms, expectations of the overall system, and the pattern of grouping for teaching and learning, which makes the classroom a crucial location for the social and academic growth of the students (Pierce & Stacy, 2013).

In Uganda, both teachers and administrators have received systematic professional development in learner-centered pedagogies, how to establish a learner-friendly environment, psychosocial education, and constructive disciplinary measures (Oduro, 2009). These activities have greater benefits for students and youth. The benefits include promoting increased levels of youth dedication and involvement in education, which leads to a longer time spent in school and ultimately higher test results.

In Kenya, the 2010 Constitution's bill of rights enshrines the learner friendly schools principles (Republic of Kenya, 2010). The Basic Education Act was passed as a policy framework for prosperity in education sector. The state has also established a number of laws and developed a number of policies to promote the learner-friendly school idea. Following the guiding principles, basic education is free and mandatory for all learners of school age (Republic of Kenya [RoK], 2019). Hence, additional resources have been allocated to the education sector.

The law's nondiscrimination policy ensures equality and freedom from discrimination (RoK, 2010) and obligates the State to implement affirmative action initiatives to ensure that minorities and marginalized groups receive particular chances in education. The Constitution of 2010 ensures that every student has the right to be safeguarded from abuse, neglect, detrimental cultural practices, all forms of violence, cruel treatment and punishment, and hazardous or exploitative labor (RoK, 2019). The law also protects learner friendly schools by granting students the right to a safe and violence-free environment.

However, implementation presents numerous obstacles. There is congestion in tuition and boarding facilities at numerous schools. The tiny size of classrooms contributes to decreased concentration during academic education. In Kenya's public schools, a poor education is typically provided, regardless of exam achievement (Chepkonga, 2017). Furthermore, some schools lack basic facilities such as ramps for learners with disabilities, lower door handles, or any environmental adaptation for special needs learners (Ngugi & Muthima, 2017). Also, there is lack of access to resources, including technology. There is much more action lacking in ensuring a 100% LFS environment in Kenyan schools.

Failure to satisfactorily institutional resources can partly be blamed on poor academic achievement by students in Kakamega County. According to statistics, in the year 2017 only 2081(7.3%) candidates out of 28,353 scored C+ and above. In 2018 there were 3,961(12%) out of 31,117. 1n 2019 there were 2343(7%) out of 33299, and in 2020 only 6749 (18.5%) managed mean grade C+ and above (RoK, 2019). The trend shows that indeed students do not achieve high scores in Kakamega County. Partly, this can be attributed to lack of institutional resources despite global and national efforts to implement well equipped schools to enhance educational outcomes. This persistent challenges highlight a critical need to examine the effect of institutional resources on students' academic achievement in Kakamega County. .

### 1.1 Statement of the Problem

The Government of Kenya is dedicated to fostering a friendly school environment through extensive educational reforms and adherence to international conventions. This commitment is evident in initiatives like the Education for All (EFA) goals, aimed at improving educational participation and outcomes. The 100% Transition Policy mandates that all children in Kenya must be enrolled in primary and secondary education, moving toward universal primary education. While this policy is a significant step, it has highlighted challenges related to the learning environment, which can affect educational quality.

In Kenya, the quality of education is often assessed through the Kenya Certificate of Secondary Education (KCSE). Ideally, high KCSE scores would reflect a robust education system. However, statistics reveal a troubling trend: only a small fraction of students achieve grades of C+ and above, considered indicative of high academic achievement. For example, in 2017, only 15% of KCSE candidates scored C+ or higher, with percentages ranging from 11% to 17% in subsequent years. In Kakamega County, these figures are even lower, with 7.3% of students achieving C+ or above in 2017, fluctuating between 7% and 18.5% in the following years according to Kenya National Examination Council (KNEC, 2022).

Despite some incremental improvements, poor academic achievement persists, raising questions about the impact of the school environment on student outcomes. A satisfactory school environment encompassing physical infrastructure, accessibility to materials, teacher-student interaction, safety, and overall ambiance plays a crucial role in educational achievement. Many schools, particularly those with limited resources or overcrowded conditions, fail to provide an optimal learning environment. This creates disparities in student academic achievement both within and across schools.

Research indicates that factors such as low parental education, low income, non-conducive school environments, and insufficient learning materials contribute to subpar academic results. To address these issues effectively, it is essential to investigate how specific aspects of the school environment such as infrastructure, emotional and social support, and resource availability affect student success. Understanding these relationships is crucial for educators, policymakers, and stakeholders to develop targeted interventions and allocate resources efficiently. It is on this backdrop that the current study aims to explore the extent to which the school environment influences academic achievement in Kakamega County, Kenya.

### 1.2 Research Objective

The purpose of this study was to explore the effect of institutional resources on student academic achievement in Kakamega County, Kenya.

### 1.3 Research Hypothesis

$HO_1$: Institutional resources has no statistically significant effect on student academic achievement in Kakamega County, Kenya

## II. LITERATURE REVIEW

### 2.1 Theoretical Review

The study based its approach on the production function theory, emphasizing the causal link between educational resources and student academic achievement.

#### 2.1.1 Production Function Theory

The Production Function Theory represents a fundamental principle in economics, especially within the realm of microeconomics, and has its roots in the initial explorations of the correlation between inputs and outputs in production methodologies. One of the key advocates of this theory is Jean-Baptiste Say, a French economist who pioneered the notion of production as a process of integrating inputs to generate outputs in the early 19th century. Nevertheless, it was subsequently formalized in the 1920s by Paul Douglas and Charles Cobb, who devised the Cobb-Douglas production function (Hanushek, 1987). Their publication from 1928 established one of the most recognized production functions within the field of economics. The Cobb-Douglas production function elucidates the interplay between multiple inputs, commonly labor and capital, and the resultant output generated.

The Production Function Theory in Education applies the principles of production functions from economics to the realm of education. This analysis explores the interplay between various educational inputs—such as educators, instructional resources, infrastructure, and student attributes—and the resultant educational outputs, including student achievement and performance metrics. The application of the theory to education gained prominence through the work of economist Eric A. Hanushek during the 1970s. Hanushek (1987) a pivotal paper entitled "Conceptual and Empirical Issues in the Estimation of Educational Production Functions," examined the influence of various educational resources and inputs on student achievement. The research established a crucial basis for comprehensive empirical investigations in the field of education economics, examining the efficiency and effectiveness of schools and various educational institutions in achieving favorable outcomes, including student learning and skill acquisition.

This theoretical framework was instrumental in exploring how various inputs into the educational process, such as the school environment, affect student outcomes in Kakamega County. The idea behind the Education Production Function (EPF) is that there is a process in education, or that there is a causal link between educational

resources and student academic achievement (Monk, 1989). By applying this theory, the study aimed to uncover how different elements of the school environment, such as infrastructure and teacher quality, contribute to student academic achievement.

Results interpretation often requires a unique understanding of the term "production function" (Hanushek, 1987). The EPF provided a structured approach to evaluating the relationship between educational inputs and outputs, guiding the study's examination of how school environments impact academic success. The technical link between inputs and outputs is represented by a production function, which expresses the maximum output for any possible combination of inputs (Krugman, 2009). This conceptual lens allowed the study to systematically analyze how various aspects of the school environment in Kakamega County influence educational achievement. The Education Production Function (EPF) is a theoretical framework employed to comprehend the manner in which different factors in the educational process (such as the competencies of teachers, the state of school infrastructure, the level of parental engagement, and the impact of peers) result in outcomes, commonly assessed as the academic achievement of students. This framework was essential in identifying the specific elements within Kakamega County schools that contribute to or hinder student success, thus providing a comprehensive view of the educational environment's effect on academic outcomes.

The theory posits that schools operate as a production system, wherein the quality and quantity of educational results are determined by inputs such as teacher quality, student characteristics, and school environmental factors. This perspective was used to assess how factors like physical infrastructure and school climate impact student achievement in Kakamega County, aligning with the study's goal of understanding and improving educational outcomes. According to the EPF, one important factor that may have an impact on student achievement in the context of school environments is the standard of the social and physical surroundings in which children learn. By focusing on these elements, the study aimed to identify how various aspects of the school environment, including safety, infrastructure, and access to resources, affect academic achievement.

The theory elucidates the manner in which several elements of the educational setting, when coupled with additional factors such as the caliber of teachers and the level of student effort, generate diverse degrees of academic achievement. This hypothesis guided the study in evaluating how Kakamega County schools' environmental factors interact with other variables to influence student achievement. Student achievement is influenced by several aspects of the school environment, which include: The quality of physical infrastructure, including classroom space, lighting, climate management, and technology access, can significantly impact students' ability to absorb and integrate information. By examining these aspects, the study sought to determine how the physical and social aspects of schools in Kakamega County affect student achievement.

The educational environment exerts a considerable influence on student achievement through several complex mechanisms: Cognitive Pathways; an intentionally organized and well-equipped educational setting immediately boosts students' capacity to interact with the curriculum, resulting in better cognitive achievements. The study aimed to explore these mechanisms by examining how well-organized school environments in Kakamega County affect students' academic engagement and outcomes. Public health and overall wellness; an immaculate, secure, and nurturing school atmosphere enhances both physical and mental well-being, therefore facilitating learners' consistent attendance and concentration on educational pursuits. The study considered how the overall wellness provided by the school environment in Kakamega County supports students' academic achievement.

The theory of the Education Production Function offers a useful perspective to analyze the influence of the school environment on the academic achievement of students. Viewing the school environment as a crucial factor in the educational production process, the theory emphasized the need to allocate resources to improve school facilities, resources, and social support systems, providing actionable insights for enhancing student achievement in Kakamega County. Production function theory, which posits that people's knowledge and abilities, which they gain via education and experience, generate wealth for society, is related to the factors under investigation here.

### 2.2 Empirical Review

Institutional resources contribute remarkably towards a learner achievement. According to Mensah (2020), learner environment requires a number of facilities such as classrooms, hostels, dining areas, adequate teaching learning materials, Institutional resources include safe and healthy and protective school premises, sufficient teaching learning equipment, adequate well designed and comfortable toilet facilities which are mindful of gender issues as well as taking into consideration of students with special needs (Orkodashvili, 2010). The aforementioned resources need to be supported by sufficient water, soap and sufficient time allocated for the students to attend to the call of nature. Availability of these facilities encourages a hygienic behavior (Abdullahi et al., 2021). This source highlights the importance of institutional resources and their impact on the learning environment. The study related to Kakamega

County filled a gap by assessing how the availability and quality of these resources specifically influence student academic achievement in this region.

Hanushek (1987) highlighted the significance of school inputs, namely the environment, in influencing variations in academic achievement, even after accounting for family background and individual student traits. This research was pivotal in informing the study's analysis of how school environment factors in Kakamega County affect student academic achievement beyond individual and familial variables.

The study conducted by Uline and Tschannen-Moran (2008) provided evidence that the quality of school amenities has a substantial influence on students' opinion of their learning environment, thereby influencing their academic achievements. This finding was used to evaluate how improvements in school facilities and resources could impact student achievement in Kakamega County.

Akomolafe and Adesua (2015) examine the influence of the classroom environment as a significant motivator in improving the academic performance of secondary school students in South West Nigeria. The research employed a descriptive survey methodology. The participants in this study include all students enrolled in senior secondary schools located in the South West region of Nigeria, encompassing the states of Lagos, Ogun, Osun, Oyo, and Ekiti. The sample for this study consisted of one thousand and fifty senior secondary school students, selected from three states within the six states of the South West Geo-political zone. The selected states for analysis are Osun, Ondo, and Ekiti. The investigator employed a questionnaire and an inventory to gather data. A self-constructed questionnaire titled "Motivation and Academic Performance of Senior Secondary School Students" (MAPSSS) was employed to gather information from the participants. The findings indicated a noteworthy correlation between the classroom environment and the academic performance of senior secondary school students. The findings further indicated that for the Government, as the overseer of public secondary schools, to construct adequate, contemporary, and conducive classrooms, while also undertaking renovations of those that are in a state of disrepair. Furthermore, educators should strive to create a classroom environment that is both comfortable and functional, thereby facilitating enhanced academic performance and improved student behavior. The current study sought to examine the effect of institutional resources on academic achievement of students in Kakamega County.

Ndlovu (2018) examines the impact of educational resources on student performance in mathematics within the context of Zimbabwe, employing a 3-Level Hierarchical Linear Model (HLM) for analysis. The principal conclusions of the research indicate that a teacher with specialized training in the pertinent subject, smaller class sizes, the presence of a highly qualified school head, and an overall abundance of resources at the school level contribute positively to student test scores. Nonetheless, the possession of textbooks was regarded as a trivial determinant of student success. The findings suggest that the resources possessed by educational institutions significantly influence student test scores, indicating that greater value and attention ought to be directed towards the activities within schools, alongside enhancing the quality of human resources at the school level. The study, however, exhibits a limitation in that it does not comprehensively investigate all potential determinants at the school and class levels that influence student achievement, owing to constraints in the available data.

Mulinge (2017) carried out a study to ascertain the impact of laboratory facilities on the academic performance of students in science subjects at public secondary schools in Machakos Sub-County, Kenya. The research concentrated on four principal aims: the accessibility of laboratory facilities, the degree to which educators utilize these resources in their instruction, the correlation between laboratory facilities and student achievement, and the obstacles encountered by administrators in supplying laboratory resources. The investigation was driven by the subpar performance of students in scientific disciplines within the region. The research utilized a descriptive survey design and implemented purposive sampling to identify one national school, one extra-county school, and two county schools, alongside simple random sampling to choose 21 sub-county schools. A total of 23 principals, 105 teachers, and 351 students from form three took part in the event. The collection of data involved the administration of three distinct sets of questionnaires tailored to various respondent groups. The subsequent analysis was conducted utilizing the Statistical Package for Social Sciences (SPSS), with the findings meticulously presented in the form of tables, graphs, and percentages. Notable discoveries revealed a substantial correlation between the accessibility and utilization of laboratory facilities and the academic performance of students in scientific disciplines. The utilization of laboratory resources by educators was observed to enhance student outcomes, whereas the presence of large class sizes presented a significant challenge for principals in maintaining sufficient facilities. The research suggested that school administrators engage with parents and various stakeholders to emphasize the importance of ensuring sufficient laboratory facilities. It further underscored the necessity for enhanced training for science educators and increased opportunities for students to engage in practical laboratory experiences. Furthermore, it was suggested that the government provide financial assistance for laboratory equipment and promote local manufacturers to create cost-effective supplies.

## III. METHODOLOGY

### 3.1 Research design

The study was conducted using a descriptive correlational research design. This design was appropriate for this study since it enabled the researcher to evaluate the links between institutional resources, and student academic achievement in Kakamega County, Kenya. In addition, it served as the foundation for selecting variables for subsequent statistical analyses, such as regression analysis.

### 3.2 The Study Area

This research was undertaken in Kakamega County, Kenya, which is made up of thirteen sub-counties: Likuyani, Matete, Navakholo, Lugari, Khwisero, Butere, Matungu, Mumias West, Mumias East, Kakamega Central, Kakamega East, Kakamega South, and Kakamega North. The county's latitude is 0.2842200 degrees and its longitude is 34.7522900 degrees. It encompasses 3,033.8 km2 and is bordered by Trans Nzoia County in the north-east, Bungoma County in the north, Busia County in the west, Siaya County in the south-west, Vihiga County in the south, Nandi County in the south-east, and Uasin Gishu County in the east (RoK, 2010).

This research focused on secondary education in Kakamega County, Kenya, a region characterized by diverse schools, a large youth population, and varied landscapes including urban, suburban, and rural areas. Kakamega County is centrally located, cosmopolitan, and equipped with developed ICT infrastructure, making it an ideal representation of the national educational situation. The study leverages the researcher's local expertise to examine the impact of the school environment on student academic achievement, particularly addressing the high incidence of low KCSE grades from 2016 to 2019. Compared to neighboring counties, Kakamega presents unique challenges and opportunities, making it a priority for educational improvement aligned with national goals like the Big Four Agenda and Vision 2030.

### 3.3 Target Population

This study targeted 423 public secondary school administrators, 423 secondary school teachers, and 182,893 secondary school students in Kakamega County, totaling to 188,830 as indicated in Table 1.

**Table 1**

*Distribution of Target Population in Kakamega County*

| Type of Institution | No. of institutions | No. of Principals | No. of Teachers | No. of Students | Total population |
|---|---|---|---|---|---|
| National Secondary Schools | 2 | 2 | 124 | 4,181 | 4309 |
| National Special secondary Schools | 2 | 2 | 35 | 308 | 347 |
| Extra County Secondary Schools | 28 | 28 | 897 | 28,251 | 29204 |
| County Secondary Schools | 45 | 45 | 766 | 24,261 | 25,117 |
| Sub County Secondary Schools | 346 | 346 | 3,692 | 125,892 | 130276 |
| **Total** | **423** | **423** | **5514** | **182,893** | **188,830** |

Source: Kakamega County Education Office, 2021

Table 1 indicates that there are 423 public secondary schools in Kakamega County. There are 2 national schools, 2 national special schools, 28 extra county schools, 45 county schools, and 346 sub county schools. There are 423 principals, 5514 teachers, and 182,893 students giving a total sum of 188,830 respondents in Kakamega County secondary schools.

### 3.5 Sample and Sampling Procedure

This study employed a combination of stratified random sampling and purposive sampling to select respondents from secondary schools in Kakamega County. Stratified random sampling was used to ensure a representative sample by dividing the population into sub-groups, such as extra-county, county, and sub-county schools, as well as boys', girls', mixed, day, and boarding institutions. The respondents included principals, teachers, and students, whose roles and perspectives were critical given their involvement in the education system. Purposive sampling was also utilized to select two national school principals and two national special school principals for in-depth analysis. This approach allowed the study to capture data-rich examples and ensure a thorough exploration of the research questions. The investigator first determined the sample size using the Yamane formula. When the number of people to be studied is known to be finite, the formula can be employed (Yamane, 1967). The equation is displayed below.

$$n = \frac{N}{1 + N(e)2}$$

Where:
n is the sample size
N is the population size
e is the desired precision level of 0.05 with desired confidence level of 95%.
n = 188,830
1 +188,830(0.052)
n = 188,830 = 399.2 =399
473.14.
n is thus approximately 400.

According to Lavrakas (2008), there is a 10% non-response rate probability hence addition of 10% of 400=40.

n = 400+40= 440

Therefore, out of a target population of 189, 253 the sample size was 440 respondents. Table 2 shows the sample sizes for respondents who were interviewed for this study.

**Table 2**
*Sample of size of Respondents in Kakamega County*

| Respondent | Sample size | Sampling Technique |
|---|---|---|
| Principals of national schools | 2 | Purposive sampling |
| Principals of national special schools | 2 | Purposive sampling |
| Other Secondary school principals | 18 | Stratified random Sampling |
| Secondary school teachers | 25 | Stratified random Sampling |
| Secondary school students | 393 | Stratified random Sampling |
| **TOTAL** | **440** | |

Table 2 above, shows the distribution of respondents according to strata. The table indicates that purposive sampling was used to pick 2 principals of national schools and 2 principals of national special schools. Stratified random sampling selected 18 principals from other categories of secondary schools, 25 teachers and 393 students. The total sampled respondents were 440.

### 3.6 Instruments of Data Collection

The study used primary data based on questionnaires and interviews as instruments of data collection. The study used questionnaires as data collection instruments to get primary data from principals, teachers and Form Four students in secondary schools. The questionnaires required the participants to respond to questions which sought to answer questions arising from the hypotheses on the effect of learner school environment and student academic achievement in Kakamega County.

The questionnaires sought to get information on demographic data of respondents and the research objectives provided guidance in designing of these questionnaires. Closed ended questions were used to limit the number of responses to help the researcher get straight forward and uncomplicated information. Responses to the objectives were rated using a 6-point multi-item Likert scale with anchors labeled SA = Strongly Agree, A= Agree, D =Disagree, SD= Strongly Disagree, DK= Don't Know, and NA= Not applicable, where the respondents were to indicate by ticking appropriately the extent to which they agree with the statements given.

Principals and teachers were interviewed during semi-structured sessions ranging from 40 to 60 minutes in duration. In order to ascertain their expertise in the practical integration process, principals were interviewed. The interview schedules included open-ended questions to facilitate in-depth exploration of the responses and to extract significant information.

### 3.7 Quality Controls

For the instruments to be used for this study, the researcher confirmed their validity and reliability. The validity of a measuring tool and the veracity of the results are two aspects of research instrument validity (Venkatesh et al., 2013). The reliability analysis verifies the dependability of the study's measuring devices (Sekaran & Bougie 2013). Two secondary schools in Bungoma County served as the sites for the study's pilot testing of its research tools. The

pilot study used questionnaires to collect data from 10% of the sample as per the rule of thumb (Cooper & Schneider, 2014).

### 3.7.1. Pilot Study

A pilot study was carried out at four public schools located in Bungoma County. A random selection of schools was made from four distinct categories: National, Extra-County, County, and Sub-County. The pilot evaluation included a cohort of 40 students, 4 principals and 4 teachers. A sample size of 48 participants was employed in the pilot study.

Forty questionnaires were disseminated to students with the aid of school personnel. Among the 40 questionnaires issued in the field, 37 were returned, indicating a response rate of 93%. The return rate for questionnaires among teachers was 4 (100%). The interview procedure included the involvement of all four principals from the chosen schools, comprising both face-to-face interviews and telephone interviews.

After careful analysis of the completed surveys, it was determined that certain questions displayed vagueness, ambiguity, and grammatical issues. Assistance from language specialists was provided to aid the correction of grammatical errors. A number of questions were determined to be inconsistent with the declared research objectives. In order to improve clarity, the interview guide was modified by rearranging specific questions. It was essential to evaluate the items' clarity, ambiguity, and correctness through the pilot research. These items were modified to improve the efficacy of the study tools.

### 3.7.2 Validity of the study Instruments

Questionnaires were subjected to content and face validation with the oversight of supervisors. Prior to its deployment in the field, the device underwent modifications in response to input received from experts. A content validity assessment was conducted in this study to determine the degree to which the test items effectively reflect the material that the test aims to evaluate.

### 3.7.3 Reliability of the Research Instruments

An estimation of the Cronbach alpha coefficient was performed for the Overall Questionnaire scale. The criteria established by Eshiwani (1993) served to evaluate the Cronbach's alpha coefficient. A coefficient of >.9 is considered exceptional, >.8 is considered good, >.7 is considered acceptable, >.6 is uncertain, >.5 is considered bad, and >.5 is considered unsatisfactory. The obtained Cronbach's Alpha value of 0.70 in this study suggests that the items being tested have a satisfactory level of internal consistency.

### 3.8. Data Collection Procedure

Before data collection, the researcher obtained approval from MMUST to apply for research permission from NACOSTI. An introduction letter was provided to collect data from secondary school students. The 'drop and pick' method was used by the researcher and assistants, allowing respondents up to one week to complete the questionnaire before collection. This method was deemed appropriate considering the questionnaire length, respondent accessibility, and the geographical distribution of the sampled schools.

### 3.9 Data Analysis

Descriptive and inferential statistics were employed to gather and examine data of both qualitative and quantitative nature. Prior to data processing, coding was performed based on the nature of the data, with quantitative data being encoded using numerical values. The qualitative data was structured in a narrative style and examined based on major themes. A regression analysis was employed to ascertain the presence of statistically significant variations in means between the school environment and the learner achievement. The opinions of respondents were described and summarized using descriptive statistics, including frequency, percentages, mean values, and standard deviation, in accordance with the study's objectives. Software version 20 of SPSS facilitated data analysis. The hypothesis was tested at a significance level of 5%.

### 3.9.1 Analysis of Qualitative Data

Qualitative data collected from interviews and open-ended questions was analyzed by classifying it into thematic categories. This research tool is used to determine the presence of particular words or concepts within textual resources or collections of texts. A comprehensive transcription of all interview responses has been finalised. Subsequently, the data was categorized according to the objectives, and then a comparison of replies across different participants was conducted to detect shared characteristics and patterns within specific population groupings. The results were ultimately consolidated into narrative reports for the purpose of summarizing the analysis. A coding

procedure was applied to the transcriptions, whereby they were systematically arranged into different categories according to different themes. The purpose of these categories was to emphasize particular word patterns that were considered pertinent to the research issue.

### 3.9.2 Analysis of Quantitative Data

The data analysis was carried out precisely in line with the research questions that were developed for the study. Analysis of quantitative data involved the application of statistical procedures. The responses to the questionnaire were methodically organized, categorized, quantified, and then analyzed statistically. Next, the data was compressed into frequencies and percentages, and then presented using frequency tables and graphical depictions.

## IV. FINDINGS & DISCUSSION

### 4.1 Questionnaire Return Rate

The research study sampled a total of 433 respondents. 386 students, 25 secondary school teachers, 2 National school Principals, 2 Special school principals and 18 principals from other categories of secondary schools. Table 3 illustrates the results.

**Table 3**

*Questionnaire Return Rate*

| Respondents | Expected | Returned | % |
|---|---|---|---|
| Principals of national schools | 2 | 2 | 100% |
| Principals of national special schools | 2 | 2 | 100% |
| Other Secondary school principals | 18 | 18 | 100% |
| Secondary school teachers | 25 | 25 | 100% |
| Secondary school students | 386 | 364 | 94% |
| **TOTAL** | **433** | **411** | **94.9%** |

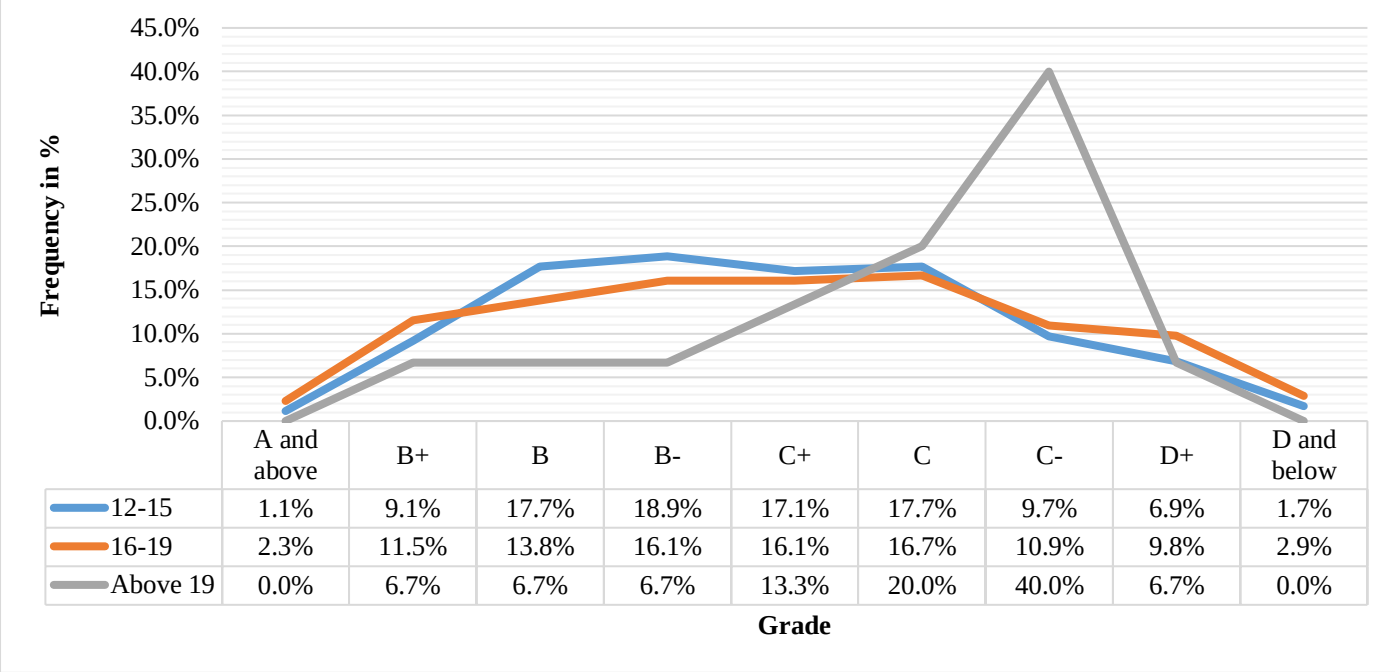
From Table 3, from the total of 443 participants who were specifically targeted for participation, a significant proportion of 411 respondents actively engaged in the survey, resulting in a response rate of 94.9%. The significant response rate can be attributed to the prompt administration and collection of questionnaires on the same day, facilitated by the assistance of research personnel. Saunders et al. (2007) posit that a response rate of 50% can be considered as satisfactory, while a response rate of 60% is deemed as favorable, and a response rate above 70% is regarded as highly commendable. Therefore, the response rate seen in this study was highly satisfactory.

### 4.2 Student's Academic Achievement

The study purposed to determine students' achievement in terms of Age, Gender, Class Stream and school type. The results are illustrated in preceding sections.

*Student achievement by age*

The study sought to determine students' achievement by age. The results are summarized in Figure 1.




| | A and above | B+ | B | B- | C+ | C | C- | D+ | D and below |
|---|---|---|---|---|---|---|---|---|---|
| 12-15 | 1.1% | 9.1% | 17.7% | 18.9% | 17.1% | 17.7% | 9.7% | 6.9% | 1.7% |
| 16-19 | 2.3% | 11.5% | 13.8% | 16.1% | 16.1% | 16.7% | 10.9% | 9.8% | 2.9% |
| Above 19 | 0.0% | 6.7% | 6.7% | 6.7% | 13.3% | 20.0% | 40.0% | 6.7% | 0.0% |

**Figure 1**
*Distribution of Students' Examination Achievement by Age*

Figure 1 displays the distribution of examination scores among students belonging to various age groups in Kakamega County, Kenya. The grading categories go from "A and above" to "D and below." Among students aged 12-15, just 1.1% attained grades of "A and above," suggesting that a minority of younger students excel. The majority of students, namely 17.7%-18.9%, are classified in the mid-range grades, including "B-", "C+", and "C". 9.7% of students achieved a "C-," 6.9% obtained a "D+," and 1.7% were classified as "D and below," indicating very poor performance.

Within the age range of 16-19, a somewhat greater proportion of students (2.3%) attained grades of "A and above" in comparison to the younger cohort. Achievement within the mid-range (B+, B, B-) is somewhat comparable to that of the younger age group, with around 13%-16% of students falling into these classifications. Within this group, the level of poor performance is particularly noticeable, as 9.8% of students achieved a "D+" mark and 2.9% received a grade "D and below."

Above the age of 19, none of the students attained a grade of "A and above," indicating a pattern where older students face more challenges in academic success. A considerable proportion (40%) of pupils are classified as "C-" grade, indicating a decrease in academic achievement within this age bracket. In this context, the mid-range grades are noticeably underrepresented, as just 6.7%-20% of students are classified in the "B-" to "C" range.

Research has consistently demonstrated that the school environment, encompassing resources, teacher-student interactions, and school culture, significantly influences student academic success. In Kakamega County, the disparity in academic achievement among different age groups may be ascribed to the quality of school infrastructure and allocation of resources. Those between the ages of 12 and 15 demonstrate comparatively superior academic achievement in the middle-range grades as compared to those beyond the age of 19. This observation implies that younger students may have greater access to superior school resources or exhibit higher levels of engagement with the curriculum. Conversely, older students may be attending schools with relatively limited resources or may be influenced by external circumstances such as the necessity for part-time employment or insufficient support from their families.

The student-to-teacher ratio may be lower in certain institutions in Kakamega County, particularly those that serve younger age groups. Mature students, especially those beyond the age of 19, may have inadequate academic assistance or direction, leading to inferior achievement (as indicated by the significant proportion of students attaining lower marks). Parental and community engagement, strong community support and active parental participation have been associated with improved academic results. Enhanced parental participation among adolescents aged 12-15 may account for their comparatively superior performance in middle grades, as opposed to older pupils who may exhibit greater independence yet encounter more distractions and obligations beyond the school environment.

Factors such as school culture, discipline, and the overall academic atmosphere can significantly influence the success or failure of learners. Schools that create an optimal learning environment, characterized by attentive study

practices and peer assistance, might facilitate children in attaining superior academic achievement, particularly during their early years. Among students aged 19 and older, the substantial decline in achievement (with 40% falling into the "C-" category) may suggest that they encounter more difficulties in adjusting to academic requirements or may have experienced disruptions in their schooling. This is confirmed by studies that shows that having access to adequate educational resources, such as laboratory facilities, well-trained teachers, and smaller class sizes, corresponds with improved academic achievements (Mulinge, 2017).

The findings of this study indicate that the school environment in Kakamega County has a substantial influence on pupils, whereby resources, teacher support, and community engagement are crucial factors contributing to academic achievement. The significant decrease in academic achievement among older kids may suggest underlying complexities in sustaining school involvement and delivering sufficient assistance for this particular age group.

### 4.3 Effect of Institutional Resources on Academic Achievement

The study sought to establish the effect of institutional resources on academic achievement in Kakamega County. The attainment of educational objectives and goals depends heavily on institutional resources. The respondents were asked to rate the statements on institutional resources on students' achievement. The Likert scale used was as follows: Don't know (DK) Strongly disagree (SD), Disagree (D), Agree (A), and strongly agree (SA). Descriptive statistics results are captured in Table 4.

**Table 4**

*Status of Institutional Resources on Academic Achievement*

| | SA | | A | | D | | SD | | DK | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Statement** | **F** | **%** | **F** | **%** | **F** | **%** | **F** | **%** | **F** | **%** | **M** | **SD** |
| The school has enough, spacious classrooms | 182 | 50.0 | 137 | 37.6 | 19 | 5.2 | 26 | 7.4 | 0 | 0 | 2 | 1 |
| There are enough science laboratories | 143 | 39.3 | 100 | 27.5 | 75 | 18.1 | 46 | 12.6 | 0 | 0 | 2 | 1 |
| School has Computer laboratory | 182 | 50.0 | 103 | 28.3 | 55 | 15.1 | 24 | 6.6 | 11 | 3 | 2 | 1 |
| Our school has a library for reading and for study | 216 | 59.3 | 81 | 22.3 | 48 | 13.2 | 16 | 4.4 | 3 | 0.8 | 2 | 1 |
| There is electricity for proper lighting and backup lighting in case of blackouts | 195 | 53.6 | 117 | 32.1 | 36 | 9.9 | 16 | 4.4 | 0 | 0 | 2 | 1 |
| Every student has his/her own desk | 221 | 60.7 | 127 | 34.9 | 11 | 3.0 | 5 | 1.4 | 0 | 0 | 2 | 1 |
| (For borders) Every student has his/her own bed- no sharing | 209 | 57.4 | 111 | 30.4 | 13 | 3.6 | 31 | 8.5 | 0 | 0 | 2 | 1 |
| School Kitchen and dining area are spacious and clean | 141 | 38.7 | 114 | 31.3 | 45 | 12.4 | 52 | 14.3 | 12 | 3.3 | 2 | 1 |
| The school has a reliable source of water | 183 | 50.4 | 98 | 27.0 | 17 | 4.7 | 48 | 13.2 | 17 | 4.7 | 2 | 1 |
| Our school has facilities and equipment for recreation and sports | 140 | 38.5 | 78 | 21.4 | 39 | 10.7 | 76 | 20.9 | 31 | 8.5 | 2 | 1 |
| Our school has duly assigned personnel in charge of securing its premises, its properties, and those of its students and teachers. | 100 | 27.4 | 82 | 22.5 | 31 | 8.5 | 124 | 34 | 0 | 0 | 2 | 1 |
| School has CCTV for security and surveillance | 99 | 27 | 86 | 23.6 | 47 | 12.9 | 103 | 28 | 29 | 8 | 2 | 1 |
| There are enough latrines available | 137 | 37.6 | 108 | 29.7 | 41 | 11.3 | 66 | 18.1 | 12 | 3.3 | 2 | 1 |
| There are enough bathrooms in the school for students | 171 | 47.0 | 89 | 24.5 | 31 | 8.5 | 39 | 10.7 | 34 | 9.3 | 2 | 1 |
| There are ramps and hand rails for Students with Disabilities | 100 | 42.0 | 51 | 14.0 | 94 | 25.8 | 83 | 22.8 | 36 | 0 | 2 | 1 |
| There are enough textbooks and exercise books for all students | 187 | 51.4 | 96 | 26.4 | 31 | 8.5 | 34 | 9.3 | 16 | 4.4 | 2 | 1 |
| There are enough teachers for all subjects | 221 | 60.7 | 97 | 26.6 | 17 | 4.7 | 16 | 4.4 | 13 | 3.6 | 2 | 1 |
| There are enough dormitories (for boarding schools) | 175 | 48.2 | 92 | 25.3 | 34 | 9.4 | 38 | 10.5 | 24 | 6.6 | 2 | 1 |

From the results in Table 4, 182 (50%) strongly agreed with the statement that the school has enough spacious classrooms, 137 (37.6%) agreed, 19 (5.2%) disagreed while 26 (7.4%) strongly disagreed. This indicates that most of the schools had enough spacious classrooms since a cumulative of 319 (88%) respondents agreed while 45 (12%) disagreed. This implies that most schools had conducive spaces for their students in classrooms. That teachers had easy time organizing their students in class in terms of sitting arrangement and even being able to reach every student

while teaching. Organized classroom promotes a sense of calmness and organization, allowing students to focus better and concentrate on their tasks. Akomolafe & Adesua (2015) concur that insufficient and unsuitable classroom conditions can provide challenges for teachers in delivering effective instruction and efficiently managing the class. Consequently, students have a tendency to forgo attending classes. Students may lack active listening skills, occasionally fail to accurately transcribe or revise their notes, and some may not successfully complete their academic assignments. All of these factors may inevitably lead to diminished academic performance of students.

On whether the school has enough laboratories, 143 (39.3%) strongly agreed, 100 (27.5%) agreed, 75 (18.1%) disagreed while 46 (12.6%) strongly disagreed. From these findings it is notable that 243 (67%) respondents were in agreement with the statement while 121 (33%) disagreed. The findings suggest that the majority of schools included in the survey possess laboratories for their academic disciplines. This aligns with utilization of laboratory facilities and the academic performance of students in scientific disciplines. The utilization of laboratory resources by educators was observed to enhance student outcomes, whereas the presence of large class sizes presented a significant challenge for principals in maintaining sufficient facilities.

However, some of Principals had contrary views when asked on the adequacy of classrooms, laboratories, dormitories and libraries spaces, one of the principals said this:

> *"There are never enough classrooms, laboratories, libraries and general infrastructure which is a result of the transitional 100 policy being implemented. The number of students enrolling in classes and lockers must always be raised due to this increase. Form Two students are living in those tents, which is why you can see them there. We are eagerly awaiting CDF's intervention, which we have already asked, in order to build additional* (Principal -X)."

According to Oduro (2009), controlling class sizes, coping with poor motivation, dealing with inadequate resources, and managing with fewer budgets are some of the issues principals face when providing laboratory facilities. Principals have significant challenges due to a lack of funding for laboratory equipment; as a result, they must collaborate with other stakeholders to find funding for laboratory equipment.

Regarding the presence of a computer laboratory at the school, 182 individuals (50%) highly agreed, 103 individuals (28.3%) agreed, 55 individuals (15.1%) disagreed, and 24 individuals (6.6%) severely disagreed. The majority of the responders, 285 (78%), agreed, while 79 (22%) disagreed. Most schools own computers for various purposes, primarily for curriculum-related activities.

Regarding the presence of a library for reading and study in the school, 216 individuals (59.3%) strongly agreed, 81 individuals (22.3%) agreed, 48 individuals (13.2%) had a neutral opinion, while 16 individuals (4.4%) strongly opposed. These statistics indicate that 297 (82%) of the respondents agreed with the statement, while 64 (18%) disagreed. The findings additionally demonstrated that 195 individuals (53.6%) expressed a strong agreement with the availability of electricity for enough illumination, as well as backup lighting in the event of power outages. 117 individuals, constituting 32.1% of the total, expressed agreement. On the other hand, 36 individuals, accounting for 9.9%, expressed disagreement, while a further 16 individuals, representing 4.4%, severely disagreed. The majority of the respondents, specifically 221 individuals (60.7%), expressed significant agreement on the presence of individual desks for every student. A total of 127 individuals, accounting for 34.9% of the respondents, agreed with the statement. On the other hand, 11 individuals, representing 3% of the respondents, disagreed, while 5 individuals, constituting 1.4% of the respondents, severely disagreed. This shows that a total of 348 individuals agreed with the statement, while 16 individuals disagreed.

Regarding the presence of designated staff responsible for ensuring the safety of the school grounds, its assets, and those of its students and teachers, 100 individuals (27.4%) highly agreed, 82 individuals (22.5%) agreed, 31 individuals (8.5%) disagreed, and 24 individuals (34%) severely disagreed. Inquiring about the presence of closed-circuit television (CCTV) at the school for the purpose of security and surveillance. Out of the total respondents, 99 individuals (27%) expressed strong agreement, 86 individuals (23%) expressed agreement, 47 individuals (12.9%) expressed disagreement, and 103 individuals (28%) strongly disagreed. It is worth mentioning that 29 individuals, accounting for 8% of the total, expressed uncertainty on whether the school premises were equipped with CCTV facilities.

Based on the results, 51.4% of the respondents strongly agreed that there were sufficient textbooks and exercise books for all students. Additionally, 26.4% agreed, 8.5% disagreed, and 9.3% strongly disagreed with this statement.

Regarding the claim that there were sufficient teachers for all subjects, 221 (60.7%) respondents highly agreed, 97 (26.6%) agreed, 17 (4.7%) disagreed, and 16 (4.4%) strongly disagreed. The principals have differing opinions regarding the extent of teacher adequacy. Teachers should possess the necessary skills and resources to effectively fulfil their responsibilities and make use of the available institutional resources. This guarantees the punctual fulfilment of the syllabus, thorough review, and enhanced student achievement. The present student-to-teacher ratio in public secondary schools is 29:1. According to the Basic Educational Booklet from the Ministry of

Education (RoK, 2019). The Principal concurred that the school suffers from an insufficient number of teachers, stating:

> *"When teachers are the primary implementers of the curriculum, it becomes extremely critical because how can effective teaching take place in such a situation? In addition, there are a lot of learners in classrooms because of the 100% policy on transition. I've asked the Teachers Service Commission for more teachers on multiple occasions, but to no avail. Sometimes we are compelled to hire former form four leavers who excelled but lacked teaching methodology. I employ BOM teachers, some of them are not qualified. I'm truly confused as a school manager because the parents always complain when their kids don't perform well.* (Source: teacher ii*)."*

Another teacher averred that;

> *"Timely access to educational resources, including textbooks, computers, and other learning tools, is essential for achieving academic excellence. Many schools suffer from a scarcity of learning materials, which might impede students' capacity to effectively complete tasks and properly comprehend the curriculum. Educational institutions that possess sufficient resources generally exhibit superior academic performance since students are equipped with the necessary tools to achieve success."* (Source: teacher iii)."

These opinions illustrate the lack of effectiveness of the teachers in these institutions, resulting in an increase in the student-teacher ratio and a decrease in the amount of time that teachers and students interact. Therefore, this factor would explain the underperformance of students in county secondary schools. The findings align with those of Ndlovu (2018) whose findings suggest that the resources possessed by educational institutions significantly influence student test scores, indicating that greater value and attention ought to be directed towards the activities within schools, alongside enhancing the quality of human resources at the school level.

### 4.4 Descriptive Analysis of Student Academic Achievement in Relation to Institutional Resources

The study sought to establish the status of academic achievement in relation to institutional resources. The respondents were asked to rate the statements on students' achievement. The Likert scale used was as follows: Don't know (DK) strongly disagree (SD), Disagree (D), Agree (A), and strongly agree (SA). Descriptive statistics results are captured in Table 5.

**Table 5**

*Status of Student Academic Achievement in Relation to Institutional Resources*

| | Strongly Agree | | Agree | | Disagree | | Strongly Disagree | | Don't Know | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | F | % | F | % | F | % | F | % | F | % | Total | M | SD |
| My academic performance has improved due to the availability of adequate learning resources. | 120 | 33.0 | 67 | 18.4 | 33 | 9.1 | 122 | 33.5 | 22 | 6.0 | 364 | 3 | 1 |
| I am satisfied with my overall academic achievements this academic year. | 113 | 31.0 | 76 | 20.9 | 33 | 9.1 | 127 | 34.9 | 15 | 4.1 | 364 | 3 | 1 |
| The availability of institutional resources (e.g., libraries, labs) has positively impacted my grades | 129 | 35.4 | 65 | 17.9 | 53 | 14.6 | 101 | 27.7 | 16 | 4.4 | 364 | 2 | 1 |
| I am able to complete my assignments effectively due to the resources provided by my institution. | 101 | 27.8 | 74 | 20.4 | 54 | 14.9 | 112 | 30.9 | 22 | 6.1 | 363 | 3 | 1 |
| My access to learning materials has contributed to better academic performance. | 136 | 37.5 | 70 | 19.3 | 26 | 7.2 | 86 | 23.7 | 45 | 12.4 | 363 | 3 | 1 |
| The quality of the physical facilities at my school (e.g., classrooms, study areas) has enhanced my learning experience and academic success. | 148 | 40.7 | 94 | 25.8 | 40 | 11.0 | 63 | 17.3 | 19 | 5.2 | 364 | 2 | 1 |
| I find it easier to concentrate and perform well academically because of the conducive learning environment provided by my school. | 128 | 35.2 | 99 | 27.2 | 46 | 12.6 | 77 | 21.2 | 14 | 3.8 | 364 | 2 | 1 |

The descriptive statistics presented elucidate students' perceptions regarding the impact of institutional resources on their academic performance in Kakamega County, Kenya. The analysis can be organized around the principal variables examined. 33.0% of respondents express strong agreement, while 18.4% concur that their academic performance has seen enhancement owing to the provision of sufficient learning resources. Nonetheless, a significant 33.5% express strong disagreement, highlighting a divergence in perspectives. The average score of 3 (on a scale of 1 to 5) coupled with a standard deviation of 1 indicates a moderate level of agreement, alongside considerable variability in the responses observed. A comparable trend is observed in this context, with 31.0% expressing strong agreement and 20.9% indicating agreement regarding their satisfaction with academic accomplishments. Nonetheless, 34.9% express strong disagreement, indicating a notable level of dissatisfaction among certain students. The average of 3 once more underscores diverse reactions, accompanied by a comparable standard deviation of 1, suggesting a moderate consensus yet considerable variability.

35.4% of students express strong agreement, while 17.9% concur that institutional resources, including libraries and laboratories, have had a beneficial effect on their academic performance. Nonetheless, 27.7% express strong disagreement, indicating a significant absence of influence for a segment of the student population. The mean is 2, indicating a lesser degree of consensus relative to other items, while the standard deviation of 1 reflects a broad spectrum of experiences. A notable 27.8% of students express strong agreement, while 20.4% concur that their ability to complete assignments effectively is facilitated by the resources at their disposal. Nonetheless, a significant 30.9% express strong disagreement, indicating considerable discontent among numerous students. A mean of 3 accompanied by a standard deviation of 1 suggests a divergence in perspectives. 37.5% of respondents strongly concur, while 19.3% express agreement, indicating that access to learning materials has positively influenced their academic performance; however, 23.7% strongly dissent. The average of 3, accompanied by a standard deviation of 1, indicates a level of moderate satisfaction while simultaneously underscoring the presence of varied perspectives.

A significant proportion of respondents, specifically 40.7%, express strong agreement concerning the enhancement of learning experiences through the quality of physical facilities, while an additional 25.8% indicate their agreement. A minority of students express strong disagreement (17.3%), and the mean of 2 accompanied by a standard deviation of 1 indicates predominantly favorable perceptions, despite the presence of some dissatisfaction among the student body. 35.2% express strong agreement, while 27.2% concur that a conducive learning environment enhances their concentration and academic performance. Nonetheless, 21.2% express strong disagreement. The average score of 2 suggests a generally favorable perception of the learning environment; however, it is important to note that a considerable number of students hold differing views.

The findings indicate that although a considerable number of students perceive institutional resources—such as libraries, laboratories, educational materials, and physical facilities—as beneficial to their academic success, a notable segment of the student population holds a contrary perspective. The disparity in responses indicates that the accessibility and caliber of these resources might vary significantly among institutions, or that particular student demographics encounter obstacles in their effective utilization. Enhancing the uniformity and availability of institutional resources may contribute to diminishing the percentage of students experiencing dissatisfaction, thereby fostering an improvement in overall academic performance.

### 4.5 Hypothesis Testing on Effect of Institutional Resources on Student Academic Achievement

To establish the effect of use of institutional resources on student academic achievement. Regression test was carried out to test $HO_1$ which states that there is no statistically significant effect of institutional resources on student academic achievement in Kakamega County, Kenya at 0.05 level of significance. The results are summarized in Table 6.

**Table 6**

*Regression Results of Institutional Resources on Academic Achievement*

| Coefficients[a] | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .638 | .213 | | 3.003 | .003 |
| | Institutional Resources on academic achievement | .693 | .102 | .336 | 6.789 | .000 |

a. Dependent Variable: Academic Achievement

The Table 6 displays results from a regression study investigating the effect of institutional resources on student academic achievement. Unstandardized Coefficient (B) = 0.638: This indicates that the predicted value of

student academic achievement is 0.638 when the independent variable (institutional resources) is 0. This denotes the fundamental level of academic achievement when no institutional resources are taken into account. t = 3.003: This represents the t-statistic for the constant term. The statistical significance of the constant is indicated by a t-value of 3.003. Statistical significance = 0.003: The p-value for the constant is 0.003, which is below the significance level of 0.05. Thus, the statistical significance of the constant indicates the presence of a substantial baseline level of academic achievement, even in the absence of institutional resources.

The unstandardized coefficient (B) is 0.693, indicating that for each unit increase in institutional resources, student academic achievement increases by 0.693. This indicates that institutional resources have a beneficial impact on academic performance. The standard error of 0.102 indicates the level of variability or uncertainty around the initial estimate of 0.693. A reduced standard error implies a higher level of precision in the estimate. The standardized coefficient, denoted as Beta, is equal to 0.336. This coefficient enables us to assess the impact of institutional resources in relation to other variables, if present in the model. A Beta coefficient of 0.336 indicates that institutional resources exert a moderately significant positive impact on academic performance. t = 6.789: This is the statistical inference statistic for the variable of institutional resources. A t-value of 6.789 above the threshold, suggesting a substantial impact of institutional resources on academic attainment. Statistical significance = 0.000: The p-value for institutional resources is 0.000, indicating statistical significance at the 0.05 level. These findings demonstrate that there is a statistically significant correlation between institutional resources and student academic achievement. By chance, the likelihood of these results occurring is exceedingly low.

The findings suggest Institutional resources exert a positive and statistically significant effect on student academic achievement. One unit increase in institutional resources is associated with a 0.693 unit improvement in academic achievement. The model posits that enhancing institutional resources can greatly enhance students' academic achievement within the examined setting. The low p-values (for both the constant and the variable) show that the results are strong.

The coefficient of .638 reflects the magnitude of this effect, suggesting that institutional resources contribute significantly to the variability in academic achievement scores among students. Consequently, the null hypothesis $HO_1$ positing no statistically significant effect of institutional resources on student academic achievement in Kakamega County, Kenya, is rejected.

This implies that institutional resources influence student academic attainment. When the school has up-to-date resources such as textbooks, classrooms, dorms, and electricity, students benefit from the positive communication of skills. The environment provides them with all they need to acquire the knowledge, resulting in academic achievement for the vast majority of students in secondary schools in Kakamega County, Kenya. Conversely, the reverse could be true.

### 4.6. Discussion

The investigation explored the influence of institutional resources (independent variable) on academic achievement (dependent variable). The unstandardized coefficient indicates the direct impact of institutional resources on academic achievement. This value suggests that with every unit increase in institutional resources, there is an anticipated rise in academic achievement. The influence of institutional resources on academic achievement is moderately positive. An increase in institutional resources results in a significant enhancement of student academic outcomes.

The findings indicate that institutional resources have a positive and significant impact on academic achievement. An increase in the availability or quality of institutional resources directly correlates with measurable improvements in student performance. The robust t-value and the extremely low significance level further confirm that this relationship is statistically significant and not attributable to random chance.

The findings suggest that institutional resources play a crucial role in influencing academic achievement. The statistically significant relationship indicates that enhancing institutional resources—like facilities, learning materials, and support services—has the potential to improve academic outcomes for students. The results highlight important considerations for decision-makers and educational organizations, underscoring the necessity of allocating resources to promote academic achievement.

## V. CONCLUSIONS & RECOMMENDATIONS

### 5.1 Conclusions

In the context of the production function theory, which posits that educational outcomes are a function of various inputs and resources, the study on student academic achievement in Kakamega County, Kenya, offers several key insights. According to this theory, educational inputs such as institutional resources directly contribute to

academic outputs. The study concludes that there is a significant positive relationship between institutional resources and student academic achievement in Kakamega County, Kenya. The null hypothesis H01, which states that there is no statistically significant effect of institutional resources on student academic achievement, is rejected based on the evidence provided by the regression analysis results. The findings highlight the critical role that institutional resources play in enhancing academic outcomes. A unit increase in institutional resources leads to a notable improvement in student achievement, demonstrating that investments in educational infrastructure, materials, and facilities can significantly boost academic achievement. Overall, this study underscores the necessity of providing adequate institutional resources to foster better educational outcomes and support student success in academic endeavors.

### 5.2 Recommendations

Kakamega County Education policymakers should prioritize strengthening school facilities, instructional resources, and teacher training programs to boost student achievement. Strategic resource allocation is critical to facilitating effective teaching and learning.

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