

Educational Learning Resources and Quality of Education in Kenya: A Case Study of Homa Bay County

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ABSTRACT

Teaching and learning resources are materials that are prepared, improvised, simulated, adapted to stimulate and enhance learning and training in specified learning areas. These resources are critical because they help to simplify abstract concepts, accommodate different learning approaches and directly boost learners' engagement in the learning processes. It is a requirement that all institutions of learning and training must make provision for them. Despite this provision, schools in Homa Bay County have continued to lack behind in provision of quality education. For instance for the years 2021 to 2024 the performance of students in Kenya Certificate of Secondary Education examinations was low. That is, for the last four years they registered average scores of 4.21, (2021), 4.19, (2022), 4.17, (2023), 4.09, (2024) Kenya Certificate of Secondary Education. The purpose of the study was to establishing influence teaching and learning resources on quality education in Homa Bay County. This study was guided by Yutchman and Seashore's (1967) System theory that posit educational resources are needed for the achievement of the desired objectives. The conceptual framework adopted was UNESCO quality framework. The study established that teaching learning resources accounted for 5.7% of the variation in quality of education. The teaching learning resources that significantly influenced the quality of education were recommended textbooks, teacher's guides, laboratory chemicals and materials, laboratory apparatus and equipment, charts, models, flash cards, posters and videos; and *realia*. The findings of this study are important as they form baseline for future research in related areas and policy formulation for guidance and practice.

Keywords: Educational Learning Resources, Quality Education, Kenya, Homa Bay County

INTRODUCTION

There are several foundational international human rights agreements that support quality education. For instance, in 1948 universal declaration on education as a human right was declared and countries of the world have given ascent to it. In Kenya, the Constitution 2010 proclaims education as a human right and the basic education 2013 advocates for quality education. This means that education must provide for children's development, physically, mentally and morally. In 1960 UNESCO (2005) advocates for quality of education that serves as a global commitment that ensures equitable quality education to all learners. All these conventions affirm the global need for quality education. Consequently, for years, transformation towards attainment of quality education has led to signing of various treaties and declarations globally. UNESCO, (2005) indicated significant to quality education globally was affirmed by the United Nations 1948 Universal Declaration on Education that declared education be a global right for human and then 1990 World education conference in Jomtien-Thailand as well as immediate 2000 Millennium Development Goals Conference in Senegal capital city of Dakar. Education 2030 Framework for Action proposed periodical global education meetings to aid in reviewing the progression of UN sustainable development agenda 4 that mandated quality education that is inclusive and provide lifelong learning opportunities for every individual globally (OECD, 2024). After successfully achieving access to education in many counties globally, the new global focus is now on improving school quality aspects such as students' achievements in national examinations. Countries that improved in global quality education ranking invested huge financial resources on educational resources to improve their quality of education. (OECD, 2022). Despite individuals' country attempts in improving education quality by

adjusting national budget and enacting new policies, differences in the level of education within countries still remain. UNESCO (2005) opines that the focus to access to education often overshadows the issue of quality education even in many of the countries struggling to provide all their children free as well as compulsory learning as stipulated by the 1948 universal declaration on education. This even include latest 2000 United Nations Millennium declaration that did not have any specific reference touching on quality of education.

The problem of inequality in education has therefore featured even in the most developed countries like United States of America. Irwin et al., (2024) indicated that despite heavy investment in secondary quality education, students' enrolment in undergraduate courses at post-secondary schools in US reduced by 13% in 2022 because of lower academic grades in the secondary level examinations. (NAEP) assessments 2022–2023 school year result indicated that mean scores point for students at age 13 in America reduced by 4 in reading as well as 9 in mathematics unlike in 2012, where the mean scores reduced by 7 and 14 points in reading and mathematics respectively. Students attending school are therefore expected to excel in their studies for the purposes of pursuing their preferred careers. However, most students continue to perform poorly, especially in Kenya Certificate of Secondary Education. The 2024 Kenya certificate of secondary school results indicated out of the 962512 students, only 246391(25%) were eligible for direct entry to university while a total of 712537 did not meet the university minimum requirement of C+ as 48000 students scored grade E. The number of quality grades such as Bs and as continued to depreciate as Ds and Es continue to rise (Kenya National Examination Council, 2024). This is despite the government-increasing capitation to 22,444, provision of school educational resources, initiating grid electric connection, establishing water points and introduction of 100% transition.

The report by OECD, (2023) found that French ministry of education effectively facilitated the implementation of Competency Based Curriculum by investing heavily in educational resources such as modern classroom and digital tools. In addition, teacher continuous professional development effectively equipped them to efficiently deliver the curriculum. OECD (2025) indicated that Netherlands implementations of Competency Based Education was anchored in the investment in digital infrastructure and teacher training. Ofsted, (2021) also indicated that England quality of education improved widely, but achievement gaps between disadvantaged students and their peers particularly in areas of the country that have economic challenges was still a serious concern. UNESCO (2022) showed that India significantly improved in increasing school's enrolment rates, but challenges such as lack of equitable access to quality education, especially in rural areas and for the marginalized groups persisted.

The Middle East a region of significant diversity in culture, history, and socioeconomic development as wells as rich heritage and economic potential faces profound educational disparities evident in various forms such as unequal access to educational resources, gender imbalances, and significant differences in educational outcomes across socioeconomic groups and geographic locations hindering progression towards the achievement of equitable and quality education for all. (UNESCO, 2020). In Africa OECD (2020) report indicated that access to high-quality education in South Africa's education system faces significant setbacks due to persistent poverty and socioeconomic inequalities. This therefore means South Africa quality education highly depends on professional development but most of the learning institution still lack qualified and well-trained teachers. This is also the sentiment from OECD, (2020) that indicated South Africa despite improving its access to education, the country continues to struggles with provision of education quality in public schools as teacher effectiveness and infrastructure often lack or inadequate. The report further indicated that education spending in South Africa was increased from 1.3% in 2017/18 financial year to 2.3% in 2021/22 to support fee-free education. World Bank (2023) report found that effective implementation of CBC in South Africa derailed by the outdated and insufficient educational resources in schools.

There are various materials that impact on quality education in Homa Bay County secondary learning institutions. This include Teaching and learning resources that include journals, workbooks, reference materials, timetables, schemes of work, record of work covered, register, lesson plan, commercial handouts, teachers guide, joint examination past papers, laboratory materials and laboratory apparatus. Digital resources such as, projectors, computer, tablets, television, smart boards, educational software and online resources. This is an indication that success in education not only depend on effective teaching and learning, but must also be supported by a various range of educational resources, each having a unique and critical part in the process of

education. Teaching and learning materials provide support the learning process as financial resources ensures that learning process is sustainable. A well-balanced interactions and integration of these significant educational resources promote effective learning for the success of the student in education.

Synthesis of Literature on Influence of Teaching and Learning Resources on Quality of Education

Doudu and Egyin, (2026) found that higher spending schools in America had the ability to buy and maintain high quality teaching and learning resources while schools that had low income had inadequate teaching and learning resources that hinder the learning process of the learner. This indicate lack of educational resources is even in most developed countries that spend most of the financial resources on education. This study recommends further research to establish resource distributions across county line, schools and demographic groups. This informed the current research. Kibirige and Lutalo (2025) in Uganda used 7 schools, that were well resourced to study the effect of teaching and learning materials on students' academic achievements and found that teaching and learning resources were inadequate in schools but those that were available were used by teachers effectively to support teaching and learning. Further the study found that student's performance was below the standard expected by education stakeholders. The study concluded that there was a positive significant relationship between students' academic achievement and adequacy of teaching and learning resources. The recommendations were that government to take initiatives of allocating adequate teaching and learning resources to schools for improvement of the learning outcomes.

Yolanda (2014) researched on factors that contribute student academic achievement in Tanzania secondary schools and found that schools good teaching and learning resources support the success of students' academic achievement and teachers who conducted evaluation before accepting students in their schools eventually produced better results in students' academic achievement. Further, the result of the study revealed ddescriptive research design of analysis was used in the studies and therefore could not give the actual influence of these aspects on quality of education. Study suggested further studies to be done to examine factors that influence high academic performance in the country and examining other variables that could be contributing factors to high academic performance.

Limbe (2017) carried out a study on factors affecting students' performance in certificate of secondary education examinations in Tanzania, and the study found that academic performance was low due to: shortage of teaching and learning materials and physical facilities, lack of readiness of students in learning and poor entry marks in form one and form three, low parental involvement and unclear policy. The study recommended duplicating the study in urban Tanzanian districts and other neighbouring countries like Kenya to compare rural and urban educational barriers. Rupia, (2022) found using learning materials effectively in the classroom not only assist both the teacher and the learners be consistent in educational content through effective communication but, also help in achieving educational objectives as the learning materials helps the teacher to communicate his idea to students. This means that using teaching and learning materials ineffectively reduce the chances of achieving learning objectives. This also means that poor management of learning materials undermines potential benefits of these vital resources, this therefore imply that having resource availability alone is not the only variable in the educational resources responsible for influencing the quality of education. There is need to understand the other variables such as resource adequacy.

Kinyanjui (2025) used Yutchman and Seashore (1967) system theory to determine influence of school teaching resources on students' academic achievement history in Nakuru County. Sampled respondents were 24 principals, and 48 departmental heads. The result found teaching and learning materials significantly influence the students' academic achievement. The recommendations of the study were that school principals to motivate teachers to use available materials to innovate teaching resources while government should provide schools with televisions, projectors and books to improve students' academic achievement. The gap filled by the current research. The study also suggested a repeat of the study in other Kenyan counties to see if rural, urban, or nomadic day schools face different challenges.

Agnetta, Kiende and Ogulu (2022) researched on the influence of teaching and learning resources on students' learning outcomes in Kenya. The study used 316 respondents and the result of the study indicated teaching and

learning resources had a moderate effect on students' learning outcome. This means that schools with enough teaching resources produced better results in examinations. Although the study found that teaching resources had impact on students learning outcome, it did not indicate the variations that different teaching resources account for in quality education indicators such as students' learning outcome.. The study recommended the need to increasing institutional resources through the Ministry of education. Mang'uu, Maithya and Kimani (2021) study found statistically insignificant association between students learning outcome and teaching and learning resources although it had moderate influence. This indicate that teaching resources are vital in delivery of the content that result in good grades in examinations. The study recommends adequate provision of teaching and learning resources in schools by education stakeholders as well as working together with both government and non-governmental stakeholders to ensure schools have adequate teaching and learning resources. These findings informed the current study to assess the teaching and learning resources in our schools and establish which teaching and learning resources have greater effect in students' learning outcomes.

Ngulutu, Mulwa, Mwanja and Mwanzia (2026) found that although teaching and learning resources available were effectively utilized by teachers, they were not adequate to affect performance in examinations. This implies that teaching and learning resources hinder learning of students. The study recommended that for improvement of academic performance, stakeholders such as school principals should ensure effective supervision to ensure effective use of school teaching resources. In addition, it was also recommended that schools to provide enough teaching and learning resource for improving the academic performance of secondary school students and realize sustainable education. This informed the need of the current research to asses if the schools have adequate resources and the influence of those resources on quality of education indicators such as student academic achievement.

THEORETICAL FRAMEWORK

This research adopted Yutchman and Seashore (1967) ssystem theory that stipulate that planning efficiently, acquiring, distributing and utilizing of scarce educational resources help to achieve the desired objectives. The theory further suggest that schools must use their resources effectively to generate optimal output and schools just like industries process their inputs (students) into specific out come (Performance). The theory application in schools imply that; as the students interact with school resources, these interactions result ultimately to a better result in Kenya Certificate of Secondary Education, an indication that schools with better educational resources such as physical resources, infrastructure resources, teaching and learning resources as well as human resources and use them effectively produce better results in Kenya Certificate of Secondary Education. This also imply that academic performance in Kenya Certificate of Secondary Education is an effective measure of quality education and is influenced by allocation of resources as adequacy of educational resources improves academic achievement and lack of educational resources suggest low achievement in educational resources used for implementing curriculum goals. Therefore, the theory supports the empirical evidence that adequacy of educational resources improves education quality. This theory supported the current study to research on these important resources a school acquires from its environment such as physical resources that forms input that go transformation process during curriculum implementation, instructional leadership, and resource allocation and then results into generated output such as student academic achievements which is an indicator of quality education.

CONCEPTUAL FRAMEWORK

The conceptual framework was adopted from UNESCO (2014) framework on quality of education that stated that there is association between the input and outcome as input in education translate into outcomes. The conceptual framework adopted to explain association that existed between dependent and independent variable in the study postulate that teaching and learning resources (text books, teacher guides, commercial handouts, joint examination past papers for revision, laboratory apparatus, materials and equipments) influence the dependent variable, quality of education. The intervening variables in the study were government policy and parental factors.

Conceptual Framework

INDEPENDENT VARIABLE

DEPENDENT VARIABLE

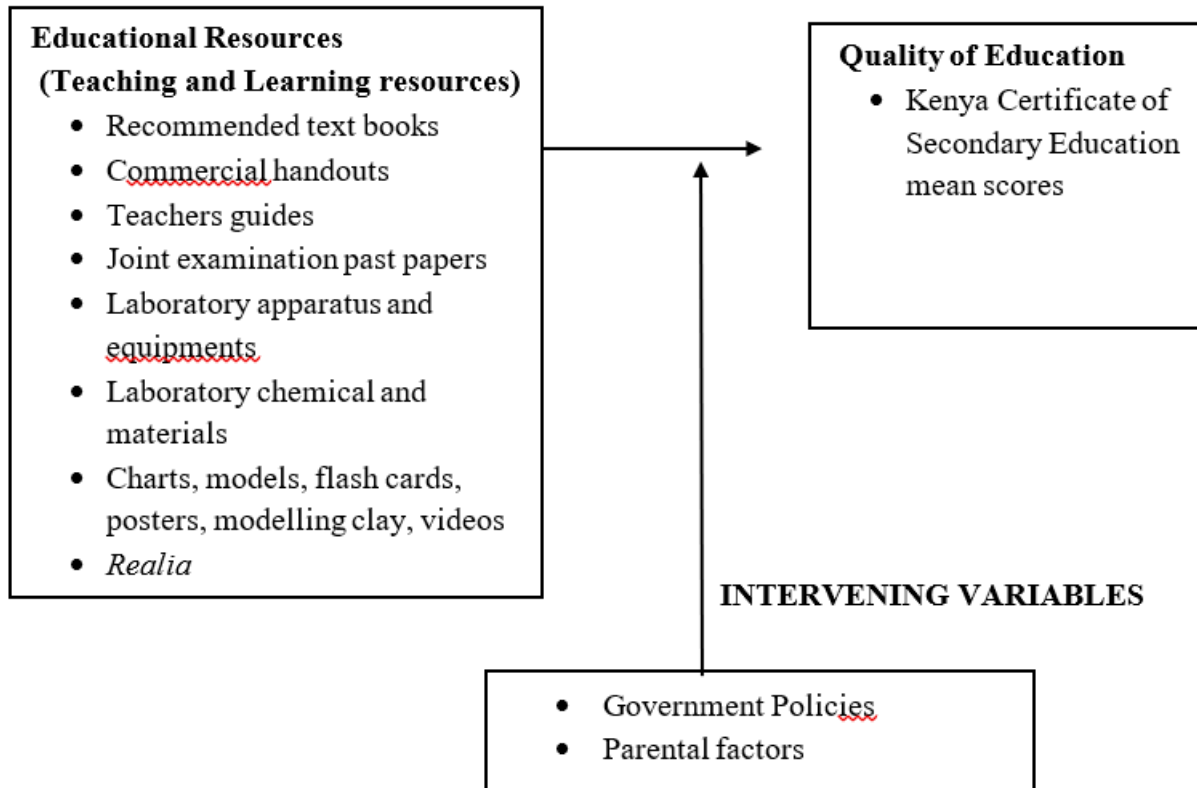


Figure 1 Conceptual Framework showing influence of Teaching and Learning resources on Quality of Education

RESEARCH METHODOLOGY

Descriptive survey as well as correlational research design were adopted for the study. The target population was 34000 form four students of 2025, 294 class teachers and 294 principals and 7 Sub County Quality Assurance and Standards Officers. The sample sizes of respondents were determined by use of Fisher's formula (Mugenda & Mugenda, 2003). When a target population is greater than 10,000, Fisher's formula (often credited to Andrew Fisher's Formula) is used directly without any population-based finite correction. The core formula is

$$n = \frac{Z^2 \cdot p(1 - p)}{d^2}$$

Where:

n: Desired sample size

Z: Z-score corresponding to the chosen confidence level (e.g., 1.96 for a 95% confidence level)

p: Estimated proportion of an attribute present in the population (if unknown, use 0.5)

d: Margin of error or degree of precision expressed as a decimal (e.g., 0.05 for 5%, or 0.1 for 10%)

and when the population is less than 10000, the formula is:

$$nf = \frac{n}{1 + n/N}$$

Where;

Nf= desired sample size

n= sample size (when population is less than 10000) = 384

N= target population

1= Constant

The sample sizes were 384 form four students of 2025, form four class teachers 167, 167 principals 7 Sub County Quality Assurance and Standards Officers. Simple random sampling was used to sample the 384 schools as a fast step in sampling. Second step in sampling was to select the respondents from the target population whereby simple random sampling was used to select 384 form IV students, 167 class teachers and 167 principals while saturated sampling was used to select 7 Sub County Quality Assurance and Standards Officers. Cronbach's alpha was used to determine reliability coefficient of questionnaires while face and content validity of the instruments was determined by experts in research whose input was included. Quantitative data was analysed by use of descriptive statistics inform of frequency counts, percentages, means and regression analysis. Qualitative data was transcribed and analysed for content in emergent themes and sub themes.

RESULTS

Demographic Characteristics of Respondents

The demographic characteristics of respondents were as shown in Table 1.

Table 1: Demographic Characteristics of Respondents

Gender of Class Teachers	Frequency	Percentage
• Male	90	59.7
• Female	61	40.3
• Totals	151	100
Professional Qualification		
• Diploma in education	33	21.9
• Bachelor of Education degree	98	64.9
• Master of Education degree	20	13.2
• Total	151	100
Category of Form four class teachers		
• Teachers Service Commission	138	91.4
• Boards of Management	13	8.6
• Total	151	100
Distribution of class teachers by School category		
• Mixed Day	52	34.4
• Mixed Boarding	7	4.6
• Boys Boarding	35	23.2
• Girls Boarding	26	17.2
• Boarding/Day Girls	15	10
• Boarding/Day Boys	5	3.3
• Mixed/Day/Boarding	11	7.3

• Total	151	100
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Table 1 indicate that there were more male class teachers 90 (59.7%) of the respondents than female class teachers, 61 (40.3%) of the respondents. These indicate that there was gender disparity in the number of female and male form four class teachers in learning institutions. Majority of form four class teachers had Bachelor's degree, 98 (64.9%). The popularity of bachelor degree may be due to the fact that those with bachelor degree outshine those with diploma during employment and therefore getting higher number during employment by the government. The other reason why bachelor degree was popular was because of the higher salaries attached to it and the academic respect given to degree holders. Only 20 (13.2%) class teachers had a master degree, this low number of class teachers with masters may mean that most teachers in Homa bay County secondary schools are not enrolling for post graduate studies, Therefore, this may be due to the time taken to pursue master's degree is longer and the employer only value certificates, diploma and bachelor degree and no increment for masters' certificates. This may be because the fee for master's degree may be high. There were 33(21.9%) class teachers who holds diploma; this may be due to competitions from those with bachelor degrees. This may also be because most of the universities stopped offering diploma in education courses. Thirteen (8.6%) of the class masters in Homa bay County were under Board of Management while a larger number of form masters, 138(91.4%) were employed by the Teachers Service Commission. The higher number of teachers employed under teacher's service commission may be due to the fact that the government has employed enough number of teachers in secondary schools to improve on quality of education. The largest proportion of respondents were from mixed day schools, which accounted for 52(34.4%) teachers. This is followed by boys' boarding schools with 35 (23.2%) respondents and girls' boarding schools, which comprised 26 (17.2%) respondents. Schools categorized as boarding/day girls had 15 (10%) respondents while those classified as mixed/day/boarding had 11 (7.3%). respondents A smaller proportion of respondents are drawn from mixed boarding schools, which represent 7 (4.6%) teachers and boarding/day boys' schools, which have the least representation at 5(3.3%) respondents. Overall, the results show that respondents are drawn from a variety of school types, with a higher concentration in mixed day and single-sex boarding schools. This distribution suggests a diverse school context, which may enhance the generalization of the study findings across different institutional settings.

School Data

School data for the schools involved in the study was as shown in Table 2.

Table 2 Students performance in Kenya Certificate of Secondary Education examination in Homa bay County, 2024 (n=151)

Mean Score	Frequency (f)	Percentage (%)
1.0 - 2.9	21	14
3.0 – 4.9	89	58
5.0 – 6.9	37	25
7.0 - 8.9	4	3
Total	151	100

From Table 2, it can be noted that majority-learning institutions scored a mean score ranging from between 3.0 to 4.9 as reflected by 19 (58%) while those scoring between 7.0 to 8.9 were only 4 (3%). The table also show that 14% scored very low marks ranging from 1.0–2.9, This indicate the schools continue to produce students who miss out in joining higher learning institutions that help to make them be productive. Only 4(3%) schools managed to achieve to attain higher performance mean scores of between 7.0–8.9, while no schools recorded highest performance category above 8.9. This is an indication that there is huge disparity in students' academic performance between the different schools since some continue to fail in examinations as other continue to pass their examinations. The general mean score for the Homa Bay County students' performance therefore lie between (3.0–6.9) in the 2024 Kenya Certificate of Secondary Education examination an indication that most

schools in Homa Bay County performed within the low to average. This performance is supported by Kenya National Examination Council (2025) report that showed 48,000 students scored grade E mean range below 3.0 and only 25% managed to get an average mean score for university admission in Kenya. These results also show that the schools continue to perform with individual disparities within schools as national schools with better educational resources to implement curriculum continue shine in academic outcome while smaller day Sub County school with severe shortage of educational resources schools that are poorly resources continue to fail in national examinations.

Research objective

The research objective was to establish influence teaching and learning resources on quality of education in Homa Bay County

In order to address this objective, data was collected from respondents on the status of teaching and learning resources and students' performance in KCSE from the respective schools for the year 2024. The collected data was subjected to descriptive and inferential statistical analysis. The results were as shown in Tables 3, 4 and 5.

Table 3 The Influence of Teaching and Learning Resources on Quality of Education (n = 150)

Aspects of Teaching and Learning resources		Ratings					Total	Mean Rating
		1	2	3	4	5		
Commercial handouts	F	0	0	60	81	9	150	3.66
	Score	0	0	180	324	45	549	
	%	0	0	40	54	6	100	
Recommended Text books	F	0	2	26	40	82	150	4.35
	Score	0	4	78	160	410	652	
	%	0	1.3	17.3	26.7	54.7	100	
Teachers guide	F	0	4	14	59	73	150	4.34
	Score	0	8	42	236	365	651	
	%	0	2.7	9.3	39.3	48.7	100	
Joint examination past papers	F	0	4	15	58	73	150	4.33
	Score	0	8	45	232	365	650	
	%	0	2.7	10	38.7	48.7	100	
Laboratory chemicals and materials	F	0	4	14	57	75	150	4.35
	Score	0	8	42	228	375	653	
	%	0	2.7	9.3	38	50	100	
Laboratory apparatus and equipments	F	0	4	15	60	71	150	4.32
	Score	0	8	45	240	355	648	
	%	0	2.7	10	40	47.3	100	
Charts, models, flashcards, posters, videos, modeling clay	F	0	4	14	59	73	150	4.34
	Score	0	8	42	236	365	651	
	%	0	2.7	9.3	39.3	48.7	100	
Realia	F	0	2	26	40	82	150	4.35
	Score	0	4	78	160	410	652	
	%	0	1.3	17.3	26.7	54.7	100	
Overall Mean Rating								4.23

Key: F – Frequency

%- Percentage

Interpretation of Mean Rating

1.00- 1.44 = No influence

1.45 – 2.44 = Low influence,

2.45 – 3.44 = Moderate influence

3.45 – 4.44 = High influence

4.45 – 5.00 = Very High influence

Table 3 indicates that all the aspects of teaching and learning resources highly influenced quality of education in terms of performance of students in Kenya Certificate of Secondary Education in public secondary schools in Homa Bay County. Although all the aspect of teaching and learning resources had high influence on quality of education, other aspects had higher level of influence than others. Among the variables of teaching and learning resources that had higher influence on quality of education were laboratory, chemicals, charts, *realia* and textbooks. Laboratory chemicals influence on quality of education was rated 4.35 by class teachers, meaning that they highly influenced quality of education. Thus chemicals when well used in carrying out experiments they enhanced the learners' mastery of content in the learning areas which led to better performance in the examinations.

Similarly, Textbooks were rated 4.35 denoting that they had high influence on quality of education. This can be attributed by the fact that textbooks provide the learners with information and exercise that improve their learning. They also ensure that lessons were more interactive and facilitate the understanding of concepts that are complex. Textbooks are also use as reference materials when learners are given assignments and projects. This enhances the learner's mastery in the learning areas that results in data performance in summative evaluation. Textbooks are also considered important teaching and learning resources that improves individual learning when the teacher is absent or when the students are at home. Therefore, textbooks has been of greater concern even to the government making schools to prioritize their acquisitions and use. The heads of institution should therefore continue with heavy financial investment in textbook provision programs to achieve adequate textbook-to-student ratios as well as replacing damaged books or lost books. The importance of textbook on quality of education therefore cannot be underestimated.

Another variable of teaching and learning resources that was rated highly at 4.33 was teacher's guide. The teaching guide is one of the essential professional documents that each teacher uses to achieve the desired curriculum standards. Teachers also use the guide in preparation of professional document such as lesson plan and schemes of work. This therefore indicated that teachers who valued the guide in lesson preparations improved students' academic achievement.

Joint examination past papers with a rating of 4.33 denotes a strong influence on quality of education. This implied that schools that used joint examination past papers produced better academic performance in KCSE than those that did not use the joint examination papers. The better result may be due to the fact that joint examination papers provide the learners with samples of questions that improve their knowledge and understandings. The result could also be due to consistent availability of the joint examination papers in school and the frequent use of this joint examination papers for revision.

Teaching and learning resources such as handouts had higher influence on the quality of education as was rated 3.66 an indication that schools value this core learning tools for revision and always avail them to students and teachers for revision after the completions of the syllabus. The schools therefore that had these types of teaching and learning resources availed performed better in examination than those without an indication that they were undergoing quality leaning. The handouts were however, comparatively lower than the core teaching and learning resources like text books and teachers guide an indication of low usage of handouts in schools or the schools prefer use of text books instead of handouts.

Charts and *realia* were rated as having high influence on the quality of education at 4.34 and 4.35 respectively. Charts and models do have high influence because they enhance the learners ability of imagination, creative thinking, critical thinking and innovativeness. These skills overallly help to improve the learners' cognition application and analysis of principles taught in different learning areas. They also make learning a reality. The consequences of which is improved performance in summative evaluation. Overallly, teaching and learning resources were found to have high influence on the quality of education in terms of performance of students in KCSE in public secondary schools in Homa Bay County with an overall Mean Rating of 4.23.

Regression analysis was computed in order to establish the actual influence of teaching and learning resources on quality of education. Data in Table 2 student's academic performance was regressed against data in Table 3 on teaching and learning resources. The results were as presented in Tables 4, 5, and 6.

Table 4 Regression analysis of the Influence of teaching and learning resources on quality of education

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.308 ^a	.095	.057	1.3340661	.095	2.489	6	142	.026

Dependent Variable: Quality of Education

Predictors: (Constant) Teaching and learning resources

From Table 4, it can be observed that teaching and learning resources accounted for 5.7% of the variations in the quality of education. The other 94.3% was due to other factors that were not subject to other studies. The null hypothesis was rejected because the p-value 0.026 was less than 0.05. This implies that teaching learning resources can be relied upon to explain the quality of education. These teaching and learning resources included handouts, textbooks, teachers guides, joint examination past papers, laboratory chemicals, laboratory apparatus and equipments, charts and models; and *realia*. These resources stimulates the learners mind and enhances the learners' ability to be interactive in the learning processes

To confirm whether teaching and learning resources were significant predictors of quality of education in terms of students' performance in KCSE ANOVA was computed and the results were as shown in Table 5.

Table 5 Analysis of Variance Output of the Influence Teaching and Learning Resources on Quality of Education

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	26.575	6	4.429	2.489	.026 ^b
	Residual	252.722	142	1.780		
	Total	279.297	148			

Dependent Variable: Quality of Education

Predictors: (Constant), Teaching and Learning Resources

From Table 5, teaching and learning resources was a significant predictor of quality of education, $F(6, 142) = 2.489$, $p > 0.05$ as the p-value of 0.026 was less than 0.05. This also means that teaching and learning resources could be relied upon in predicting the quality of education in terms of student performance in KCSE in public secondary schools.

To confirm the teaching and learning resources that significantly influenced the quality of education, multiple regression analysis was computed and the results were as shownn Table 6.

Table 6 Multiple Regression Aanalysis of the influence of Teaching and Learning Resources on the Quality of Education

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	6.289	.955		6.588	.000
X ₁ - Commercial Handouts	.068	.200	.029	.340	.734
X ₂ - Recommended Text Books	.346	.170	.205	2.038	.043
X ₃ - Teacher's guides	2.162	1.240	1.197	.1.743	.008
X ₄ - Joint examination past papers	.151	.868	.085	.175	.862
X ₅ - Laboratory chemicals and materials	1.344	1.052	.746	.1.277	.204
X ₆ - Laboratory apparatus and equipment	.882	.595	.491	1.483	.140
X ₇ - Charts and models	.262	.084	.152	2.623	.045
X ₈ - <i>Realia</i>	.411	.133	.304	4.359	.001

a. Dependent Variable: Quality of Education

b. Regression Equation $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \epsilon$

From Table 6, it can be observed that one unit increase in recommended textbooks enhances quality of education by 0.346 units as signified by the coefficient .346. For every one unit increase in Teacher's guide enhances quality of education by 2.162 as signified by the coefficient of 2.162. For every one-unit increase in charts and handouts enhances quality of education by 0.262 as signified by the coefficient of 0.262. For every one unit increase in *realia* enhances quality of education by 0.411 as signified by the coefficient of 0.411. Therefore from the regression equation $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \epsilon$. This indicate that out of the 8 teaching and learning resources, 4 significantly influenced quality of education These were; recommended text books, teachers guides, charts and models' and *realia* $Y = \beta_0 + \beta_2 X_2 + \beta_3 X_3 + \beta_7 X_7 + \beta_8 X_8$

DISCUSSION

Schools with laboratory chemicals, materials, apparatus and equipments conducted more practicals. This high frequency of practical activities make learners get used to the laboratory and students' many visit to the laboratory for the practical is necessary in supporting them to pass both internal and external examinations. Schools with laboratory chemicals and materials performed better than those that lacked these essential academic resources. This also imply that chemicals and materials allow the teacher to handle all the practicals as scheduled and therefore improve students' academic performance. This was supported by Oswago, (2021) who established the relationship between availability of teaching and learning resources and students' performance in KCSE physics in public secondary schools in Homa Bay County and found that availability of science laboratory and the adequacy of physics apparatus, chemicals as well as regular practical under the supervision of the teacher or technician improved students' academic performance. This also implied that education stakeholders should form policies that ensure that schools are provided by the needed laboratory chemicals just as if other educational resources provided Heads of institutions. There is also need to improve funding to schools for purchasing of the laboratory apparatus. School administrators should also ensure that essential laboratory chemicals are in place in time.

Mugambi (2006) found that, in order to do their part in meeting the crisis in education, educational resources need real resources that money can buy, a fuller share of the nation's manpower, not merely to carry on the present work of education, but to raise its quality, efficiency and productivity. This calls for the need to provide the most needed teaching and learning resources. Acute scarcity of instructional materials constrains educational system from responding more fully to quality education challenges and emerging issues in education. Likewise, Ngulutu, (2026) found that although teaching and learning resources had a positive impact on the student's academic performance in secondary schools, they were not adequate in Kitui County secondary schools. However, the few teaching and learning resources like textbooks, teachers guides and *realia* that were available were effectively utilized by teachers. The study recommended that for improvement of academic performance,

stakeholders such as school principals should ensure effective supervision to ensure effective use of the available teaching and learning materials in their institutions.

The students' focus group discussion also echoed the same sentiment that schools with textbooks, revision materials, commercial handouts, revision past papers and other essential teaching and learning materials performed better in Kenya Certificate of Secondary Education. This also concurred with the principal interview who argued that secondary school equipped with the facility like teaching and learning resource like text books, guides for teachers, revision past papers have the ability to perform well in the Kenya Certificate of Secondary Education because the teaching and learning materials provide the guidance needed. This means that teaching and learning resources are very important for the quality of education in terms of performance of students Kenya Certificate of Secondary Education in secondary schools. This implies that teaching and learning resources are very essential in enhancing the quality of education in terms of Kenya Certificate of Secondary Education performance and schools should ensure that they provide these essential resources for effective teaching and learning of students at the secondary school level.

Oswago (2021) indicated teaching and learning resources significantly influenced the performance of KCSE physics. The finding was also echoed by Quality Assurance and Standards Officer during the interview who argued that, secondary schools are many and sometimes share the facility like teaching and learning resources which include joint past examination papers, laboratory apparatus and equipment and *realia*. This makes schools with the enough teaching and learning resources to perform better than ill-equipped schools without teaching and learning resources. It is recommended that schools should have infrastructure committee to plan for provision of laboratories. This means that bright students are likely to perform well if the teaching and learning resources are put in place. This may also mean that the provision of teaching and learning resources and any other essential services provided to the schools by the government improve the quality of education to a certain level.

During the interview by the principal it was noted that commercial handouts, recommended textbooks, laboratory chemicals and materials and *realia* are very important in schools and schools cannot do without them although providing all of them becomes a challenge. Adequacy and availability of these teaching and learning resources also vary from one school to another as Sun County schools are poorly resourced than County, extra county as well as national schools. The same findings were supported by the student discussion group that indicated that some schools are well resourced with educational resources such as teaching aids, but continue to perform poorly in national examinations despite having the adequate resources provided the school as well as other education stakeholders such as world bank. These findings were also supported by Sub County Quality Assurance Standards Officer during the interview that the components of teaching and learning resources are multiple and the students' performance does not only depend on one particular component of teaching and learning resources but a combination of these resources because their influence combine force to determine the quality of education.

Recommended textbooks had statistically significant influence on quality of education. This because text book is used by the learners to learn new concept whenever the teacher is absent. The finding supports the Kenyan government policy that aim to ensure that secondary schools in Kenya have 1:1 textbook to student ratio. This may also mean textbook is one of the teaching and learning resources ranked highly in influencing the quality of education by the class teachers. This was also supported by Ngulutu, (2026) who found that although, teaching and learning resources had a positive impact on the student's academic performance in secondary schools, they were not adequate in Kitui County secondary schools. However, the few teaching and learning resources that were available were effectively utilized by teachers.

All other aspects of teaching and learning resources such as commercial hand outs, joint examination past papers, laboratory apparatus and chemicals do not have significant influence on quality of education in terms of students' academic performance in Kenya Certificate of Secondary Education, despite having different level of influence as indicated by their coefficients. The findings concurred with one principal during the interview that lack of teaching and learning resources like revision past papers, text books, handouts and teachers guide are some of the major challenges likely to influence the quality of education in terms of academic performance of the learners in both boarding and day secondary schools. Schools only prefer buying the essential teaching and learning

resources like text books leaving out some of the critical teaching and learning resources like teacher's guide. This implies that schools in Homa Bay County lacked some of the essential teaching and learning resources like teachers guide and text books hence did not perform better in KCSE. The result was supported by the interview with the Sub County Quality Assurance and Standards Officer who claimed; teaching and learning resources are significant factors influencing quality of education in terms of student performance at secondary school because they provide reinforcement to the teacher's lessons whether the teacher is present or absent. The teaching and learning resources are therefore a critical educational resource that should not be inadequate in schools.

The finding concurs with the result from students focus group discussion that reported that teaching and learning resources are being provided by the government and has some influence on quality of education in terms of student's performance in Kenya Certificate of Secondary Education in secondary schools. Rupia, (2022) also found learning materials in the classroom assist both the teacher and the learners be consistent in educational content and achieving educational objectives. Furthermore, learning materials aid in motivating students, developing creativity, evoking prior knowledge, encouraging the process of understanding, decoding, organizing, and synthesizing educational content, logical thinking, and reasoning, communicating and interaction, and contributing to the development of skills and the acquisition of values, as well as the retention of desirable values and attitudes. Teaching and learning resources had significant influence on quality of education in terms of students' academic performance in KCSE but the influence was significant and can be relied upon to predict quality of education in terms of student's performance in Kenya Certificate of Secondary Education in Homa Bay County County.

CONCLUSION

Teaching and learning resources had significant influence on quality of education in terms of students' academic performance in Kenya Certificate of Secondary Education. The teaching and learning resources accounted for 5.7% of the variations in quality of education. This means that an increase teaching and learning resources translate to improvement in the quality of education. The key teaching and learning resources in schools are recommended textbooks, teachers guide, chemicals materials and apparatus, charts and models; and *realia*.

RECOMMENDATIONS

1. Teachers should prioritize the most significant teaching and learning resources like text books, teachers guide and revision past paper.
2. Heads of institutions should ensure that library are adequately stocked with teaching and learning resources such as revision past papers, guides and books that are current and are recommended by the curriculum developers.
3. The Ministry of Education should improve on the book student ratio preferably 1:1.
4. Teachers and laboratory technicians should be retooled on the optimal use of laboratory chemicals and materials, apparatus and equipments for optimal utilization in enhancement of quality education.
5. Teachers should be encouraged to prepare and use charts and models in their day to day teaching.
6. *Realia* should be outsourced and availed in schools so as to enhance higher order skills.

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