

**INFLUENCE OF INSTITUTIONAL RESOURCE UTILIZATION ON  
STUDENTS' ACADEMIC PERFORMANCE IN PUBLIC SECONDARY  
SCHOOLS IN MAKUENI COUNTY, KENYA**

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**OCTOBER, 2023**

## DECLARATION

I confirm that this research thesis is my original work and has not been presented in any other university/institution for certification. This research thesis has been complemented by referenced works and dully acknowledged. Where text, data, graphics, pictures or tables borrowed from other works, including the internet, the sources are specifically accredited through referencing in accordance with anti-plagiarism regulations.

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## **DEDICATION**

To my beloved family members who are my husband, Peter Mutiso, my children Philip Sila & Caroline Nzilani, Mark Mulwa & Phides Karambu, Steve Mumo & Ayub Mutinda plus the special trio; Precious, Victor and Blessing, for their financial, material and spiritual support. May The Almighty Father grant them favour, grace and blessings.

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## ABBREVIATIONS AND ACRONYMS

<b>AECT</b>	Association for Educational Communications and Technology
<b>EFA</b>	Education for All
<b>FPE</b>	Free Primary Education
<b>FDSE</b>	Free Day Secondary Education
<b>GOK</b>	Government of Kenya
<b>ICT</b>	Information Communication and Technology
<b>KCPE</b>	Kenya Certificate of Primary Education
<b>KCSE</b>	Kenya Certificate of Secondary Education
<b>MOE</b>	Ministry of Education
<b>MOEST</b>	Ministry of Education Science and Technology
<b>PISA</b>	Programme for International Student Assessment
<b>SDGs</b>	Sustainable Development Goals
<b>SWAP</b>	Sector Wide Approaches Programme
<b>OECD</b>	Organization for Economic cooperation and development
<b>UPE</b>	Universal Primary Education
<b>UNESCO</b>	United Nations Educational Scientific and Cultural Organization
<b>UNICEF</b>	United Nations Children’s Fund

## ABSTRACT

School resource utilisation is important in the functioning of learning institutions as it enhances better achievement of school goals. There is evidence of poor performance in public secondary schools in Makueni County and hence the reason to have conceptualized this study. The purpose of this study was to examine institutional resource utilization and its influence on academic performance in secondary schools in Makueni County. The objectives of this study were to: establish the level of utilization of textbooks and its influence on students' academic performance; determine the level of utilization of school infrastructure and its influence on students' academic performance; establish the level of utilization of teacher resources and its influence on academic performance and lastly to determine the level of utilisation of instructional materials and its influence on academic performance in county secondary schools in Makueni County. The study adopted mixed methods research design, specifically convergent parallel research design and was supported by Education Production Function Theory. Research instruments were questionnaires, document analysis and interview schedule. Validity was achieved through expert judgment and reliability by test-retest technique. The target population was 60 county secondary schools, 60 principals and 1004 teachers. Simple random and stratified sampling techniques were used to select the schools while systematic and purposive sampling was used to sample teachers, HoDs and principals. The selected sample was 30 county schools, 30 principals and 286 teachers inclusive of HoDs. Total number of respondents was 316. Descriptive and inferential statistics (means, percentages and multiple regression) and thematic analysis worked out the level of utilization of textbooks, school infrastructure, teachers and instructional resources on students' academic performance. The findings showed that utilisation of textbooks had a mean of 4.06, high correlation coefficient of 0.664. Multiple regression showed that textbooks strongly influenced learners' academic performance. Utilisation of school infrastructure, teacher resources and instructional materials showed moderate means of 3.86, 3.68 and 3.71 respectively. The multiple regression revealed moderate influence existed between their utilisation and students' academic performance. Qualitative data revealed different themes meant that effective utilization of textbooks, utilisation of school infrastructure, teacher resources and instructional materials positively influenced students' academic performance in county secondary schools in Makueni County. Major conclusion was that there was needed to ensure effective utilisation of institutional resources in order to improve academic performance. Major recommendation included that the Ministry (MoE) to conduct seminars to teachers on utilisation of institutional resources. This study would provide important information useful to education policy makers in formulating additional policies leading to effective utilisation of resources in secondary schools.

## **CHAPTER ONE**

### **INTRODUCTION AND STUDY BACKGROUND**

#### **1.1 Introduction**

Chapter one begins by introducing the study on influence of institutional resource utilisation and students' academic performance in secondary schools in Makueni County. It also presents the study background, problem statement, the study purpose, the study objectives, research hypotheses, study significance, study limitations and delimitations, study assumptions, theoretical and conceptual framework, lastly, there is the operational definition of terms.

#### **1.2 Study Background**

Resource utilisation examines the effectiveness of the available resources within an institution and is expressed in a percentage (Kitowska, 2018). Resource-utilisation is very important in the functioning of schools because it ensures smooth running of operations and helps to reduce waste, it is key to ensuring projects' success, enhances better achievement of institutional goals and crucial in attaining quality students' school performance (Kapur, 2019). Resources-utilisation in educational institutions is justified by both economic and social returns reaped from investment in education (Woodhall, 2004).

Education is globally acknowledged as a vital investment in human capital as it contributes to a country's wealth and the wellbeing of its citizens. It makes the educated people make good decisions and is the cornerstone of both social and economic growth. According to Action Education (2022) investing a lot of money in educating the population is important in nurturing the next generations and is absolutely necessary in poverty reduction and helps to stop preventable ailments to a

great extent. Investing in education is essential in enhancing the survival rates of mothers and children for the minority groups and vulnerable populations living in slums and remote areas. Some researchers have shown that approximately 420 million human beings could be raised from poor living standards if all adult people finished education in secondary schools. Further, this lessens the total number of people living in poverty by three quarters in the whole world. Moreover, one more year of schooling improves the earnings of the male population by not less than 10% and that of the female population by at least 20% (Action Education, 2022).

There are myriads of challenges experienced in majority of the developing nations that inhibit effective achievement of the Sustainable Development Goals and especially goal 4 in education, some of which include low enrolments, lack of adequate institutional resources, poor standards of education as well as low learners' academic performance (Clark, 2013). To minimize the provision of low-quality education in Sub-Saharan African countries UNESCO (2014) advocates that these challenges should be addressed by increasing access to educational institutions, provision of adequate teaching and learning resources. The UNESCO (2015) in Sustainable Development Goal 4, urges countries to make sure that their people attain education of good quality and the opportunity for lifelong learning. Access to good quality education in children improves their welfare by making it possible to grow well, have successful lives and develop with positive attitude and capabilities. They gain authority to handle daily challenges and make informed decisions. According to the UNESCO (2015), the Sustainable Development Goal 4, in one of the targets, reveal that education is a basic human right to everyone and by 2030, all countries should ensure that every child complete free equitable and education of

high standard in basic education that contributes to improved academic outcomes. As they finish their basic education they attain good standards of ability and skills in linguistics and arithmetic. Therefore, there is increased demand for secondary education witnessed in many developing countries. For this reason, the issue of resource utilization in relation to academic performance becomes vital (UNESCO, 2011).

Globally, Education stakeholders and policy makers have overly continued to stress on how to improve both the quantity and quality of education provision. This new administration is comprehensively given consideration to Goal 6, of the Framework for Action embraced at the 'World Education Forum on Education for All (EFA)' which happened in Dakar, Senegal, in April 2000.

Upgrading all matters of education quality and guaranteeing excellent performance of all learners, enable attainment of relevant and effective learning achievement by all, particularly in English, math and basic life skills (UNESCO, 2000:43).

Thus, many education decision makers have continued to pay strong emphasis on the quality of the schooling achievement. The outcomes of educational achievement are connected to several school elements such as the surrounding school community or the actual learning in the classroom. Also required are the teachers, physical resources for teaching and the real instructional practices. The association between these four key areas in examining education quality of a learning institution, or the whole sector of education have therefore been outlined in the model grounded on System Theory (Scheerens, 2000).

Several scholars have operationally defined education quality in different ways such as stated by UNICEF (2000), detailed in Education for All (EFA) context, that

education quality would involve attributes like: healthy of the pupils, good-feeding and getting support from their families and the society. Moreover, secure learning environments, equity and equality in the education sector, sufficient education resources and qualified educators also matter greatly in improving education quality. Besides, facilitation of effective assessments and application of good education programs are fundamentals for acquisition of skills in reading, mathematics and basic skills in life. Further, information on prevention of diseases including HIV/AIDS, improved nutrition and fairness improve students' academic achievement.

Due to the numerous benefits accrued from education, many nations are still investing heavily in education. UNESCO (2014) indicated that nations allocate higher amounts of money to the education sector by giving at least 6% of the GNP and 20% of their whole budget in education. This particular mark had not been attained by the year 2012 as the world mean spending on education level was 5.1% and 15% of the country's budget and GNP respectively, this was recommended by the Education for All (EFA) World Monitoring Report.

The Global Monitoring Report (2014) showed that the cost of 250 million learners in the whole world failed to achieve the minimum proficiency in learning, interpreting this into a loss of an approximate calculation of \$129 billion. Overall, 37 states were at a loss of approximate half the amount used on elementary education as pupils were failing to learn. On contrary, information revealed that making sure there was inclusive, standard education for all learners, gave rise to very economically stable citizens and improved state's gross domestic product per capita by 23 % in 40 years.

In the wealthy nations, the systems of education were unable to meet the expectations of the minority groups. In New Zealand, majority of the learners from the rich and the well to do socio-economic backgrounds attained at least minimum proficiency in learning and mathematics in the 4<sup>th</sup> and 8<sup>th</sup> grades, and only two-thirds of the disadvantaged learners achieved the minimum standards. The migrants in developed nations also failed to achieve quality education: in France, given as an example, less than 60 % of the settlers had achieved the minimum proficiency in reading.

The same information disclosed that to attain education of high value for every student, nations should supply adequate qualified instructors, besides paying special attention of teacher strategies that led to achieving the needs and aspirations of the minority groups. This translated into selecting the most qualified applicants into the teaching profession; training them appropriately; moving them to the countries where they are highly required. Moreover, rewarding teachers to create positive attitude helped to prolong commitment in the profession. The same information also called for the necessity to deal with violence against gender in learning institutions, a key obstruction to provision of inclusive and quality education. This also paid special attention to the plans that enhanced effective assessment and inclusion of all learners in learning (UNESCO, 2014).

Numerous nations had incorrectly allocated huge amounts of money into public institutions of learning in believe that they would improve the learning outcomes of the learners, however, despite the huge monetary allocations per learner, they continued to pose a decline in academic performance. This differences between performance and spending had been caused by distracting administrative funds and

channeling it to other uses other than institutions core educational mission of providing quality teaching and learning.

Few legislators had put forward several suggestions that public education be made free, however, these programs only compromised quality of human capital with quantity of education (Nelson, 2015). Hanushek et al (2007) exhibited that disparity in the quality of education in countries had a slight difference of 20% to 35% of the nation-level GDP per student. These economists clearly showed that education or knowledge experiences possessed by population, is connected to mean years of being in school and the average grades.

The results of Hanushek et al (2007) resonated with June and O'Neill (2012), who indicated that differences in earnings of the citizens is closely linked to disparity on educational achievement which is reflected to a whole country. This particular research gave additional proof that educated people contribute to high innovation, increased production and eventual improvement of growth of the economy. Policies that enhanced the standards of education were highly supported and instead of allocating huge sums of money to schools which most of them used wrongly, governments minimized irregular payments in education and regulated it in order to nurture the useful talents in the society (Hanushek et al, 2007).

A report from the Global Education Monitoring Report (2021) affirmed that there were different resolutions on whether and how to allocate money from non-governmental organizations to various countries. In Canada, the government allocated 30% of government expenditure to self-sponsored institutions and 94% to public schools. In Netherlands, all school types irrespective of race, religion or colour received equal government's subsidy allocation to support the payment of

teachers, operation costs of the schools and extra funds given to learners from low-socioeconomic backgrounds. From the year 2000, some countries like Chile, United Kingdom, Hungary and Sweden had growing enrolment which received more than 50% while private institutions got 50% of the education funding from the government.

Around the globe, learning institutions in countries such as United States, Canada, Australia and Europe employed teachers at the beginning of school year. This was in readiness to improve the status of teacher levels caused by those who had exited the profession the previous year a result of low earnings and other related issues. Teacher quality and quantity is a major factor in enhancing quality learning outcomes. Among the Organisation for Economic and Cooperation Development (OECD) countries named herein, Norway and Belgium had very low student teacher levels, with an approximate mean of 10 learners per instructor in basic education (public primary and secondary schools). In Mexico, there was a striking difference of the student teacher ratios, which was termed to be the highest in the world and ranged from 25 to 30 learners per teacher, besides, this range affected the whole country. In the United States of America, there was an average range of 16 students per teacher in both primary and secondary education. High student teacher levels mostly led to negative effect on the students learning and discipline. Having high student teacher levels in a country meant that the government was unable to provide sufficient teaching and learning resources to the learners, further, the instructors had limited contact hours with their learners and therefore failed to achieve learners' aspirations and inclusion in learning situations. In order to improve wholly the academic excellence of students, governments needed to employ adequate teachers,

offer training programs that helped teachers update and increase their teaching methods, pedagogy styles, content knowledge and extra-curricular activities. Lastly teachers needed to be motivated by being paid high earnings and provision of French benefits. Many teachers believed that they could be influenced by factors that enhanced their commitment and guaranteed learners' academic success (Fleck, 2022).

Reports from UNESCO (2016) on teacher allocation and utilization in a study conducted in three African countries namely Chad, Côte d'Ivoire and Uganda indicated that in lower secondary schools in Chad, the length of actual teaching time was less due to the fact that the number of teachers was less and hence limiting the contact hours between the instructors and the learners. This inhibited sufficient meeting of learners' needs. In Côte d'Ivoire and Uganda, teachers taught for more hours and there was increased contact time between the teachers and the students, therefore achieving their educational needs. In simple terms, Côte d'Ivoire and Uganda had higher allocation of funding towards hiring sufficient teachers and purchasing additional institutional resources which contributed to improvement of education quality. The mean among the OECD countries was that there are 15 pupils for every instructor in primary learning institutions and 14 learners in lower secondary schools. The average school classroom had 21 pupils in Primary schools and 23 in lower secondary schools (OECD. 2021).

Nevertheless, these country-level mean tended to cover up the discrepancy and the failure to achieve maximum productivity at lower levels in the country. This circumstance was more difficult when examining the situation per subject. There

were few subjects which had adequate educators and hence failed to have the actual available instructional time, hence, there was deficient usage of the accessible teachers. A report from the Ministry of Education in Uganda (2012) showed that it was rather hard for a teachers in secondary schools to be given the responsibility of teaching a particular subject and due to some grounds or other, failed to teach for the actual length of contact time expected. Some of the reasons for these teachers not teaching effectively was rooted within the school organization and uncondusive classroom environments. Several studies conducted by heads of institutions disclosed that if all the number of untaught hours were added up at the national level, a high degree of loss could be detected. In some African countries like Togo and Burkina Faso, close to 28% of instructional hours could not be accounted for in the school years 2011 and 2014, independently. Generally, this state mean covered significant imbalances, a few areas having more shortcomings than others. All these facts led to under-utilization of teachers and diminished the effectiveness in the use of public institutional resources in education, this negatively affected the academic performance of students in those countries. It was vital to hire instructors in defined subjects and in specific science subjects (UNESCO, 2016). This study was an important element that motivated this current study to be conducted on utilization of school resources and how it would influence the learning achievement of learners in public secondary schools in Makueni County.

From one of the Kenyan news outlets, The Star (2020) on Reopening Schools in Nep-Daunting Task asserted that the ratio of learner-educator in the counties in the North Eastern Kenya is 70:1 as opposed to the approved 40:1 ratio in Kenya. This

indicated that the instructors were teaching large classes beyond 30 learners, which exceeded the ideal standard. The stipulated dearth of teachers covered the whole country, mostly in government schools which continually impacted negatively on the value of instruction and surprisingly worsening the quality of the students' academic performance. Congestion in classes was a threat to free face to face association by learners. Many students could become disorderly and unmanageable to the limited educators assigned. Eventually, a high number of students to instructor ratio made it hard for teachers to recognize learners with learning challenges and the consequences were, substandard scores and escalation of discrimination and labelling amidst all the students. Inadequate teachers in large classes contributed to excessive utilisation of the educators compromising this factor to low quality performance, an element that encouraged this researcher to establish the influence of utilisation of institutional resources on students' academic performance in Makueni County.

The Kenyan government had put in place several measures to respond to these constraints among them being, solving the issue of high learner-teacher ratios by hiring educators on non-pensionable terms and incorporating apprenticeship plans for instructors, besides recruitment of teachers by the Teachers Service Commission on permanent terms.

According to the GoK (2019) in the basic education statistical booklet, revealed that all classes in primary and secondary schools were 213,786 and 68,541 respectively. The mean number of pupils per class in primary schools was 40 and those in secondary schools were 45 students per class. From this information the Kenyan government appeared to be above the approved student to class ratio, when

compared to the OECD countries standard of a mean of 23 students in a class. Nevertheless, discrepancies seemed to prevail in the total number of students in a class in secondary level in Kenya. Other countries which had accessible information of classrooms with less than 20 learners, included the Russian Federation, Latvia, Finland, Poland, Lithuania and Estonia. Furthermore, there was also data of Japan and Costa Rica with over 30 learners in a classroom (OECD, 2021). This data showed that some developed countries too, had similar issues of congestion in classes in their learning institutions, leading to over-utilization of the number of teachers employed.

Among many Sub-Saharan Africa and Asia countries, it was approximately that above 84% of classes had more than 40 students per instructor, thus the learner teacher ratio was more than 40:1 in these growing states, which was a disturbing situation (UNESCO, 2006). Sub-Saharan Africa was leading with the highest learner teacher ratios in the following states: Ethiopia and Malawi with 70:1, Mozambique 67:1, Rwanda 65:1, Mali 55:1 and Congo with a student instructor ratio of 54:1 in that descending order. Afghanistan had the greatest pupil educator ratio of 83:1 amidst the South Asian countries followed by Bangladesh 50:1 and Cambodia 50:1. (UNESCO, Institute of Statistics, 2008). The elevated student teacher ratios in majority of the growing countries were caused by escalation of enrolments in pursuit to attain free universal basic education and the enlarging shortfall of teachers. This shortage of teachers and enlarging admissions of pupils contributed to the teachers coming across acute problems of managing congested classrooms, which were uncontrollable besides educators' inability to include all learners in the teaching and learning process. These great enrolments had led to underutilization and inefficiency

of institutional resources in our learning institution which was a major cause to learners performing dismally in majority of the public basic education institutions in the growing nations (UNESCO, 2006). In this regard, Kenya is not an exception in having over-crowding classrooms and inadequate qualified teachers especially this time when she is implementing the policy of one-hundred transition from primary to secondary schools. This had compromised high enrolments with provision of good quality education. The Government of Kenya (GoK) (2007) asserts that under-utilization and over-utilization of resources exist side by side with several learning institutions being with few registered learners and others with many registered learners. Researchers like PRLog (2012) have maintained that much research needs to be conducted on utilization of education resources and the quality of learners' academic outcomes in public secondary schools. As a result, this research was determined to ascertain if utilization of institutional resources had an influence to learners' academic performance in Makueni public county secondary schools.

According to Organisation for Economic and Cooperation and Development (OECD) (2021), provision of quality education in particular is a matter of supplying of suitable professional expertise, gender equality, providing the right school physical facilities and instructional resources and awarding of schooling grants.

A report on Education 2030 Framework for Action on the World Bank (2016) exhibited that giving large sums of money in education globally contributed to enhanced learning outcomes. A good example was, senior secondary schools in Nigeria had improved scores more than they had expected, and had defeated their colleagues in the state of Lagos, where majority of the learners had passed with B grade and higher in science and technology.

In Kenya, the table below generally shows there had been a declining number of candidates who had attained the minimum university entry grade, i.e., C+ and higher, as the last three years has had tremendous drop. In 2016, those who managed to score C+ and above were 15.41%, which dropped further to 11.38% in 2017, in the year 2018, candidates who achieved the minimum university entry grade formed 13.69%. The performance by both sexes was almost alike, for example in 2018, only 16% of the boys and 12% of the girls attained the C+ and higher to join universities. However, there was a slight improvement of 18.04% in 2019. Additionally, in the year 2019, many learners who had scored an E score dropped by 5.39%., which had more male students than female ones (Ministry of education, 2020).

This tendency of students achieving dismal performance as shown by many secondary students in Kenya needed to be addressed, taking into consideration the high amounts of funding has been allocated and utilised in the education sector. Therefore, it is from this proposition that this present research was put down to determine how institutional resources provided in schools could be utilised to influence students' academic performance in public secondary schools in Makueni County.

Data on student academic performance shows the trends in performance from 2015 to 2019. Student performance is used as an indicator to link collective efforts of teacher effectiveness and efficiency in using institutional resources.

**Table 1.1: Secondary school performance at KCSE National level, from 2015 to 2019**

Grade	Years				
	2019	2018	2017	2016	2015
A+	627	315	142	141	2685
A-	5796	3417	2714	4645	12069
B+	13366	8268	7344	10975	21927
B	24478	16403	12628	17216	33460
B-	35340	26156	27860	23745	44581
C+	46139	35818	19385	32207	54770
C	63102	49707	40474	44792	64913
C-	83358	71047	61040	61026	74115
D+	101687	96512	88447	80951	79157
D	137713	147918	135550	112135	79555
D-	152339	165139	179381	149929	48658
E	29318	30840	35536	33399	5350
<b>% Pass</b>	<b>18.04</b>	<b>13.69</b>	<b>11.38</b>	<b>15.41</b>	<b>31.52</b>

Source: Ministry of Education, 2020.

Table 1.1 above shows the performance of secondary school students in the Kenya Certificate of Secondary Education nationally from 2015 to 2019. The KCSE results clearly showed that in 2015, out of 525802 candidates who did the KCSE examination, only 169492 managed to score C+ above (7.00), which is the minimum university entry grade in Kenya. This is according to the Kenya Universities and Colleges Central Placement Service. This formed 31.52 percentage pass, which is termed as low performance, and a slight improvement of 0.74, from KCSE performance of 2014. In the year 2016, KCSE candidates dropped drastically and attained percentage pass of 15.41%. This performance worsened further to a percentage pass of 11.38% in 2017. In the following years 2018 and 2019, the performance in the KCSE performance improved very slightly to 13.69% and

18.04% respectively. This shows the performance in KCSE was low in 2015 to 2019 and could be concluded that 90.04% of the KCSE candidates in the mentioned years were unsuccessful in attaining the grade of C+ and above.

Table 1.1 above also summarizes the national level performance of secondary school students in KCSE from 2015 to 2019 which revealed that there was dismal performance. This was from the low percentage passes of those who managed to attain C+, the minimum university entry grade during the five-year period. This low national performance was disturbing to education stakeholders, the government and the parents especially during this time when the government is spending a lot of money in providing institutional resources and in the implementation of FDSE since 2008. It is therefore necessary to investigate whether these resources in public county secondary schools are utilised effectively and the influence on academic performance in Makueni County.

**Table 1.2: Academic performance in KCSE in Makueni County (2015-2019)**

<b>School category</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>Mean</b>
National secondary schools	8.745	8.992	7.293	7.885	8.459	<b>8.275</b>
Extra County secondary schools	7.843	7.738	6.586	7.543	7.982	<b>7.538</b>
County secondary schools	5.194	4.398	4.02	4.59	5.255	<b>4.691</b>
Day secondary schools	3.428	1.763	1.469	2.14	2.43	<b>2.246</b>

Source: Makueni County Education Office (2020).

Table 1.2 above shows performance of different categories of public secondary schools in Makueni County from 2015 to 2019, the main concern in this study was the county secondary schools. It is clear from the table that in 2015, the KCSE mean performance was 5.194, in the following year the KCSE mean performance in county secondary schools dropped drastically to 4.398, this performance continued

to go down to 4.02 in 2017. However, these schools began to improve in 2018 and 2019 to 4.59 and 5.255 respectively. The average KCSE mean performance for the five-year period was 4.691. In the same situation, a tremendous drop and slight improvement is also evidenced in the other categories of schools i.e., national secondary schools, extra-county schools and even day secondary schools. The KCSE mean performance from county secondary schools was bench marked with university entry grade which is mean of 7.00, (C+), therefore, 4.691 (D+), was considered low. The main cause of this low performance remains unrevealed and this warranted an investigation, thus this particular study was set to give attention to this issue. According to the GoK (2005), several researchers have shown that the school plant and the physical facilities are major element in improving both access and performance of learners in our learning institutions. These findings agree with Omariba, Ondigi and Ayot (2016), who found that even though educators recognised the full worth of the part played by teaching and learning using instructional technologies, they barely made use of the technologies available in their schools. Moreover, little researches have been done in public county secondary schools in Makueni County. Therefore, this proposed study is conceptualized to establish the influence of utilisation of institutional resources and how it influences academic performance.

### **1.3 Statement of the Problem**

The ideal situation in county secondary schools is that the government has provided resources in these schools which should be utilised effectively to give improved students' academic performance. However, the KCSE mean performance from the years 2015, 2016, 2017, 2018 and 2019 was 4.691, when this mean is bench-marked

with university minimum entry grade (C+ and a mean 7), it is below average. The cause of this dismal performance still remains unknown. The question is; are resources in county secondary schools optimally used? Since the inception of FDSE in 2008, the government has channeled a lot of money on training of teachers through several conferences and technical seminars such as SMASSE (GoK 2003), ICT: Digital Literacy Programme for Teachers (DLPT) (GoK 2016) and inclusive STEM in the 21st-century (GoK 2022). This was directly related to the achievement of the SDGs, particularly goal four on inclusive and equitable quality education, which promotes lifelong learning opportunities for all. Moreover, these conferences were geared at improving effective teaching strategies, innovative practices, effective use of ICT resources and instructional resources in a bid to enhance learner performance. Researchers have established that resource utilisation in educational institutions leads to both economic and social benefits as revealed by (Woodhall, 2004). A number of researches have been done on utilisation of resources in Kenyan schools, but little have been done in public county secondary schools in Makueni County. Therefore, this study was set to gather data to fill research gap. It is against this downward trend in KCSE average performance that the researcher was set to establish the influence of utilisation of institutional resources on academic performance of students in county public secondary schools Makueni County.

### **1.3.1 Purpose of the Study**

The purpose of this study was to determine the ideal state in connection to utilisation of institutional resources in public county secondary schools in Makueni County. The study was set to establish the ideal circumstance in terms of utilisation of school resources and how it influenced students' academic performance in the County. The

study findings would provide useful information to stakeholders in education on the extent to which effective utilization of school resources influenced students' academic performance.

### **1.3.2 Objectives of the study**

- i To establish the level of utilisation of textbooks and its influence on students' academic performance in county secondary schools in Makueni County.
- ii To establish the level of utilisation of school infrastructure and its influence on students' academic performance in county secondary schools in Makueni County.
- iii To determine the level of utilisation of teacher resources and its influence on students' academic performance in county secondary schools in Makueni County.
- iv To determine the level of utilisation of instructional materials and its influence on students' academic performance in county secondary schools in Makueni County.

### **1.3.3 Research Hypotheses**

H<sub>0</sub>1. Utilisation of textbooks has no significant influence on students' academic performance in county Secondary schools in Makueni County.

H<sub>0</sub>2. Utilisation of school infrastructure has no significant influence on students' academic performance in county secondary schools in Makueni County.

H<sub>0</sub>3. Utilisation of teacher resources has no significant influence on students' academic performance in County secondary schools in Makueni County.

H<sub>0</sub>4. Utilisation of instructional materials has no significant influence on students' academic Performance in county secondary schools in Makueni County.

#### **1.4 Significance of the Study**

This study would provide information useful to education policy makers on to how to formulate more policies leading to effective utilisation of resources in secondary schools.

The findings of this study would provide useful information to principals, teachers and learners on the need of making optimal utilization of school resources in pedagogy practices. The study results would be of vital use to the government policy makers at County levels and also National levels. This study findings would be significant to parents and other education stakeholders on the importance of improving students' academic performance in all public secondary schools all over the county. The findings of this study would generate data on utilization of institutional resources and their impact on students' academic performance which is useful to other researchers.

Lastly, the study findings would be important to officials in the Ministry of Education who may devise more methods of training teachers on enhancing resource utilisation in all secondary schools in Kenya.

#### **1.5 Study Limitations and Delimitations**

##### **1.5.1 Study Limitations**

The study encountered several restrictions, due to the fact that term dates had been shortened, teachers and principals had very little time left for syllabus coverage, filling of the questionnaires and administering of the interview took longer time than had been planned. The limitation was mitigated by increasing the time for data

collection and being more patient in order to collect well completed research instruments. Another limitation was some of the respondents were leaving some questions incompletely filled. This drawback was overcome by creating good rapport with the respondents and explaining to them vividly that this was purely academic research, they were briefed explicitly on how to fill all the questions besides anonymity and confidentiality was highly assured to all the respondents.

There was a big number of public county secondary schools in the Makueni County, which would make the researcher to spend a lot of time and funds for the study. This limitation was mitigated by sampling only 30 county secondary schools and getting a clear picture in connection to utilization of institutional resources. Lastly, some schools barred the researcher from entering into their schools due to third wave of CORONA disease which was still claiming the lives of many Kenyans. The researcher received the two jabs of covid-19 vaccine and obtained a certificate of the same in order to be allowed entry and collect data from county secondary schools in the Makueni County.

### **1.5.2 Study Delimitations**

This study focused on utilisation of school resources namely textbooks, school infrastructure, teacher resources and instructional materials and the influence on students' academic performance. Financial resources utilisation was not investigated. Utilization of institutional resources was believed to be affecting the performance of all secondary schools in Makueni County; however, the study was delimited only to public county secondary schools in Makueni County on the issue of school resource utilisation and academic performance. Study generalization would be on all public secondary institutions in Kenya. The study focused on

teachers including HoDs and principals who were the study respondents in public county secondary schools. Study generalization was done with caution to teachers plus HoDs and principals in county secondary schools in all the counties. Lastly, the researcher decided to omit public day secondary schools in the study as most of them were still coming up and most resources would not be adequate.

### **1.6 Study Assumptions**

The first assumption of this study was that all respondents gave information that would guide on utilisation of school resources and academic performance. This assumption was real as adequate data was collected in connection to the study. Another assumption was that few studies had been done on utilization of resources in public county secondary schools in Makueni County. Many other studies that had been conducted were on adequacy and availability of school resources, therefore there was a research gap to be explored. Therefore, this study assumption was genuine in terms to the research study.

Lastly, it was assumed that there was sufficient data on utilization of institutional resources in county secondary schools and that the results of the investigation would provide vital information on utilization of school resource and academic performance.

### **1.7 Theoretical Framework**

This study adopted Education production Function Theory whose proponent is Samuel Bowles of 1970. Education production Function Theory states that there is a connection between the inputs provided in institutions of learning, which through some process, are related to the measure of the school outputs produced i.e., students' academic achievement. School inputs which are considered in this

study include text books, school infrastructure, teachers and instructional materials. When these resources are exposed to certain processes and activities, the outputs produced are the function of the school environment, the suitability of the instructional materials, the quality of the teacher resources, the quality of the teaching services provided including their qualifications and teaching experience, variables which represent the ability of students, entry behavior, influence of out of school factors and the period learners have used the inputs. This explanation is shown in the following equation:

$$A = f(X_1 \dots X_m, \dots, X_n, \dots, X_v \dots X_w \dots X_z.)$$

Where A = some measure of quality school standardized scores (outcomes) (Hanushek, 2010).

$X_1 \dots \dots X_m$  = elements that ascertain the institutional environment e.g., the quantity and quality of instructional services, the institutional buildings, grounds, equipment and infrastructure, the period of time the learner is utilizing the school resource.

$X_m \dots \dots X_v$  = Factors that represent out of schools features that effect effective instruction, for example Socio-economic backgrounds and parental education level.

$X_w, \dots X_z$  = Variables that represent learner's capabilities, the earlier type of schooling before student enrolled here and the entry behaviour of the learner in the current school.

The main concern here is the relationship between the inputs and the estimated parameters of the function of (f), the outputs.

The theory outlines how students access institutions of learning with different characteristics and from various social economic status to learn, then through the activities and processes of teaching and learning they graduate with knowledge, skills and other important attributes. This knowledge enables them to survive satisfactorily in the society, making informed decisions, knowing their rights and engaging in both social, technological and economic growth. The government provides the resources, while the community provide the learners, so through the process of utilisation of these resources in schools students learn and attain many good qualities which enable them to comfortably join the world of work and live better lives.

Therefore, this theory is suitable for this study because an influence is expected to exist between the independent variable (institutional resource utilization) and (academic performance), if the institution's resources are used effectively. The theory anchors the study variables in that the utilisation of institutional resources, i.e., classrooms, laboratories, school libraries, teachers and textbooks bring positive change to grades the students attain and has advantages (Bowles, 1969). Oni (1995) confirmed that schools like other organizations use inputs through planned school programs and activities and the outputs produced depended on the extend to the utilization of the institutional resources.

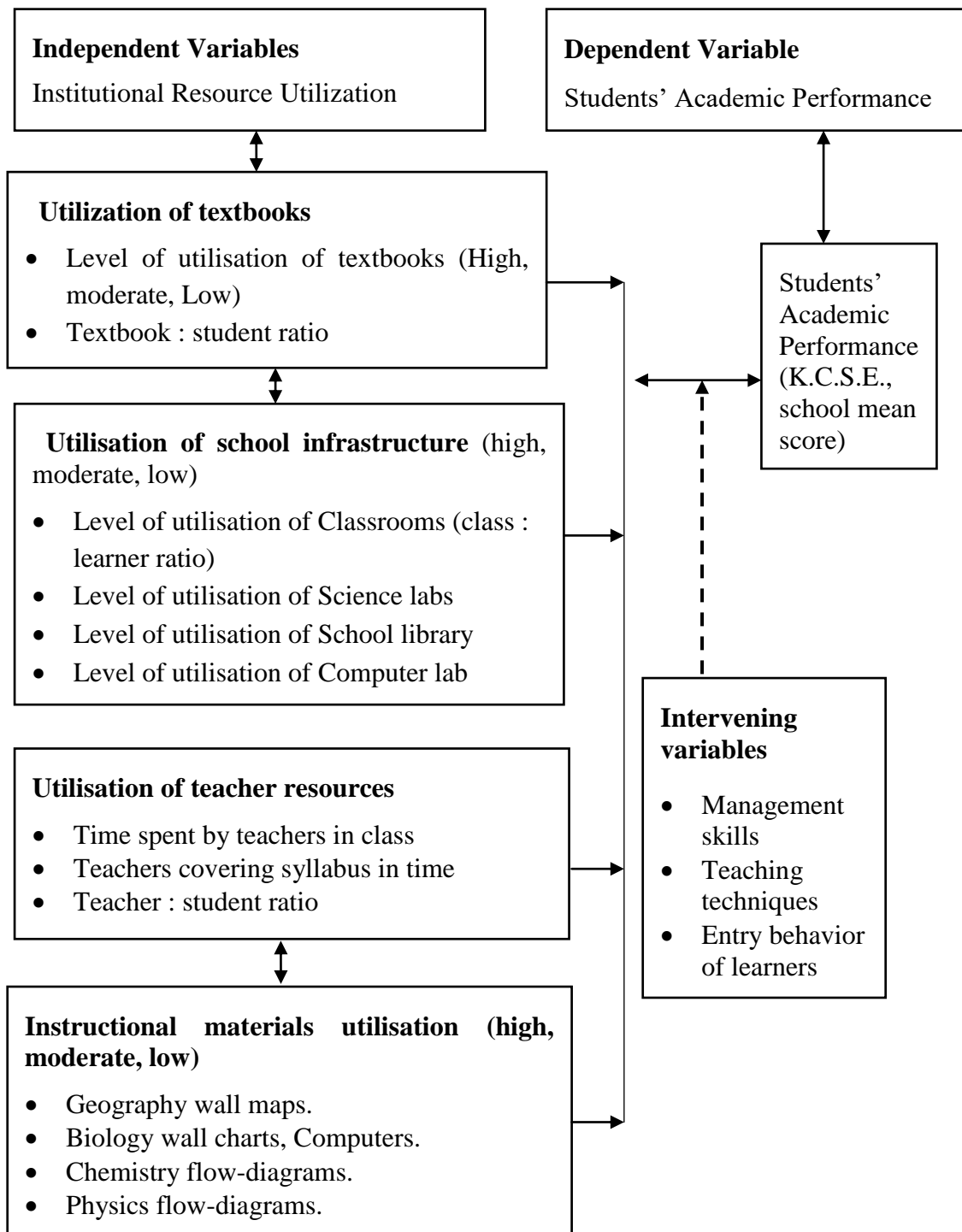
As depicted in education sector diagnoses (UNESCO: IIEP 2010), many stakeholders in the education system are paying particular concern to effectiveness in the instructional practices linked to quality of the educational outcomes. Moreover, there are several features that would describe what entails quality learning outcomes, such as; the institutional surrounding, both human and physical

resources provided, the actual process of teaching and learning as has been portrayed in the model build on Systems Theory, which is highly connected to education production function theory. The two theories are focused on the ways of using qualified instructors in classes and efficient administration of assessments to enhance effective learning and minimize discrepancies. Academic achievement of students includes acquisition of relevant knowledge, skills, quality scores and being active members in society.

There are some shortcomings with this theory as it is not automatic that optimal use of resources always leads to improved educational output (standardized scores), the process of teaching and learning in schools goes together with other challenges as it was revealed by Coleman (1966), that there are home factors (low socio-economic background) that affect the scores attained after using institutional resources in different countries.

The Education Production Function reveals that the number of minutes a teacher has been in class interacting with the learners and supervising them is a function of the amount of knowledge and concepts that have been internalized by those particular learners. This is linked to quality growth in student attainment. This theory is linked to using different school inputs that give rise to given set of school achievement (for example students finally acquiring educational success in examination results) (Harris, 2010). Thus, KCSE students' academic results improve after some length of time of effective utilisation of institutional resources.

## 1.8 Conceptual Framework



**Figure 1.1: Model of school resource utilisation and students' academic performance.**

**Source: Instruments**

Figure 1.1 above shows the conceptual framework that illustrates the interplay between independent variables (utilisation of institutional resources) and dependent variable (Students' academic performance). Utilisation of institutional resources is important in the functioning of institutions as it ensures smooth running of institutional operations, avoids wastage and improves productivity of the workers. It is crucial in ensuring improved learners' academic performance. Utilisation of textbooks is the action of reading them, doing assignments, using them during discussions and during revision time when nearing examination time. Utilisation of textbooks is important because it enhances students' reading culture and improves their grades in meantime. Utilisation of the school infrastructure is occupying and using the classes during teaching and learning sessions, science laboratories in doing experiments, school library in lending and borrowing books, using the internet and computer laboratory in instruction. Teacher resource utilisation entailed teachers teaching, administering examinations, marking and dealing with discipline cases. Instructional materials utilisation is the use of teaching and learning materials, e.g., charts, wall maps, flow-diagrams and laboratory materials to impart knowledge and skills to the learners. Intervening variables might be many but only a few are listed. However, for the purpose of this research they were not going to be discussed. Therefore, the extent to the utilisation of institutional resources determines school goal achievement and improvement of student academic performance.

## 1.9 Operational Definitions of Terms

**Academic performance:** This is the calculated grade achieved by a learner in every subject achieved by computing test scores.

**Institutional resources:** These are resources found in an institution which are used for instruction.

They include teachers, textbooks school infrastructure and material resources.

**Instructional materials:** These are animate and non-animate objects used by teachers in instruction. Instructional materials considered in this study include textbooks, maps, charts, science equipment and computers

**Instructional resource utilisation:** This is the practical use of teaching and learning materials for a certain time as compared with the total period of time it could be used expressed in percentage. Engaging learners in utilization of resources in teaching and learning.

**Resource utilisation:** This the length of time that a particular piece of school resource is used as compared to the actual length of time that resource was to be used. Practical and effective use of school resources to get the best benefit from them and avoid wastage and delays in operations.

**School infrastructure utilisation:** This is occupying the space within a room in schools for a certain length of time, using school buildings in the teaching and learning process for calculated time.

**Utilisation of teacher resources:** utilisation of teachers is the actual number of teaching minutes used by a teacher when compared to the actual period of time of use expressed in percentage. Effective discharge of teaching duties.

**Utilisation of textbooks:** This is the act of using textbooks to search information for instructors and learner for a specific length of time against the ideal length of time.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter shows the literature reviewed related to the study which was on utilisation of institutional resources and academic performance in public secondary schools in Makueni County. The review of literature was guided by study objectives as follows; level of utilisation of textbooks and its influence on academic performance, level of utilisation of school infrastructure and its influence on academic performance, level of utilisation of teacher resources and its influence on academic performance of students, level of utilisation of instructional materials and its influence on students' academic performance, the literature review summary and knowledge gaps.

#### **2.2 Utilisation of Textbooks and its Influence on Students' Academic Performance**

Textbooks are books that carry in depth collection of topics of a particular field of study with the aim of giving its clarity. Textbooks are made to satisfy teachers' demands, normally at institutions of learning (Oxford dictionary). These are the utmost remarkable features of an educational program and are frequently regarded as the leading autograph that moulds the processes of instruction (UNESCO, 2017).

According to UNESCO (2016) on the Global Education Monitoring Report, Policy Paper 23, reported that the measure of funds a nation uses on instructional inputs is a good symbol that it is committed to provision of a valuable education to all its citizens. Among the numerous instructional materials, this particular document's central attention is on textbooks, which are widely utilised in schools. Textbooks are

particularly linked to enhancing students' academic performance in developing countries, which have congested classrooms, large number of their educators not qualified and having limited teaching and learning hours. With committed and well-equipped instructors, alongside adequate textbooks which are designed with style are the most successful methods of increasing the quality of learning in our schools.

As shown by this document, every learner in various positions of learning, in majority of states either do not completely possess any book or they need to use it widely with other students. Limitation of textbooks contributes to school pupils wasting a lot of their time writing notes from the display boards, or strongly minimize their busy schedules of classroom studying. The high price of textbooks is major hurdle that bars learners from possessing instructional materials needed in schools.

The standard of teaching and learning resources are important in the attainment of the Sustainable Development Goal 4. This make sure that all schools have the right instructional resources and the application of ICT technology is a major plan for achieving specifically target 4a. In accordance with the Education 2030 Framework for Action, 'schools and the set goals to be achieved must be satisfactorily and fairly expedient, including; textbooks, open materials for learning, instructional resources and ICT technology resources that include to all learners. Also, important include suitable environment for learning, student friendly within a particular framework and affordable prices to each and every all student – young children, middle-aged old-aged (Education 2030, 2016).

Bieke, Kim and Jan, (2019) in their study investigated if textbooks influenced learner outcomes and the length of time in reading a passage in primary institutions

in Belgium. The information of the Progress in International Reading Literacy Study 2016 and a reassessment of this research in the year 2018 revealed that learners' educational advancement in reading comprehension led to gradual improvement in commitment in both grade four and grade six. The sample size was 3051 learners among 98 learning institutions. The learners' average in learning progress and commitment were correlated in five books using multilevel auto regression model and multilevel change score models. Several differences were noted in textbooks at average development in learning and assessment. For this variation to be minimal between student numbers and educated populations with varying textbooks, there was a control experiment for learners with different background levels, entry behaviour and language in grade four and level of the institution. The hypotheses were that textbooks had a positive relationship between engagement in reading and learning development. This depended on the writings and earlier (for the most part) investigation which narrated that school books to be taking a vital role in the educational programs instructed to learners every day. The findings of the two models revealed that school books failed to influence the learners' mean advancement in learning by reading comprehension and progress in engagement in grade four and grade six, in Flanders. Therefore there was rejection of the hypotheses (Bieke, Kim and Jan, 2019).

This study by Bieke, Kim and Jan, (2019) was on utilization of textbooks in the length of time in reading a comprehension and gradual improvement in commitment in both grade four and grade six encouraged the current study which was on utilization of several education resources and students' academic performance in Makueni County.

A study by Lepik (2015), which was done in Estonia revealed that majority of difficulties learners came across when doing exercises in class and home assignment were drawn from mathematics school books. In conclusion, mathematics textbooks could be asserted to be very vital and widely utilised material for instruction and learners' learning resources. This study by Lepik (2015) agreed with the one done by Tornroos (2005) which affirmed that high utilisation of textbooks enhanced students' academic performance.

Several studies were done to find out whether textbooks had any effect on students learning achievement. Tornroos (2005) reported that in the information from Finnish TIMSS 1999, use of textbooks positively influenced the performance of students in the mathematics subject. In particular, most of the educational possibilities in textbooks were directly correlated to students' academic performance. Therefore, in Israel's Arab community, Hadar (2017) did an investigation to determine whether textbooks in higher levels of understanding mathematics had opportunities that influenced students' learning achievement. They asserted that there existed direct correlation between these opportunities and learners' academic performance. In accordance to van den Ham and Heinze (2018), a study conducted in German using longitudinal survey method in grade 1 to 3, alleged that the choice of mathematics educators' guides significantly affected the academic performance of students in the mathematics subject. Additionally, when the writer of this mathematics teachers' guides moderated both instructors' and learners' environmental factors, this impact stayed on to end of the investigation.

Despite the fact that well organised and planned information was inadequate, and that which was available was for the key textbooks, available data asserted that in majority of the nations, learners at most of the levels were either in short supply of textbooks or needed to utilise them with their colleagues in their class.

Taken for instance, in Cameroon in 2012, only 1 textbook was shared by 12 learners and only 1 mathematics textbook was utilised by 14 pupils in the 2nd grade. The textbooks which were in highest shortage were for mathematics subject. In Togo, 8 pupils shared 1 textbook for mathematics in the 2<sup>nd</sup> grade, which was in contrast to 3 learners who utilised 1 textbook for other reading subjects. A study conducted in primary schools in 11 growing nations revealed that, on average, 15 to 20 percent of students in the 4<sup>th</sup> grade were in shortage of a single textbook or they used 1 with their peers. In several other nations, the proportion of textbooks was much greater: only 51 percent of learners in the Philippines and 31 percent of students in Paraguay had the ratio of mathematics books being 1:1 (UIS, 2008). The proportion of text books supply in the early grades was in very high amounts and instructional materials should be designed with style if high effect on learning was expected. An impressive range of textbooks and other instructional materials for learners at early grades were required for them to do practice and enjoy reading. In Chad, the language of teaching and learning in schools is French, yet when learners entered schools, very few pupils could speak it. According to a survey which was conducted by PASEC in 2010 asserted that only 20 percent of learners possessed a French textbook in the 2nd grade, in contrast to 40 percent of pupils in the 5th grade (Ministry of Primary and Civic Education and CONFEMEN, Chad, 2012). In Burkina Faso, 48 percent of the 5<sup>th</sup> graders utilised one mathematics textbooks in

contrast to 8 percent of their colleagues in the 2<sup>nd</sup> grade, in 2007 (Ministry of Basic Education and Literacy and CONFEMEN, Burkina Faso, 2009).

Secondary schools were in exception in having a high shortage of textbooks. The SERCE (2008) findings showed that in Paraguay, a quarter of learners in grade 6, possessed their own textbook of mathematics. Half of the pupils were noted to be sharing books with their peers. 43 percent of the learners possessed their own textbooks of mathematics in the Dominican Republic, and 37 percent used a book with their colleagues (LLECE, 2008). In a study done in 19 sub-Saharan African nations, Botswana had supplied sufficient textbooks to all secondary schools and to all grades to almost 1:1 ratio for all subjects.

In other 18 states, inclusive of Mozambique, Zambia and Lesotho, textbooks in secondary schools, specifically in subjects which were not key, had very high shortage (World Bank, 2008). In Rwanda, in the year 2014, almost all subjects at the primary schools had achieved the world level of 1:1 ratio of textbooks, however, much needed to be done at the secondary schools. The ratio was 3 learners per 1 history textbook in lower secondary schools and 5 students per 1 literature textbook in upper secondary schools, this affected the student performance in the subject. (Ministry of Education, Rwanda, 2015). The study carried out in Rwanda revealed that high provision and utilisation of textbooks disagreed with another study conducted in Liberia which showed low provision and utilisation of textbooks. Nations which have low provision of textbooks affected their utilisation and led to a negative effect in learner academic outcomes. This findings from Rwanda and Liberia on student book ratios and utilization and the effect on learners' academic achievement encouraged this current study to be investigated in Makueni County.

Although there is normally high shortage of school book accessibility, there are great disparities in different areas. In 2013, in Liberia, the number of learners sharing one textbook is seven, and specifically in Margibi County, and more than twice the mean at national level (Ministry of Education, Liberia, 2013). In South Sudan, the number of students using 1 book is 2 and in Central Equatoria State, the ratio of pupil to textbook is 11:1 in the of State Unity (Ministry of General Education and Instruction, South Sudan, 2012). It was revealed that in Kenya, GoK (2019) The Kenya Basic Education Statistical Booklet that, text book ratio in the core subjects (English, Kiswahili, Mathematics and sciences i.e., Chemistry, Biology and Physics) was 1:1, meaning that students in public secondary schools rarely shared textbooks in the core subjects. Makueni County was no exception. However, there was sharing of the textbooks in the other subjects which were not key, which had a higher ratio. Further, teachers extensively utilised textbooks when referring in order to cushion their subject content knowledge. Utilisation of text books in the teaching and learning is vital in influencing the quality of learners' academic performance and a reason as to why this study was considered and conducted in Makueni County.

According to the Department of Basic Education, on the case of textbooks in Limpopo, declaration was that instructors perform the work of books. However present studies advocated differently that in majority of the instances, educators had inadequate content knowledge in many of subjects they taught. Information from the pan-African research exhibited that just 32% of teachers in South Africa possessed adequate and the required content knowledge. Therefore, textbooks were fundamentally vital in directing the teachers in instruction of educational programs

in specific subject matter. In the context of limited content knowledge by teachers, school books were highly utilised and acted as a major role in strengthening educators' content knowledge shortfalls (Veriava, 2015).

Accordingly, Veriava (2015), Spaul, who investigated the effect of availability of textbooks on educational achievement revealed that pupils who had their own books for reading, or who utilised the textbooks with only one student, achieved improved students' academic performance than those who utilised them with higher than two peers. South Africa had many issues affecting the education sector. However, there was substantial evidence that availability and utilisation of schoolbooks was a strong foundation in enhancing learning outcomes. Textbooks are key in conquering some of the advanced constructional shortfalls in instruction in all learning institutions.

Among the following countries; Namibia, Malawi and Kenya, from the years 2000 and 2007 underwent expeditious growth in admissions, though the accessibility of school books remained the same. The percentage of learners in Malawi, who either lacked a single textbook or had to utilise with more than two other students grew from 28 percent in 2000 to 63 percent in 2007. A great difference was seen in Swaziland, where the percent of learners using their own textbooks grew to 99 percent from 74 percent, besides student admissions in the 6<sup>th</sup> grade growing in numbers to approximately 20 percent. On the same note, it should also be well known that the accessibility of school books did not automatically indicate utilization in classes. Textbooks could perhaps be kept in stores in fear of loss or damage by the learners. It was proclaimed that in Malawi, educators were unwilling to provide to learners school books as they were worried that they could perhaps fail to care for them or they fail to come to school and therefore fail utilise them (World

Bank, 2010). There was unpredictability over future disbursement of textbooks in Sierra Leone that contributed to keeping the school books in store and failing to utilize them (Sabarwal *et al.*, 2013). This information on utilisation of textbooks has encouraged the current study that was established to determine utilisation of school resources in public secondary schools and their influence on quality learning outcomes in Makeni County.

A good number of researches who have substantiated the important part played by textbooks in enhancing learners' academic performance to have been guided by policies in education. All learners in primary schools in Swaziland had been supplied with free textbooks since 2003 (SACMEQ, 2011). Further, nations like Nicaragua and Guatemala also established programmes on provision of schoolbooks without charges focusing mostly on the underprivileged (Porta and Laguna, 2007).

A programme on impact evaluation in aiding basic education in Ghana revealed that improvement in English and mathematics grades amid 1988 and 2003 was slightly connected to escalation of textbooks accessibility (White, 2004). When learners, particularly the girls in South Africa did not share textbooks, they highly improved on reading tests (Zuze and Reddy, 2014).

A cross-country examination grounded on information from assessments in regions in 22 sub-Saharan African countries affirmed that teaching and learning resources, textbooks in particular for the key subjects of arithmetic and English, greatly enhanced instruction; supplying adequate textbooks in the ratio 1:1 to all learners in a class improved reading grades to between 5–20 percent (Fehrler *et al.*, 2009). In Cameroon, Burkina Faso, Madagascar, Senegal and Côte d'Ivoire, when a few learners could read textbooks in the class, skills in reading of their classmates who

lacked textbooks greatly grew because of increased sharing of content knowledge and motivation (Frolich and Michaelowa, 2011). World Bank research had confirmed that negative effect on learning was insignificant when shifting from two learners using one book to three students sharing one textbook (Fredriksen *et al.*, 2015). The study conducted in South Africa by Veriava, (2015) agrees with this study which revealed that a negative effect in learning achievement was experienced when textbooks sharing among learners is high. Textbook utilisation became more effective when a learner used his or her own textbook as this learner got adequate time to digest all the necessary information with ease. However, research by Fredriksen *et al.*, (2015) was not in agreement with the current study as it showed that there were other factors like content knowledge and motivation that influenced academic achievement despite having students sharing textbooks in the ratio of 1:1.

According to GoK (2019) in Kenya Basic Educational Statistical Booklet, provision of high standards of education in Kenya is highly influenced by low learner textbook ratios. The textbooks supply in Kenya was managed in two ways which were; procurement from the central government, dispersal by the MoE and through uniform per capita payment by the government at institutional level. In acquisition from the central government, the centre of interest was on mathematics and reading textbooks as they provided the basic skills in learning. The Learner textbook sharing in primary learning institutions at 1st, 2nd and 3rd Grades was almost at 1:1 for the core subjects, literacy and mathematics subjects (Kiswahili, English and Mathematics). In Classes 7 and 8, each learner made use of his or her own book in primary schools, Utilisation of textbooks to pupils above the ratio of 1:1 was

because predictions were made with the number of learners in the preceding classrooms.

In the level of public secondary institutions, the key subjects that were taught included Sciences, Mathematics and Languages. Textbooks for the key subjects were dispersed for students in public secondary schools, whereby each utilised his or her own textbook. Any of the learner textbook sharing which was above the ratio of 1:1, was caused by difference in the number of students in the foregoing classrooms. However, other subjects which were not core had the ratio of student textbook sharing being higher than 1:1 in most of the public secondary schools in Kenya leading to underutilization. When given home assignments to be done, learners could carry textbooks home and did it with ease, which improved the quality of the test scores. This encouraged the researcher to investigate utilisation of institutional resources and students' academic performance in Makueni County.

Wanjiku (2013) did a study on accessibility and use of institutional resources using descriptive survey and alleged that, although there were distinctions in the types of schools, there existed correspondence on the way learners used textbooks. Textbooks are used by learners in various methods such as; in group discussions, making notes, reading personally when doing individualized study and in classroom reading. According to this research, textbooks play a significant part in improving the standards of schooling. Further, there was insufficiency of text books in these schools although the scarcity was not as high as the number of student book sharing was in most of the different classes in learning institutions. This hampered effective utilization and impacted negatively on effective teaching and learning. Majority of the researchers who had studied on educational resources and students' academic

achievement had confirmed that school books mostly furnished learners with very vital content knowledge as defined by the educational programs. Additionally, students could not learn without textbooks as they gave essential information. Other studies that had agreed with this research are; Psacharopolous (2006), who contended that optimal utilization of school books led to effective learners and educators' instructional practices and highly increased students' academic achievement in assessments. Similarly, Chepchieng (2005) alleged that sufficient and standard textbooks in learning institutions greatly improved learners' academic performance of poverty-stricken households.

Bearing in mind that distinct areas across the globe have diverse features and dissimilar systems of education and various elements influence education differently in different zones. However, different education results are achieved in different learning levels. Several publications have been surveyed mostly on utilisation of textbooks and the influence on academic performance of students which have been conducted by use of various research plans and procedures. The findings showed that high contrasts existed from one area to another around the Globe. Although great differences have been reported, there was correlation between textbook utilisation and students' academic performance on majority of the above surveyed literature. Therefore, the above literature was reviewed to determine the degree to which utilization of textbooks influenced students' academic performance in public county secondary schools in Makueni County.

### **2.3 Utilisation of school infrastructure and its influence on students' academic performance**

This literature reviewed on objective two was on utilisation of school infrastructure which was done as follows: classrooms, science laboratories, the computer laboratories and the school library. According to Kapur (2019) on his study on development of infrastructure in schools confirmed that the word infrastructure is very broad and there are several features considered when defining it, they include: computer centres, playgrounds, equipment library resources, laboratories, technology, classrooms, machinery and tools.

A study done by Adede (2012) on 'Impact of school infrastructure on provision of quality education in public secondary schools of Nyakach sub-county', Kenya, used descriptive survey design. A target population include 3361 form three students and 48 school managers. 351 respondents formed the sample size. Proportionate sampling was used to choose the sample size, and both quantitative and qualitative data was involved on the study. The research showed that school plant is a major foundation in provision of quality education in all categories of learning institutions. School infrastructure include the following: science laboratories, dormitories, classes, the computer laboratory, sanitation facilities, the halls and the school library. Classrooms are utilised every day for instruction, group discussions and in doing class assignments. The libraries are used for individual study and for students to search for information. The fields are made use of for ball games, athletics and other activities. Teachers and students use the other school infrastructure for the right uses. School infrastructure is very important in providing shelter and comfort when teaching and learning is taking place and in enhancing the standards of

education provision. Different learning institutions have various levels of buildings which are used for effective implementation of the curriculum. The study alleged that increased learners' test score is related to optimal utilization of the available well-built school infrastructure. According to Irfran (2014) school infrastructure are resources that are available in an institution in the form of buildings.

In accordance with Teixeira, Amaroso & Gresham (2017) on their study on why Infrastructure in Education for Learning Matters referred it to be laboratories, buildings, equipment and classrooms. Infrastructure in schools are pivotal components that create a conducive environment for learning in both basic educations and higher institutions of learning. There is compelling confirmation that standard well-built school buildings improve teaching and learning and minimizes the rate of dropping out, amidst many other advantages. For instance, research done recently in the U.K. revealed that both conducive learning environment and well-designed components of the institutional infrastructure made 16 % improvement in pupils' academic performance in primary schools. This study also revealed that school buildings designed in style impacted positively on learning in three interconnected elements namely: the natural environment, school beauty and willingness to provide a conducive environment for learning.

In consonance with UNESCO. IIEP Learning Portal (2005) utilisation of classes is computed by dividing students' entry by the total number of classrooms. The capacity in a class is hard to designate when teaching and learning hours are arranged with few learners in groups that can vary in size based on the studied topics. In upper secondary schools, where learners could be organised in various

classes determined by classroom computation, contrast of classrooms capacity and field of study should be studied with care.

Several schools in various groups of houses in rural areas were persuaded to willingly unite so that they could stick to the least learner classroom ratios in primary schools and ensure quality education is provided (Giordano, 2008: 82).

Conforming to Teixeira, Amaroso & Gresham (2017), learning institutions in Romanian poverty-stricken zones encountered significant investment requirements in the nation, which implicated those learners going to these learning institutions were twice as much underprivileged. Such learners mostly hailed from poor and countryside households which accessed ill-equipped schools. For example, countryside secondary schools which did not have laboratories for science subjects formed 72% and almost 40 % of them were lacking internal lavatory. Nevertheless, despite the institutions of learning being in municipalities which had more education facilities than those in agrarian zones, majority had congested classrooms. The ratio of student being 1:4 in town regions who accessed congested learning institutions, mostly with alternating work timetables. Classrooms which were overcrowded, led to underutilization of instructional practices. This study by Teixeira, Amaroso and Gresham was in agreement with current research which was set to establish the extent to the utilisation on education resources and students' academic performance. Barrett and Shmis (2019) reported that having school buildings which were adequate and with spaces in desirable condition, encouraged children and youth living in remote areas to enhance attendance, motivated both learners and instructors and led to expected academic results.

According to the EFA Global Education Monitoring Report Team (2005), there were several concerns on what made contrasts in increasing education quality in learning institutions. A single deduction was that there were remarkable opportunities that enhanced the methods in which people and physical resources were supervised and utilised in institutions of learning, admitting that the educational institutions is a complicated society that works inside a broader physical, social and political setting.

According to Collins dictionary, a classroom is a room, as in a school or college, where classes are held. It is any place where one learns or gains experience. Teachmint (2020) defined Classroom as a special planned room where students can be taught with no interference. It is expected that learners remain quiet and obedient in a class. A classroom also utilises adaptive learning technology techniques to improve the standards of education for the students. It makes learners who have been deferred to catch up easily with the learning.

According to Organization for Economic Cooperation and Development (2021), in primary schools, the mean class to pupil ratio was 1: 21 pupils in OECD nations. There were less than 28 learners in classroom in almost majority of the states with data available, apart from Chile which had 31 learners per class. In junior secondary schools, the mean class to pupil ratio was 1: 23 learners in OECD states. A round all nations with data available, it differed from less than 20 students in a classroom in Latvia, Estonia, Poland, Finland, Lithuania and the Russian Federation to more than 30 students in a classroom in Japan and Costa Rica. In both primary and lower secondary schools, students in one classroom had a tendency to grow. Learners in Costa Rica increased by 17 in one classroom. Alternatively, in the United Kingdom

and, to a smaller extent Hungary, Chile, Australia, and the Russian Federation, the ratio of learners to classroom declined in both primary and junior secondary learning institutions.

The number of students in a classroom is an element put into consideration by parents when selecting a learning institution for their youngsters. Therefore, the contrast in the mean size of a class in both public and private education institutions (and amid various categories of particular schools) could increase the number of students in one class.

A study done in South West Nigerian Vocational and Technical colleges by Ibukun et al (2011) established that relationship existed between hours, rooms and utilisation of physical materials as viewed by student learning achievement. The study adopted the descriptive survey research design. The sample size for the study was 687 learners. Simple random and stratified sampling techniques were used in choosing the sample. Questionnaire for learners was the tool used for data gathering. The data gathered were analysed by use of Pearson Product Moment Correlation and Multiple Regressions. The four hypotheses were computed at 0.05 significance level. The study showed that physical and material resources were very few and lacked enough and standard workspace like classrooms, workshops, laboratories, lecture theatre for training of the students. The research also alleged that majority of the physical infrastructure were optimally used, which improved the learners academic performance. A significant relationship between utilisation of materials and students learning achievement existed. There was significant relationship between hours, capacity and physical facilities use as viewed by learners learning achievement. This study was with the same accord with that of Niklas, Hogstrom, &

Wallin (2022) who indicated that regular laboratory utilisation significantly enhances sciences subjects' skills and knowledge. Additionally, Laboratory use acts as a catalyst to improved understanding of science concepts which improves test scores in the subjects.

There was dissimilarity between this study by Ibukun et al (2011) and Pareek (2019) who carried out a study to assess the accessibility and usage of laboratory resources for teaching science subjects in public secondary schools in 33 districts of Rajasthan, in India. The method used was descriptive survey design. Stratified random sampling design was used to sample the study subjects which included principals, teachers and students. A total of seven public secondary schools were selected from 33 districts. Questionnaires and focus group discussions (FGDs) for principals, teachers, and students were utilised to collect data. The results for the study showed that majority of the learning institutions that took part in the study none, had isolated laboratories for science. Further, the study acknowledged that majority of the educators had challenges while doing science practicals because classrooms were congested and science resources were insufficient. More reports affirmed that evaluation of science laboratory practical activities was hardly done. Such activities failed to link directly to the high value of learners' academic achievement in science subjects.

According to Fibiger (2023) a laboratory is a Place where scientific experiments are conducted, research and development are carried out and analysis done. Zengele & Alemayehu, (2016) did a study on the level of Secondary School Science Laboratory practicals that enhance the standard of Education in Wolaita region, Southern of Ethiopia. The study too aimed to determine the practice and challenges in science

laboratory experiments in the secondary institution of Wolaita region, Nationalities and People's Region, Southern Nations. This research was done in five public secondary schools from Wolaita region. Purposive sampling method was used to choose the study respondents which included secondary learning institutions and Woreda education offices. Systematic sampling method was used to pick out teachers in secondary schools while vice principals, principals, and Woreda education supervisor expert were picked by purpose sampling method. Primary data were collected from 114 instructors, 8 laboratory technicians, 10 school heads and 235 learners by use of questionnaires, interview schedule and observation guide. Secondary data were gathered by use of document analysis. Secondary data collected were laboratory reports, annual plans and annual reports. The data were analyzed by use of means and percentages. The study findings alleged that the present level of laboratory experiments in Wolaita region secondary learning institutions was below average for instruction of science, there was low utilization of laboratory equipment and reagents. Moreover, there was shortfall of training sessions for teachers and trained laboratory technicians, low morale and negative attitude of educators towards regular practicals and poor assessment strategies on science experiments which contributed to dismal learner academic achievement. This study by Ibukum et al (2011) had similar opinions with Zengele and Alemayehu (2016) who showed that both teachers and learners had negative perceptions on the subject and underutilization of science equipment was common, contributing to poor academic results. This is not in line with the current study which had the opinion that effective use of science related subjects leads to improved students' academic achievement.

Niklas, Hogstrom, & Wallin (2022) did an organised study on laboratory utilisation in secondary learning institution using mixed-methods research design specifically demand-driven approach from 1996 to 2019. The main purpose of the research was to establish the major features leading to effective utilisation of science laboratory in enhancing instructional practices in sciences subjects in government-sponsored secondary schools. Teachers are sampled as the main respondents. The sampled size was 39 studies. The findings of the study recognized that regular laboratory utilisation significantly improved sciences subjects' skills and knowledge. Additionally, Laboratory use acted as a catalyst to improved understanding of science concepts which improved test scores in the subjects. However, learners were likely to understand similar science concepts and came across the same problems as they went through additional theoretical learning activities.

On the same note, Hofstein and Lunetta (2004) have indicated that laboratory studies provided vital opportunities for learners that linked science knowledge with the theories after having hands-on the equipment and reagents. In agreement was Furtak et al. (2012) who did a meta-analysis investigation on the effect of using problem-solving technique in teaching and sampled 37 studies out of 22 articles. The research confirmed that teaching using inquiry method had a moderate influence on learner academic achievement. On the same opinion, Heindl (2019) in a meta-analysis of 13 studies conducted research on the success of a learning processes. The study engaged students by making real-life connections through exploration and high-level questioning in learning science subjects and revealed that there was connection to better achievement of the science concepts. This was due to the use of learning by problem-solving strategy which was in contrast to teacher and

chalk pedagogical methods used earlier. The technique of learning by use of inquiry-based strategy was widely utilised in secondary education than in primary schools, and the largest impact on learning was recognized to be the time taken in prior arrangement on planning the problem-solving lesson (Heindl, 2019).

A study conducted by Etiubon, & Udoh (2020) on Availability and Utilization of Laboratory Facilities for Teaching Carbohydrates in Senior Secondary Schools in Uyo Education Zone, Akwa'. This research used the descriptive survey research method. Three research questions and three research hypotheses were prepared for the study. Questionnaires were used as the research instruments and sample size of 215 of chemistry and biology instructors were purposively chosen from a study population of 218 in the academic period 2018/2019. The research instruments were validated by expert judgment and reliability through split half technique where coefficient of 0.88 was achieved. Analysis of data was done by use of standard deviation, mean and independent t-test. The research findings alleged that limited laboratory materials were obtainable, however, they were seldom used by educators of biology and chemistry. Further, chemistry and biology instructors were to be given advanced training on better utilization of laboratory materials in higher secondary schools in Uyo Education Zone. Majority of the literature reviewed on utilization of laboratory materials showed that many of the researchers adopted descriptive survey method in conducting their studies while the current study adopted mixed methods specifically convergent-parallel research design.

Laboratory resources utilization is the recurrence of use of the attainable laboratory materials when conducting laboratory practicals. The research conducted by Etiubon, & Udoh (2020) had the same opinion with Adebisi, Tewogbade and

Olajide (2017) who affirmed that laboratory resources should be supplied in sufficient quantities, however utilization is hardly ever done when teaching science subjects and hence demonstrated intense necessity to use teaching and learning resources in instruction. Teaching and learning resources also referred as education materials are means that transfer knowledge and notifications from a (place of origin, broadcasting station, and teachers) to the other edge which accepts (learner). This information was agreed by Anyadiegwu (2018) who investigated the level of laboratory materials usage on learners' academic achievement in science subjects and reported that learners who regularly made use of laboratory resources at the time of teaching and learning science attained better grades than those who had limited knowledge in laboratory exercises. Similarly, Neji and Nuoha (2015) discovered that utilization of equipment in the laboratory in government secondary schools demonstrated that 74 percent of the instructors used laboratory materials in instruction in science subject, while 26 percent of the educators totally failed to use laboratory resources. The results once again showed that laboratory materials positively increased students' academic test scores in science subjects. Majority studies were conducted by use on descriptive survey design while the literature reviewed has showed that utilization of the laboratory is a key factor in enhancing the achievement of the learning concepts in science subjects, which in the end improve the learner academic performance. It is from the above studies that encouraged the current study to be done in order to establish the extent to utilization of the laboratory resources on academic performance of students in public schools in Makueni County.

A school library is a building within a school where learners, teachers, non-teaching staff and school community can read, borrow, discuss and search for information from various information resources. The aim of a library in schools is to make sure that all members of the society surrounding the school can use the library materials to search for information, do private reading, group discussions, and lending of textbooks and in utilisation technology resources. A school library has both hard and soft copies of different learning resources while others have Wi-Fi and utilize the Internet besides reading books to acquire information. School libraries are different from public libraries as they function as information bank which support the achievement of some learning needs of learners and in supporting some school programs. A school library functions as the focal point in synchronizing all teaching and learning activities done in the learning institutions (Wikipedia, 2020).

According to Vichea et al, (2018) who defined a library to be an assemblage of reading resources or journals stored categorically for research work, renting books, reference, individual reading and accessing ICT materials. Several elements of library utilisation are integral in ascertaining the performance of students at a learning institution and hence, this study was set to examine the effect of regular utilisation of the library and the studying approach on learners' academic performance. The questionnaire was the study tool for collecting data and a sample of one hundred respondents were selected. The study adopted descriptive survey design. The research findings revealed that a positive relationship existed between regular use of the university library and academic achievement of students. Moreover, the findings of the study indicated that the library has many advantages that influence the way of learning and created a positive attitude towards studies.

Several researchers have shown that utilisation of school libraries led to improved learner achievement. Above 60 studies which were done in 19 United States nations and one Canadian province have confirmed that learners in elementary schools who have highly equipped school library program and qualified school librarians achieved better scores on assessments in reading despite coming from poor environments with most of their parents not employed. Further, another study carried out in Ohio argued that 99.4 percent of learners interrogated had a strong trust that librarians play a key role. A similar information that had the same inference was described in Australia (Lonsdale, 2003).

The school library is important in providing various opportunities for teaching large groups of people and also small groups individuals whose center of interest is on growth of intellectual knowledge and data on reading. Students and teachers together go to the school library while learning is taking place to occupy and utilise the learning space for students. School libraries function as a central location for all of the information available, and a school librarian functions as the key reading guide to all the resources available in the school library (Felmlly, 2010).

Marzoli1 & Papa (2017) carried out research to find out if there was any relationship amid school library and learner academic performance in Italy using a sample of 9896 in learning institutions. Majority of the global studies had established that there were many benefits accrued from optimal utilisation school library by students who were studying. Not long time ago, a survey by the 'IEA PIRLS' had reported a significance association between the performance in reading comprehension by students and the capacity of the collections in the school library. In this particular study, the relationship amid the findings of INVALSI examination in Italian and

Mathematics - on institution's 5th, 8th, 10th grades were based on the availability and utilization of the school library. A questionnaire, which was composed by institutions' principal was used to gather data on the school library during the Self-evaluation review. The findings revealed that improvement was realized in all the grades in the school as well as in the investigated subjects due to optimal library utilisation.

Accordingly, Ogunleye (2016) did research on the utilisation of library and learners' academic performance at Lagos University, Nigeria. Descriptive survey research design was employed for the study and a study sample of 120 learners randomly chosen. The hypotheses were tested at 0.05 significance level. The study results alleged that regular use of the university library enhanced academic performance of students. Additionally, the research confirmed that a relationship existed amid counseling of students and utilisation of the institutions' library. This study by Ogunleye (2016) had similar opinions as that conducted by Marzoli1 & Papa (2017) which showed that optimal library utilisation led to improvement in learning which was realized in all the grades in the school as well as in the investigated subjects.

Okpa, Asibi & Eruvwe (2022) conducted research on library use and its influence on academic performance of students doing bachelors' degree in chosen university libraries in South-South, Nigeria. This study adopted descriptive survey research design and three research questionnaires to direct the study. The sample size of the study was 300 students from the selected university. 300 questionnaire copies were supplied to the respondents, however, only 243 questionnaire copies were returned. By use of descriptive statistics an average and percentage mean score of 2.5 and

higher and 50 percent were termed as realistic. The study finding showed that examination preparation, studying, research, are some of the advantages of library utilization in the university. Measures to enhance usage of the library in order to improve academic performance of students included provision of reliable supply of electricity, availing modern books and provision of training to the students doing undergraduates studies on library utilisation. On the same opinion, Ayanlola (2014) carried out an investigation to determine the effect of school library on academic performance of students in Iwo Local Government Area of Osun State, Nigeria. Information was collected from records of English Language examinations which were taken by three SSS students. Data were analysed by descriptive statistics and analytical technique using the t-test. The research findings indicated that there was significant relationship between supply and use of school libraries on public secondary schools and this increased the quality of academic scores of learners. Thus, it is vital for all learners both boys and girls make regular use of the school library in order to improve on their learners academic performance. The study by Okpa, Asibi & Eruvwe (2022) concurred with the research done by Ayanlola (2014) which showed that frequent utilization of library resources enhances students' academic achievement. This many reviewed literatures created the interest for a similar study to be conducted in Makueni County to ascertain if there would be a contrast or similarity.

A study conducted in Italy by Marzoli1 & Papa ( 2017) has concurred with Olajide and Kutu (2020) who did a study on the effect of school library on learners' academic outcomes in science subjects in town and countryside zones of Ekiti State, Nigeria. The aim of the research was to identify the benefits of science subjects in

order to attain the economic development of the country. The study adopted mixed methods design. The population of the research included school science students, science teachers and librarians in secondary schools. The instruments for collecting data were questionnaires and observation/and document analysis. Information - West African Examination Councils (WAEC) findings gathered were computed to establish academic achievement of learners in science education in town and countryside regions of the nation, questionnaires were used as instruments to collect data which were calculated by employing 'the Statistical Package for Social Sciences (SPSS)'. The research findings showed that many of accessible and utilisation of science library materials that influenced students' academic performance most was the science schoolbooks, and that schools site, being in (town and countryside regions) of the country did not have any effect on the academic performance of the learners. The research has highlighted the irregularity concerning schoolbooks as fundamental library materials in Nigeria, and advised the construction and equipping of more school libraries with textbooks in science subjects, besides daily usage, in order to achieve the dream of the nation's economic development.

The main purpose to set up school library was assists learners to develop standard reading habits for their leisure, create a positive attitude of sharing ideas in discussions, do well in examinations and to search for information on contrasting views on life (George, 2011). A library is a storage of huge volumes and easily accessible information materials in various study disciplines categorically assembled for consumers. A school library is a very vital learning resource centre that helps learners as well as the school community all-round growth. Users of the library use

of the library materials for various reasons including; examination preparation, reading for leisure, personal revision, and group discussions, while others use the library when doing assignments. Ogunbote and Odunewu (2008), alleged that frequent utilisation of school libraries enhanced the academic achievement of students as vehemently disagreed to when they rarely utilised or even completely never used. It is very vital for students to optimally utilise the school libraries in order to give a conducive learning environment where learners can come across and grow both their capabilities and aptitudes besides improving their study skills. Accordingly, Busayo (2011) reported that a school library is an important area of the school system that can greatly improve the standards of schooling in every learning institution. It is hence a vital learning entity in all levels of learning. Institutional programs lacking libraries prevent learners from achieving academic excellence and always realize it is hard to carry out researches related to education prior to entry into tertiary level. In research linking to the relationship between utilisation of library resources and academic performance of learners by Anyadike (2000) found out that students enhance their grades when they frequently utilise the institutional libraries than when they failed to. According to a study by World Bank (2008) on school library provision and reference books in secondary education in Sub-Sahara Africa, showed that libraries and textbooks were both insufficient and unfairly dispersed among the country-side and town schools within the locale. This led to underutilization in most of the rural areas and contributed to low grades. This study finding by World Bank (2008) agreed with Jean (2021) who showed that when libraries are not adequate, it led to disinterest and low reading culture by the students, leading to very limited usage and a declined performance.

This part has looked at several literature reviews concerning library utilisation and academic performance of students. The studies contemplated on various goals from contrasting areas of the globe and each and every study adopted different methods, approaches and designs, however, majority agreed that there is significant relationship between library utilisation and academic performance of students. Conversely, the study aimed at learners in the 4<sup>th</sup> form in public county secondary schools, adopted a mixed methods approach, specifically convergent-parallel study design, thus quantitative as well as qualitative methods of data gathering and analysis were employed.

According to UNESCO: UIS, a computer laboratory is a continuous area supplied with computers with pedagogical content; for the purpose of teaching and learning in a learning institution. Teachers and learners should have authority to the credentials in order to gain permission to access learning materials. A computer lab is a room in which computers connected with internet and provide services to particular people. Academic institutions and public libraries in general offer such services. There are rules and regulations that govern the users for the purpose of gaining access to the computers. There are several items and equipment that should be equipped in a computer lab they include computers, keyboards, monitors, modems, printers, speakers, scanners, disk drives, cameras, and multimedia projectors like Kyan, Chrome books, and Whiteboard (Wikipedia 2022).

Frigaard (2002) carried out a study to find out whether taking part in a computer lab would enhance learners learning outcomes on grammar, listening comprehension, and vocabulary in Spanish in senior schools. Students were involved in various activities in class and also in the computer laboratory. The study was conducted

using student surveys in 5 subjects. The target population was the learners. Analysis was done based on information from students. The findings showed that the computer laboratory was advantageous to a few learners much more than others. Some learners' better-liked ground was on computer laboratory activities than on Spanish study Web site and a grammar teacher. Their best-liked activities in class were games and cards with Spanish words. Majority of the learners suggested having a teacher in the computer laboratory in order to improve their capabilities in learning. Almost all the learners were amused by frequent sessions planned in the computer laboratory. Majority of the students were convinced that skills in listening in the computer laboratory increased greatly and made learning very enjoyable. Learners said that they liked most learning skills in listening in the computer laboratory, at the same time, learning grammar and vocabulary in the classroom. Their achievement in learning were assessment marks for four units as follows; the learner survey, study in vocabulary, student survey finding for Spanish 2, and attainment in learner survey for Spanish 3. Thus, utilization of the computer laboratory improved outcomes on grammar and listening skills in Spanish. This finding agreed with the current study that optimal utilization of school resources would improve learning outcomes of secondary students in Makueni County.

Based on Newby (2002) who conducted research to compare the Environments for Learning of Open and Closed Computer Laboratories. This study examined the variations amongst learners' opinions of several facets of the environment for learning of open and closed computer laboratories, and besides did an inquiry on distinction in learner academic achievement from classes that used these two plans and procedures to order computer laboratory classes. The utilisation of closed

laboratories needs a large number of resources with regard to infrastructure and tools and high dedication on behalf of the teaching staff. This study researched on whether additional inputs and devotion of tutors to work contributed to better learner achievement. The study employed an inventory and questionnaires as the instruments for data gathering. The study findings revealed that there was great contrast between the averages for Open Endedness, Laboratory accessibility and Technology obtainability. There was no mean contrast for anxiety among the learners and lastly, there was no improvement of students on academic performance on the course units. The study of Frigaard (2002) was in disagreement with this research by Newby (2002) which revealed that there was no improvement of students on academic performance on the course units, however, it had the same opinion as the one conducted by Phumorn & Kularbphetong (2019) that there was high significance of the elements relating to quality of service and it extensively improved the service knowledge and service mind aspects of the users.

Phumorn & Kularbphetong (2019) did research on aspects impacting on Service: The computer laboratory utilisation of students and staff in Suan Sunandha Rajabhat University, Thailand. The data gathering instruments for the research included questionnaires and interview schedules. The study adopted descriptive survey design, and a sample of 136 respondents was selected for the study which consisted of students as well as the faculty members. Collected data was analysed using both descriptive and inferential statistics. The study findings showed that there was high significance of the elements relating to quality of service and it extensively improved the service knowledge and service mind aspects. The study confirmed that the elements of the greatest importance were those of service of computer laboratory

utilisation of learners and the staff which were the knowledge service, mind service and the support of the organization respectively.

A study done by Ibukum et al (2011) on utilisation of resources and the relationship on student academic achievement in chosen Technical and Vocational Education and Training colleges in South West Nigeria. The study employed descriptive survey study design and sample size of 687 learners. The sampling strategies used to choose the study sample included simple random and stratified sampling techniques. The tool used for data collection was a questionnaire for the students. Pearson Product Moment Correlation and Multiple Regressions were used to analyze the collected data. The study showed that majority of the infrastructure facilities were used effectively. Hours set aside for different activities in vocational and technical sector were optimally made use of apart from athletics, ball games and the forum for students. Students' academic achievement had improved as was expected. Use of school infrastructure strongly enhanced learning achievement of the learners. Space, time, and utilisation of infrastructure materials had significant relationship between learners academic performance.

#### **2.4 Utilisation of teacher resources and its influence on academic performance of students**

Utilization of teacher resources is the effective and efficient use of teachers in schools to ensure optimum achievement of goals and objectives and evade wastage (Rafiei, 2015). Teachers commit their time to use all the other institutional resources in teaching, planning, marking exams, managing and mentoring. Teacher resources consist of a very important part of all learning institutions. Their capability is paramount to other forms of resources (Burke et al, 2013).

According to UNESCO: IIEP Portal the rate of utilisation is computed as the real number of teaching time compared to the ideal period of utilisation:  $U. T. = (\text{actual number of units taught} / \text{ideal number of lessons to be taught in class}) \times 100$ . For instance: If, in reality, every class can be used for 50 teaching lessons in a week, and that class is used for only 25 lessons in a week, its rate of utilisation is  $(25/50) \times 100 = 50 \%$ . This indicates that the number of learners could be twice those given in a class without having to construct a new room. This rate of utilisation could be computed for every kind of room (mostly those for instructional reasons, example science laboratories in schools) or for all the rooms in a learning institution. It is difficult to calculate a rate of utilisation above 80 %, because of the complexity in planning timetables for various course units. Additionally, it is not allowed: if the utilisation rate is 80 %, suggestions are that different units could share one classroom. Therefore, it is essential to have a room unoccupied, which can be used by learners for individual study periods (defined by IIEP). Maximum utilization of instructors indicates that teachers effectively teach to a certain extent that acknowledges the needs of learners as well as to address the challenges facing the education sector, educators' ambitions and strong interpersonal and communications skills (Gottelman-Duret, 2000: 9).

Several connected studies have revealed some information from the growing nations, that detailed research, specifically on two main facets of systematic utilization of instructors include: the initial one connected to maximum allocation of teachers by, ensuring they had the right qualifications and had remarkable experience and were spread-out to where there was high teacher shortage, and special consideration made on choices and personal attributes. Secondly, essential

features on improving utilization of teachers were connected to the way in which commitment of teacher could be increased in order to improve quality, personal growth, promotion to higher cadres and other French benefits.

In accordance with EFA Global Education Monitoring Report Team (2005), education quality is highly improved by teachers who are termed to be the main implementers of the curriculum. Numerous reports indicated that instructors are essential on reforms for improving the standards of education. Further, educators served to express by a great amount the leading body in receiving high government allocations.

Burke (2013) conducted research on the number of children being taught by one teacher and size of the grouping as the two main ways used to determine quality of education at Kaimai learning centre, an early children's school in the municipality of New Zealand, and the Kindergarten of Oka in the country-side zone of Hokkaido, Japan. They used fieldwork to collect data by participation and observation. The discussion on this paper was that effective teachers were unevenly distributed in the World and trust about the quality of education was always aided by influential philosophies on the context of early childhood education, The findings showed that in Japan, there were high instructor–pupil ratios which contributed to decline in the standards of schooling unlike in New Zealand which had conducive environment for learning cushioned by low teacher learner ratios. The importance of teacher resource utilization is that they add value to the school and their collective efforts, conduct and competences contributed to desired performance (Burke, 2013).

According to Education Reforms (2014) a learner-teacher ratio is the association between all the students admitted in a learning institution, or sector of education and

the total number of constant teachers hired by the system of education, a pupil-educator ratio of 10:1 suggested that one continuous full time teacher attended to ten learners. In government sponsored schools, the term '*full-time equivalent*' (abbreviated as FTE) is an approved quantity of total number of teachers teaching both permanently as well as temporarily hired educators were referred to as a single 'Full-time Teacher Employment' (FTE).

The ratio of learner to instructor has been confirmed to be one of the most powerful measures of learners' academic achievement and commitment. By reason, it was an astonishment as to why the less the number of learners attended to by one teacher, the more likely those learners would grasp the learning concepts better, further, they would get used to the teachers teaching strategies and gain more confidence in inquiring for clarity on where they failed to understand. They also formed a close conducive tutoring associations and guidance which was highly favoured by classes with few numbers of pupils. Correspondingly, when the number of teachers were many in a school, their workload was light, and enabled them to have time to adequately prepare their lessons, thus, their central focal point would be on improving the quality of teaching and also enhancing performance standards of the learners.

In groups with few students, they were freer to share their ideas, inquired more and gained confidence in learning, enabling the teacher to learn all the learners' needs and capabilities. This enabled the teachers identify learners with learning challenges in various subjects which provided the educator set aside enough time for individual coaching and upgrading students to be in par with the high achievers. In congested classrooms, with high student-teacher ratios, students who were disadvantaged in

learning were left struggling to improve by inquiring from their peers and hardly benefitted from their teachers, who had limited time to identify their learning needs. Eventually, they were likely to drop out or achieved dismal academic learning attainment. Smaller classes benefitted students who did well and tapped their full abilities, teachers would have the capacity to deal with this state, give the learner more resources and assisted them to excel to the best of their capabilities. Instructors would also extend their communication with the learner's parents, discussed and addressed any issue hindering high success of this learner, this endeavor motivated both the teachers as well as the students leading to academic excellence and high chances to graduate.

According to the 'World Data Atlas: Rankings in Education' Nepal was the leading nation with pupil-teacher ratio in secondary schools globally. In the year 2016, the ratio of student-educator in secondary schools in Nepal was 28.9 pupils per teacher. The other leading 5 states were as follows: Sao Tome and Principe, Djibouti, Ecuador and Palau. Secondary school student-instructor ratio is computed as all the learners admitted in a secondary school divided by all the teachers at a secondary school (not considering their teaching subjects). In 2010, the number of learners being attended by one teacher in Nigerian secondary schools was 23.2 pupils per teacher. This high learner-instructor ratio in secondary schools had declined significantly in the latest time, it dropped in the years 1979 to 2010 stretch at 23.2 pupils to one teacher.

The number of students per one teacher varied from country to country, and according to the amount of funds allocated to the education sector in the particular nations. Low learner-teacher ratio countries pay extra funding to hire adequate

instructors and train them. Categories of school; government sponsored schools, for instance, tended to have congested classrooms and limited number of teachers when compared to personalized day or boarding learning institutions, which usually had smaller classrooms and high number of teachers, besides, marvelous academic achievement.

In the U.S., classroom sizes had substantially been on the downward trend, from a mean of learner-educator ratio of 22:1 in 1970 to 15:1 in 2008 stretch. This tendency was encouraging suggesting that the systems of education identified the benefits of decreasing the number of learners in a class to the greatest extent. Lower student-teacher ratio suggested a more significant and learner-centred teaching strategies.

Francis (2018) did a study to determine the effect of utilization human resources on institutional development and growth of State Polytechnic of Yola. The study used descriptive survey technique. The total sample size consisted of 271 respondents. And questionnaires were used as the tool for data collection. The study results alleged that utilization of labour emphatically and remarkably affected the broadening and evolution of SPY. The research confirmed that as optimal usage of the manpower was a plan of action, thus, companies should guarantee that there was a utilitarian manpower section that would invariably be receptive to the human resources requirements of the corporation. The activities teacher resources do for the purpose of attaining learning goals and objectives in schools are described as teacher resource utilisation. Appropriate use of teacher resources is vital for institutions' growth and survival especially during this time when there are myriads of challenges such as insecurity, mismanagement of resources and climate change which are experienced globally in schools. Teacher resource utilization plays a major role in

formulation of schools policies and implementation of government policies. Their effective utilization to other institutional resources determines the success or failure of the educational system. Teacher resource utilization is the way teachers are deployed for optimal achievement of individual or collective school goals and objectives. This study by Francis (2018) concurred with that one of Burke 2013 that low teacher student ratio positively influenced performance of students.

The manager of a school ensures coordination and supervision of all school matters, so that everything runs smoothly (Egwu, 2016). Strategies are made, duties delegated to all the teacher resources, work standards set and maintained to ensure available resources are effectively used through embracing management ideas for the schools to realize the set goals.

A study carried out by Nwuche & Awa (2011) showed that teachers operated all the activities of the institution for it to achieve superior performance. The performance of a school relied on the instruction skills teachers had and how institutions developed them professionally. Academic results depended on the teacher resource growth and the increase of more information on utilization of institution resources. Further, teachers' performance was greatly determined by their qualifications, motivation, attitude, and the education facilities as well as staff professional development programmes (Ndugu, 2014).

According to the Hun School of Princeton (2019) the mean of pupil-teacher ratio in New Jersey's changed according to category of the learning institution. In the whole nation, government sponsored schools commonly had high student-teacher ratios, followed by individualized schools and lastly learning institutions that provided accommodation and meals. Schools that had the least-instructor ratios were those

that learners got meals and accommodation, reason being their core business was provision of high standards of education and high academic performance. These differences were hereby shown below: State-sponsored schools had an average number of learners taught by one teacher as 12 is to 1, these schools receive low funding and the issue of minimizing the class sizes and employing a bigger number of teachers remained a nightmare. In this scenario, learners with learning challenges or were gifted, failed to get close learner-teacher attention and therefore performed poorly. The average ratio of pupil to teacher in Personalised day schools in New Jersey was 11:1, and lastly in learning institutions that provide accommodation and meals had an average learner-educator ratio of 7:1. This very small classroom sizes and highly advantaged the learners to the greatest extent. In this scenario, learners received very close teacher concern and allowed them give their opinions, asked questions, got good instructor clarifications and achieved the best education quality. On the same note, teachers could identify their particular learning needs, gave tailored learning contributing to high academic achievement.

Similarly, Kabazira (2010) who did a study on utilization of instructors and learners' academic scores in secondary schools in Kabarole District, Uganda, using cross-sectional survey design and gathered qualitative as well as quantitative data methods. The study established that classes which had many students and the schools were understaffed, had high student teacher ratios and teacher student conduct time was lessened. This affected the performance negatively.

Blazar (2016) did a study on instructor teaching practices on academic performance of learners, attitudes, and behaviors. The study adopted descriptive survey research design and sampled teachers in four town school districts. The research tools

included observation schedule and document analysis. The findings of the research showed that there was strong relationship between teachers in the senior schools and students' perceptions and their academic achievement, and that the way they applied their teaching strategies influenced student learning. Further, the class arrangement by the instructors, their mastery of subject content and learners' attitude towards learning led to quality academic achievement. This finding by Blazar (2016) had the similar opinion with Kapur (2019) that revealed that human resources were the employees who, in order to discharge their duties effectively needed to get in-service training every time in order to improve their competences and capabilities. On the same note, Iheonunekwu (2012) on the study of presence and management of pedagogy resources and learners achievement in Senior Secondary Schools in Abia and Imo States. The study found out that effective use of instructors connected well with adequacy and standard teaching and learning resources, and that taking them to regular refresher courses was of paramount importance as their knowledge content was upgraded and also mastered.

The EFA Global monitoring report 2005 reported that in majority of the growing nations, the education system needed complex strategies on how limited resources were utilised in our learning institutions and mostly in primary schools where admissions had rapidly bulged without commensurate growth of dispersed monies. Various shifting in schooling was an alternative that enhanced the provision of places in schools by systematically using the accessible resources in learning institutions. A lot of pressure was mounted on those in-charge of school management, but, necessitated a probable decline of quality. This needed extra-careful organization and suitable established arrangement.

The education quality that all learners achieve in all learning institutions was determined by number and allocation of the employed educators', their experience, qualifications and training. The most discernible component of instructor distribution at school level was the extent to pupils-teacher ratio, and level of academic achievement was determined by the number of learners in a classroom and teaching and learning practices. In majority of the growing nations, very high learner-teacher ratios were witnessed in primary education and the environment for learning was not favoured by this condition. In regions where there was low primary school coverage, youngsters required lower pupil-teacher ratios less than the recommended mean. This was because these learners needed to receive one-on-one attention from their teachers, moreover, they were termed to be pupils from needy and deprived members of marginalized communities, which not only knew the native language, but they never spoke it, though it was the language used in teaching and learning (EFA Global monitoring, 2005).

In accordance to Akinsanya (2010) who conducted research to determine the relationship between teacher allocation and usage and academic achievement of learners in government sponsored schools and private learning institutions relating to central government. The study findings showed that there was shortfall of institutional resources which led to underutilization in both public schools as well as federal institutions of learning. The shortage and ineffective use of some of the institutional resources like the libraries and laboratories had a negative impact on the academic attainment of pupils. At the same time, Adeyemi (2010) alleged that, the quality and functions of school libraries in majority of the growing nation especially in Africa was substandard, one of the measures of school libraries in the wealth

nations was The American Library Association which indicated that at least 20,000 collections of units for a learning institution of 500 learners or below, had a ratio of 40:1, when compared to the approved amounts of units in the rich nations. This high ratio of library provision affected negatively the level of utilisation. Globally, resource allocation in Libraries was very vital in improving instructional practices even though this was given very limited concern.

According to Education at a Glance, OECD (2011), the median surrounded by OECD nations, had the ratio of students taught by a single teacher being 14:1 at the senior schools. The disparity in learner-instructor ratios suggested, there was less FTE (Full Time Equivalent) learners to FTE instructors at the secondary schools than at the primary schools.

Based on OECD (2019), the number of students being taught by one teacher is determined by distribution of education resources. Instructors in schools in which classrooms had few students taught by a single teacher were highly paid, had better allocation of funds set aside for both professional development and in technology resources and use, additionally, the schools widely utilised assistant teachers who were lowly paid.

Classes which had few learners were advantageous as teachers could identify individual learners' needs and had decreased class hours termed as advantageous. They could let instructors pay special attention on learner needs and minimize classroom hours for handling disturbances. In addition, there was remarkable proof that smaller class sizes advantaged particular category of learners, including those from impoverished homes (Bouguen, Grenet and Gurgand, 2017), in general, confirmation of the outcome of the number of students in a class and performance

was variegated (OECD, 2016). Class size variation after some time showed possible disparity in the provision of educators in contrast to demands of the learners. Several nations came across challenges in hiring new instructors to manage the increasing number of pupils, yet others had a challenge of regulating the decreasing learner admissions with high number of teachers (OECD, 2019).

According to GoK (2019) teachers are very essential in meeting the standards of education. They remain to be the main curriculum implementers directly dealing with learners and thus they should be adequate and meeting the required qualification as approved by their employer in order to satisfactorily maintain the provision of high value of education.

During 2019, important information had revealed that majority of the teachers were employed by the government. In the both junior as well as the senior schools, it had hired 76.17 % and 89.48 % respectively.

The same information confirmed that the recruitment of teachers in the non-public section substantially decreased with the development of the basic education level. Provision of quality education was strongly determined by class size per teacher. Small classroom size per one instructor highly increased the value of learner academic achievement.

There ratio of pupil-educator level in pre-primary was 37 pupils for every teacher in public pre-primary schools, revealing that they had not achieved the approved ratio of 25:1 with a difference of 21:1 in individualized centres. The learner-teacher ratio for government primary education was 39:1 while in personalized institutions primary education, the ratio was 24: 1. The country's learner-teacher at primary education level, considering student-educator in government as well as non-public

schools was termed to be satisfactory when contrasted to the worldwide standards of 40:1. Nevertheless, in government primary learning institutions in the nation, the policy of PTR is 40:1, not regarding the learner admissions, in Kenya.

At the senior education level in the country, class size per instructor is 29:1 and 19:1 for government and non-public secondary level respectively. The learner-teacher ratios are less than the approved standard of a classroom of 35 learners per teacher. In whatever way, the nation considers norms of staffing regulated by the Curriculum Based Establishment for every learning institution. In this context, the size of educators is controlled by the units taught and leadership roles for every school (GoK, 2019).

A study conducted by Khan & Ghosh (2016) showed that low standards of teaching was associated with drop in performance of students. The tendency applied to almost all types and levels of learners. Nassira (2016) on his study established that competent teachers were highly trained and had adequate abilities to effect positive student success. The study by Nassira (2016) had similar opinions with Grichland (2017) who revealed that teachers who had the right training rendered standard services, were competent and confident, their capabilities and positive attitude could change the overall behaviour and academic performance of every learner in schools. This finding by Akisanya (2010) concurred with Ekpenyong, Okon & Imo (2016) who ascertained that regular attending of workshops, in-service training seminars and refresher professional training courses by instructors impacted positively on learner academic achievement.

On the same context, (Simiyu 2013) who did a study to determine the factors affecting the academic performance of learners in public secondary institutions of

learning in Trans Nzoia West Sub County using correlation of multivariate analysis. The study subjects included students, principals and teachers who were selected by stratified and purposive sampling methods. The sample size comprised of 159 respondents, which included 98 learners, 51 instructors and 10 principals. The study findings confirmed that physical resources that influence best academic performance of students in learning institutions were the existence of a library with the right types and number of books, pertinent text books, teachers resources who have had the relevant training, classrooms which are adequate, as the elements that play the most important part in leading to satisfactory academic performance of students. This finding concurs with Jean (2021) who showed that when well-stocked libraries are not available, it leads to disinterest and low reading culture by students thus leading to lessened performance.

Similarly, Konyango, Ogeta, Otieno & Orodho (2018) carried out a study on institutional resources that led to dismal academic attainment in physics subject by learners in secondary education in Ugenya Sub-County, the study employed cross-sectional study technique. The study subjects were selected by use of Purposive sampling methods and a sample of 228 respondents was chosen. Structured interviews for the principals and questionnaires for teachers and students were the data collection tools. The study findings established that inadequate trained instructors in physics and unsuitable laboratory equipment essential for producing the intended results in physics were the primary consequences that contributed to low learners achievement in the subject. The educators rarely used learner-centred teaching approaches and both teachers and students had negative perceptions in doing well on the subject. Further, essential learning materials like textbooks and

equipment for practical assessments were also in short supply. This finding is also in agreement with (Mwaniki 2011) that inadequacy of teachers may contribute to students' ineffective teaching in those particular schools.

According to with Bello (2012) who conducted research to examine the accessibility and utilization of Laboratory Equipment for physics instruction in high schools in Nigeria. The study adopted descriptive survey method. The study sample of 900 learners was selected by use of simple random technique and purposive sampling techniques. The research tools included questionnaires and checklist for the science equipment. The results showed that the optimal utilization of physics laboratory equipment was effective in the teaching of Physics. The federal learning institutions had the maximum utilized Physics Learning Equipment and had attained the highest mean score, the private schools followed and lastly the government sponsored schools that had the least utilization capacity of Physics Learning Equipment and the lowest mean score. This indicated that low learner academic outcomes in learning institutions persisted if irregular and ineffective use of institutional resources by instructors, students and administrators. This study by Bello (2012) examined the accessibility and utilization of Laboratory Equipment for physics instruction in high schools in Nigeria using descriptive survey method. A research gap existed on the locale of his study and the research design used where the current study was conducted using mixed methods approach, specifically convergent-parallel research design in Makeni County, Kenya.

In Brazil, Jordan, Argentina, the United Arab Emirates, Uruguay and Kazakhstan, heads of secondary schools protested that limited school facilities prevented effective utilization to a lower extent than in the OECD countries. Inadequacy of

these learning resources hindered their maximum utilisation and had a negative influence to learning. Therefore, effective use of institutional learning resources enhanced students' academic performance to above average (OECD, 2013). On the same note, Gamoran, Secada and Marrett (2006) concluded that what contributed most to improved learner grades was not the availing of resources, but their standard and how effectively and efficiently they are put into utilisation. For this reason, therefore the researcher was encouraged to determine utilisation of institutional resources and academic performance of students in high schools in the selected locale.

In accordance with The United Nations Educational, Scientific and Cultural Organization (UNESCO) approved an educator-learner ratio of 25 students per one teacher for primary education. This ratio is according to several studies done in different areas that revealed that few pupils with smaller classrooms achieved better academic grades.

Kenya's present approved teacher-learner student ratio is 40: 1 (Soko Directory Team, 2022). Nevertheless, there several areas of the nation which have congested classes of seventy learners per one teacher. This is much higher above the advocated ratio of UNESCO, and it is among the topmost student-educator ratios globally.

A study done by Murungi, Mutwiri and Wambua (2018) on school infrastructure and methods instructors used to enhance performance of learners in social studies in Makueni County, Descriptive survey design was adopted for the study. Simple random sampling and stratified random sampling methods were employed to choose school types and teachers who taught in lower primary school. The study sample was chosen by use of purposive sampling method. Observation schedules and

questionnaires were the data collection tools. Content validity was ascertained by use of study instruments. The study findings revealed that the atmosphere in the lower primary school classes was not favourable for pupils to effectively learn social studies. Further, availability and utilisation of physical facilities in social studies was substandard as learners clambered hurriedly for the resources that had been obtained, contributing to low performance in social studies subject.

Several studies have been reviewed showing that different findings have been achieved in different regions of the world and by use of various research designs. Majority of these researches were done in basic education system and in tertiary and higher education institutions mostly by use of descriptive survey designs. This current study was conducted by use of mixed methods approach, specifically convergent-parallel research design. Few studies have been carried out on utilisation of teachers resources and more so in Makueni County. Therefore, this research was set to determine the utilisation of teacher resources and students' academic performance.

## **2.5 Utilisation of instructional materials and its influence on students' academic performance**

Instructional materials utilisation is the practical use of teaching and learning materials that assist the instructors in delivery process and eventual enhancement of the attainment of learning goals and objectives.

According to Lewis (2018) instructional materials are referred to in another name as the teaching and learning resources, these are resources that have been put together for the purpose of making instructors create a friendly teaching and learning atmosphere that enhances effective achievement of learning objectives. Some of

them are people and material resources, animate and non-animate objects. Instructional resources are very vital in helping learners internalize learning concepts by making learning more real and enjoyable besides help students to develop curiosity in the process of learning, thus keeping them attentive and interactive. They are instruments used to help accomplish the teaching and learning activities, which are as follows active learning and assessing whether the learning objectives have been achieved. Based on Global Dictionary (2019) the term surrounds all the resources and physical infrastructure that teachers utilise to practically teach and improve students' academic outcomes Wikipedia (2018). Different instructional resources are grouped as follows: *audio*; microphones, cassettes and podcast, *Print* materials which include textbooks,; handouts, pamphlets, manuals and teachers' guides, *Electronic Interactive* ; which are graphing calculators, computers and tablets, *Visual* ; photographs, charts, transparencies and real objects, lastly we have *Audiovisual* which are films, filmstrips, slides, tapes, video, televisions and multimedia.

Njuguna (2018) carried out a study to investigate the availability and usage of instructional materials in teaching biology in secondary schools, mostly print and non-print materials in Nairobi County using descriptive survey research design. The target population for the study included teachers and form three learners doing biology subject in secondary schools in the county. Purposive sampling technique was employed to sample the schools, teachers and principals. The instruments used to gather data from the sampled respondents included observation guide and questionnaires. The findings of the study affirmed that effective utilization of instructional materials not only requires a lot of creativity but also being

knowledgeable with regard to the content. Further, frequent utilisation of instructional materials provided hands-on activities to the learners maintaining their attention and curiosity to the end of the lesson. This assisted learners to grasp the learning concepts with ease, thus, contributing to better learning outcomes. This study by Njuguna (2018) agreed with that of Nsa, Ikot and Udo (2013) who conducted study to establish the consequences of using teaching and learning resources in agriculture and the academic achievement of secondary school learners in Ikot Abasi Local State Zone. Quasi-experimental research design was used for this research, pretest and post-test control groups were non-randomized. The sampled respondents included 200 learners. Questionnaires and students' scores were used to collect data. Data gathered was analysed by use of both descriptive and inferential statistics. The four hypotheses were tested by use of the t-test and the Analysis of Covariance (ANCOVA). The results of the research alleged that gaps existed between those learners taught using, charts, maps, equipment and tools than those whose instructors used explanations or lecture methods, as the former achieved the learning of concepts better. Additionally, teaching agriculture by use of practicals made the subject more real and learners were livelier and enjoyed the lesson.

As stated by UNESCO (2008) supported these statements that practical teaching and learning related positively to academic achievement of students and this created concern for the current study that investigated how utilization of teaching and learning resources, such as charts, pictures, tools and equipment , science equipment influenced the academic performance of students in secondary schools in Makueni County.

As reported by Dhakal (2014), instructional materials utilization is the use of instruction resources in real learning at a specified time compared to the actual time needed to use the particular instructional materials. This helps to facilitate learners' acquisition of knowledge and skills and aid in improving the overall quality of learning experiences at institutional levels. Instructional materials of interest in this study included; diagrams, posters, print and digital materials, lab equipment, microscopes and real materials. Instructional materials are tools instructors use to facilitate learning and achievement of lesson objectives successfully. They include textbooks, flow charts, tables, posters, print and digital materials, books, charts, diagrams, handouts, tests, quizzes and projects (Janovsky, 2015). These materials bring forth effective pedagogy and meaningful learning. Utilization of instructional materials in schools helped the learners understand learning objectives and improved academic grades. Isola (2010) reviewed instructional materials as items such as learners' books, teachers' guides and charts that make a lesson more real, interesting and much clearer to students, besides assists the teacher to achieve lesson objectives.

According to Scheerens (2000) several education indicators had shown significant influence on students' academic performance and that every education stakeholder needed to pay special emphasis to included: actual hours a teacher has used up in class teaching specific subject (minutes-on-class activities), instructor-learner interplay, hours spent by teacher and student on doing assignment. Also included were learner individual attention, appropriate and continual learner assessment, institutional administration and services that support the school management (United Nations Educational Scientific Cultural Organization Education, 2010).

According to EFA Global Monitoring (2005) report, the accomplishment of instructional process is significantly related to resource accessibility and the correct methods of making use of them when all other factors are kept constant. It is true to say that institutions of learning provided with insufficient schoolbooks, educators, or other instructional resources would definitely fail to achieve their set learning goals. In that regard, the standards of education are directly influenced by the supplied resources and utilization, though further research is needed to confirm such facts. Education materials are important in increasing learner academic outcomes to a great extent only after considering the variety of resources and how they were optimally put into utilisation. The major education resources include teachers and material inputs. Teachers are hired by the government, either in permanent terms or as interns, and in few cases by the school board of management. Non-human material is listed as follows; physical facilities like chairs, cupboards, schoolbooks, science equipment and reagents, school buildings which are supplied by both the state as well as the community. Instructors are the most essential in implementing the curriculum and produce quality learning outcomes. Other important parameters in determining provision of quality education include size of classroom per instructor, mean teacher wages and the relative amount of money assigned to several elements in education. Both human as well as non-human materials are mostly evaluated by disbursement signals, inclusive of school infrastructure.

In the developing nations, there has been additional funding for more supply of schoolbooks, hiring of more educators to reduce the ratio of pupil per teacher, training of teachers to update and improve their pedagogical skills and increased institutional resources. This is connected to significant improvement of learners'

academic outcomes. Despite the fact that in the developed nations, the disbursement of money towards the supply of education resources and training of educators was more than in the growing countries, academic performance of students is not matched to the sufficient number of school materials. High standards of education could be attained by moderate funding that was affordable in low-income nations. However, the rates of repetition in schools were inflated in the growing countries and the fair improvement of education quality was to some extent related to self-generation of funds, however, the period of time learners took to finish the education cycle was greatly decreased.

According to Harold (2015) who did research on both growth and assessment of instructional resources in differential equations in the curriculum for engineering students in Philippines. The researcher adopted descriptive-survey research method. The assessments were dependent on the least requirements of the Commission on Advanced Education for engineering courses in the Differential Equations unit in Philippines. The research revealed that the progress and utilisation of resources enhanced the performance of students and quickly reacted to high requirement for engineering programs. This study by Harold (2015) was carried out on university learners in Philippines. The current study was done in secondary school students in Kenya. The gap is that the present research was conducted in secondary schools unlike the reviewed study which was done in a university.

On the same opinion of Gopal, Singh & Aggarwal (2021) who carried out a study to determine the impact of virtual learning on students' contentment and achievement during COVID-19 pandemic. The study employed descriptive survey research design. The data was gathered from 544 subjects who were learning hotel

management or business management courses in universities in India. The research instruments included structured questionnaires that targeted the audience by usually filling out forms virtually. Structural equation modeling was employed for data analysis. The research findings showed that the teacher value, course method, immediate response and learners' expectation significantly influenced students' contentment. Additionally, the satisfaction of the learners improved their academic performance. Lastly, students who learned through the internet did better academically than those who didn't get chance to use it for courses they learnt online.

As stated by (Wali, Abulfathl & Mustapha 2019) who did research on the effect of class learning surrounding on the achievement of pupils in the English subject in senior secondary schools in Maiduguri, North-Eastern Nigeria. The study adopted Correlation and Survey research methods. The study population included 183 educators and 2003 form three secondary students in the chosen learning institutions. The sample size involved 401 learners and 183 teachers who were chosen through random sampling methods. The tools for data collection included questionnaires which were personally prepared and proformas. The study findings affirmed that conducive class environment significantly influenced learner academic grades in English language. Additionally, learning achievement of students was not influenced the by the gender of the learners. Thus, it was confirmed that a friendly classroom environment could be provided only if the school administration supplied all the needed education resources to enable total growth of the learners. This finding disagreed with Omariba, Ondigi and Ayot (2016) who conducted in Kisii County, Kenya and showed that the ICT resources were adequate in most of the

piloted learning institutions and even though educators recognised the full worth of the part played by teaching and learning using instructional technologies, they barely made use of the technologies available in their schools.

Ogan & George (2016) did research on the feasible impact of charts' utilisation on learners' mastery of measurement ideas using collaborative and substantiation of teaching and learning techniques. The research adopted quasi-experimental research method. The target study population was 800 high school students in Okrika Local Government Area of Rivers State Nigeria, whereby 105 learners were sampled. The study tools were questionnaires prepared on understanding of measuring ideas. The gathered information was analysed by use of descriptive statistics such as standard deviation, averages and percentages and results displayed on tables and graphs. The hypotheses were tested by use of significance level of .05 and calculation done using Analysis of Covariance (ANCOVA). The research results expressed that student taught using demonstration and teaching learning method with charts gained the concept of measurement better than those taught with group discussions strategy without charts. Further, a difference existed between the academic achievement of learners taught using the method of demonstration without charts and those taught using charts and group discussion method. There was also a difference between male and female learners gaining the concepts of measurement when taught using charts and demonstration method than those taught using the collaboration method without charts. The study also advised that educators teaching mathematics should utilise measurement with charts in employing demonstration method. This study was in agreement with (Wali, Abulfathl & Mustapha 2019) who affirmed that that

conducive class environment had a positive influence on learner academic grades in English language.

As claimed by Adalikwu and Iorkpilgh (2013) who did research to find out the effect of teaching and learning resources on the academic achievement of students in high secondary school in the chemistry subject in Nigeria. The study employed quasi-experimental method. The study manifested that learners who were taught using the teaching and learning materials improved greatly than those who the researcher kept them away from the use of instructional resources and so they performed dismally. Further, the utilisation of teaching and learning materials in general increased the capabilities of understanding of learning concepts by students and contributed to better improvement in academic performance. The study confirmed that for learners to enhance their academic achievement, teachers should always make regular utilisation of instructional materials in teaching chemistry subject. It is always vital to use instructional materials well. This finding had a similar opinion with Bello (2012) that provision and utilisation of well-equipped physics laboratory was very important in creating positive perceptions in the subject and contributed to high standards of academic achievement. This encouraged this researcher to explore the influence linked to the instructional resource utilization on students' academic performance and more so in county secondary schools, using mixed methods in Makueni County.

The present development in technology has enabled the production of information and machines that reduce educators' communication during the process of teaching in class, learners' attention and understanding was retained and this enhanced the achievement of the learning objectives (Onasanya, et al. (2008). As reported by

Soetan et al. (2010), different visual representation of data are as follows including photographs, drawings, charts, geometric designs, sketches, posters, graphs, number symbols, cartoons, engineering drawings and maps. Graphics convey comprehensibly real information through pictures, drawings, and words. Utilisation of visual representation of data in instruction produces certainty to learning materials. They assist to envisage clear understanding of all the learning ideas and how they are connected to each other. According to Raw (2003) electronic media processing both sound and visual component aids are described as the instructional resources which facilitate the process of teaching and learning. It helps teachers minimize their classroom work and encourage students enjoy their learning by observing and doing hands-on activities. These teaching and learning resources such as graphs, posters, charts amidst many others, increase the rate of retention of the learning concepts.

Edokpolor (2019) did a study to find out the status of physical infrastructure availability and utilization of teaching and learning materials for the appropriateness in teaching and learning in Technical and Vocational Education and Training (TVET) curriculum. The study adopted quantitative research method. The sample size included seven hundred respondents; six hundred and fifteen students and eight five educators. The sample was randomly chosen in three Federal Universities in Nigerian South-South regions. Data collection tools were structured questionnaires. Descriptive statistics was employed to analyse the collected data. The study findings signified that school infrastructure were dilapidated and insufficient for instructional processes in TVET syllabus. Additionally, teaching and learning resources were established to be below the potential use throughout the instructional programmes.

Bukoye (2018) studied on usage of teaching and learning resources as equipment for attainment of better academic achievement of learners. The study was conducted by use of descriptive survey research design. The study respondents were one hundred students selected from 5 senior secondary schools. The tool employed for data gathering included self-designed questionnaires. Split-half method was used to determine the reliability level of study instruments where a correlation coefficient of 0.63 alpha level was achieved. The research findings showed that educators failed to appropriately utilise teaching and learning materials in majority of the learning institutions. Furthermore, the instructors who used them failed to use them effectively and contributed to high number of learners dropping in their academic achievement in external tests in all the subjects they studied. In line with the study results, the counsellors who are professionally trained in the country needed to refine all schools managers and educators by retraining them and providing workshops on the benefits of optimal utilisation of teaching and learning resources.

In accordance with Olokooba (2021) who did an investigation on appropriate teaching and learning materials in instruction in Higher Basic Studies dealing human relationships and the way the society works in Nigerian Kwara State. Descriptive survey research method was used to conduct the study. The study employed purposive sampling strategy to sample two hundred and thirty-five instructors who taught Social Studies. The data gathered were analysed by use of descriptive statistics such as standard deviation, averages and percentages. The study findings revealed that majority of the teaching and learning resources were accessible at various percentages. Educators who teach Social Studies made effective utilisation of a few of the instructional materials. Teachers' personal qualities influenced the

way they utilised the teaching and learning materials while teaching. Additionally, the findings also confirmed that, the school management should augment teachers self-confidence by supplying the needed teaching and learning materials required to attain the learning goals. Instructors need to be creative and imaginative so as to encourage learners to study hard and improve on their students' academic performance. This study by Olokooba (2021) was in disagreement with that of Bukoye (2018) that inappropriate utilisation of teaching and learning materials contributed to high number of learners dropping in their academic achievement in external tests in all the subjects they studied.

Tuimur (2015) on his study reported that majority of the instructors who teach Social Studies in primary Education never got a chance to attend a single seminar on teaching social studies subject. Further, none of them had attended a course to enlighten them on how to teach issues which emerge such as 'Conflict and Conflict Resolution' in the present primary programs. The instructors did not have enough instructional resources for appropriately teaching social studies subject. Lastly, the research concluded that teachers did not have enough timely preparation on teaching 'Conflict and Conflict Resolution' as well as their capabilities to prepare and utilise the required instructional resources. Additionally, the selected learning institutions lacked adequate instructional resources. The study confirmed that it was necessary for teachers who teach Social Studies to receive advanced training and be refined on the effective utilisation of teaching and learning resources for teaching 'Conflict and Conflict Resolution'.

As reported by Konyango (2011) on his research that, though the physics equipment was adequate, there was inappropriate utilization of physics materials. This led to

low academic performance of the students. This low academic achievement in the subject was linked to negative perceptions of the educators as well as the students. Additionally, some of the science apparatuses were poorly kept and made the teacher to choose to use explanations and illustrations on the chalkboard. This contributed to boredom and disinterest in achieving the physics concepts by the learners.

Numerous researches that have been conducted on different variables and in various regions and contrasting findings found out. Several literatures reviewed mostly in learning institutions are concerned on adequacy as well as availability and hence limited studies have been carried out on utilization of instructional materials especially in Makueni County. Furthermore, majority of the researches have been done using descriptive survey research design. This study was conducted by use of mixed methods approach. Therefore, this study was set to determine the utilization of instructional materials and students' performance in county secondary schools in Makueni County.

### **Students' academic performance**

Students' academic performance in the present study is the dependent variable. Academic performance is the quantification of student scores in different academic disciplines. Officials in education and educators in most cases compute attainment by making use of class achievement, results from standardized assessments and rates of graduation (Ballotpedia, 2023).

According to National Assessment of Educational Progress (NAEP) (2022), performance of student can be calculated by use of numerous standards such as school graduation rates, grade point average (GPA), yearly regulated assessments

and school entrance examinations. A student's GPA is usually quantified on the proportion of 0 to 4. Government and officials in schools associated to central government gathered data on graduation rates and used it as a standard scale of senior secondary schools achievement. Every region carried out yearly assessments at the levels of junior, middle and senior schools to established learner competency in field of modern English and arithmetic. These evaluations were as well employed to act in accordance with federal school level. Education zones as well trailed learner achievement on the ACT and SAT to establish the preparedness for senior schools (ACT, 2012 ACT National and State Scores, 2022).

As reported by Education Sector Diagnosis in UNESCO: IIEP (2010), there are several methods of determining the quality of the education outputs learners achieve in the main units of the education programs. Majority of the assessment conducted in primary schools paid emphasis on English skills and mathematics and in secondary schools, a lot of attention was on languages, arithmetic and science subjects. It is hard to discover researches on assessments on achievement of basic skills and skills based on socialization within the community. Currently, Education for All is concerned on attainment of learning goals i.e., cognitive achievement, whose key output indicators include the percent of candidates who have passed at national examinations, autonomy in learning and the mean scores learners achieve from standardized assessment examinations in various subjects.

Lamas (2015) has reported that students' academic performance is a measurement that helps to show whether an institution is achieving its mission or learning, evidenced by grades. These grade include, cognitive knowledge and skills learners achieved after internal or external examinations. Academic performance of students

is shown mostly by the grade achieved by learners after summative assessments, in this case Kenya Certificate of Secondary Education. Students' academic performance ensures attainment of learning (educational goals). The academic performance entails elements such as personality, the level of intellectual value, skills, study behaviors and self-respect. As Caballero et al. (2007) reports, academic performance entails achieving the objectives, accomplishments and goals planned in the syllabus that a learner accesses. These are shown by scores showing a pass or fail on the examined subjects.

Based on Reche et al, (2012) many examinations are conducted in the Kenyan education sector and passing of the examinations is a standard measure of good performance. Further, values achieved in learning such as high level of intellectual values, good grades, literary, cognitive abilities and transiting from one level to higher level of learning is a clear indication that educational resources are provided and quality education is achieved, the question remained; were these resources well utilised? However, it was hard to achieve quality education without effective use of quality education resources, which played a very vital part in achievement of goals of the schools.

## **2.6 Summary of the literature review and the gaps in the study**

Utilization of institutional resources is a subject of major concern in the education sector as majority of the researchers consider it to have great effect on academic performance. Despite escalation of enrolments after the inception of the FPE in 2003 and FDSE in 2008, the government, sponsors, well-wishers, donors and the community have contributed heavily towards adequate and suitable provision of school resources in order to accomplish quality performance and to ensure that

every child is learning despite coming from the very disadvantaged surrounding. Although, many researches have been done on utilization of institutional resources, great work has been done in other areas leaving Makueni County with little literature. This demands for an investigation in this region to quantify literature on utilization of institutional resources on academic performance of students.

The county of Makueni is among other counties with many public county secondary schools where few researches have been carried out to determine whether the availed school resources are optimally used and the quality of the grades achieved by students. Majority of the reviewed literature from all the areas around the globe, including Kenya, on utilization of institutional resources refer to middle colleges, higher institutions of learning, pre-schools and primary schools ignoring secondary schools and the reason as to why they have scanty literature. There are many researches done in different areas, however, they have contrasting findings, for example: Ehinola & Alabi (2012) conducted a study on school types, facilities and academic performance of students in Nigeria using descriptive survey research design and found out that physical and material resources were underutilized and contributed to poor students' performance, Cakir (2012) investigated on computer teacher's awareness of technological utilization using survey-based quantitative research design and revealed that technology-based resources were sufficient in schools, however, were not optimally used in classroom teaching, Usman (2016) did a study on Human resources in a health institution, adopting survey-based quantitative descriptive Survey method for the research and showed that HR practices were very Important as they provide vital services and contribute greatly on performance of health organizations and lastly, Nsa, Ikot & Udo (2013)

conducted a study on the use of instructional materials in Agriculture, using descriptive survey research design and alleged that significance difference existed between students' performance taught using instructional materials and those taught without the use of materials.

Whilst several of these studies have stipulated that a positive relationship existed between utilization of different institutional resources and academic performance of students, others registered that, though the physics equipment was adequate, there was inappropriate utilization of physics materials. This led to low academic performance of the students. Therefore, the government and stake holders in education are left without precise solution concerning the association between utilization of institutional resources and learners' academic performance. Thus, the present study attempted to fulfill the identified research gaps by investigating on utilization of most of the institutional resources and learners' academic performance using mixed methods research design in county secondary schools Makueni County.

Apart from conducting the study on utilization of institutional resources, there are many other institutional resources that influence learners' academic performance, among them the; entry behavior of learners, school environment and non-school factors. These variables were not investigated as the researcher was specific on utilization of institutional resources on students' academic performance in county secondary schools Makueni County.

## **CHAPTER THREE**

### **RESEARCH DESIGN AND METHODOLOGY**

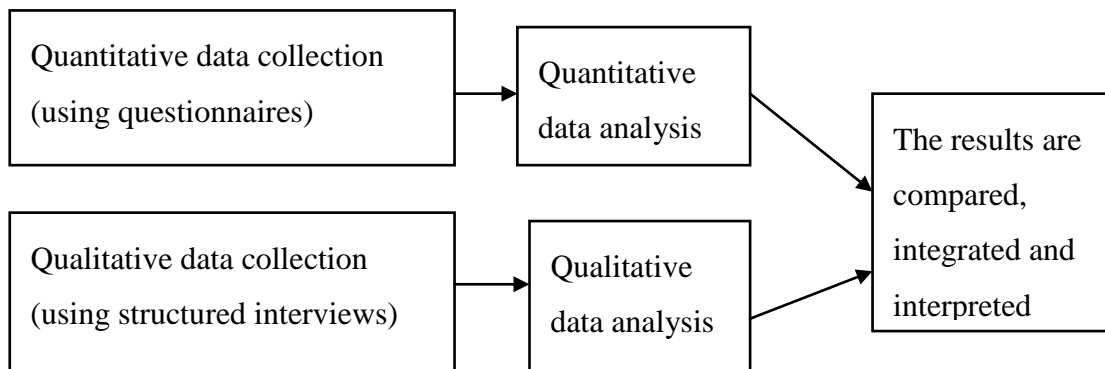
#### **3.1 Introduction**

This chapter focuses on research design, variables, study locale, target population, sample and sampling techniques, data collection instruments, piloting, validity, reliability, data collection techniques, methods of data analysis and logistical and ethical considerations.

#### **3.2 Research Design**

The study adopted mixed methods research design, specifically Convergent parallel research design (Creswell, Plano Clark, Guttman & Harrison, 2003, Tegan, 2021). Convergent parallel research design entails collecting and analyzing data using qualitative and quantitative techniques at the same time in one study and analysis done separately. The research results are then compared, integrated and interpreted so as to confirm and cross-validate findings within the study (Creswell, 2003). The purpose of using convergent parallel research design in the context of this study is, it yields distinct but complementary findings on that topic and gives a better understanding of solving the research problem. The main reason for using mixed methods research design was to corroborate and triangulate the study findings (Creswell & Clark, 2011, Tegan 2021).

### Convergent parallel research design



**Figure 3.1: Convergent parallel research design model.**

Source: Creswell, Plano Clark, Guttman & Harrison (2003), Creswell, & Plano Clark (2011) and Tegan, 2021).

Convergent parallel research design entails data collection and analysis being done concurrently using quantitative and qualitative methods in a single study, analysis is then done separately. The research results are compared, integrated and interpreted.

In this model quantitative data collection entails collecting data using ex-post facto research design. The ex-post facto research design is a type of quantitative research whereby the researcher predicts the likely cause of an event that has already occurred. In this case the researcher cannot manipulate that what has already happened. The researcher then goes on to collect data to find the likely cause between these factors and other attributes that follow closely (Wambugu, 2021).

Qualitative data collection allows collecting data using structured interviews. Quantitative data collection is the major method while qualitative method is the minor method, however, both methods helped to collect useful data. Quantitative data analysis was done using means, percentages, chi-square, multiple regression and qualitative data analysis done using thematic analysis. For thematic analysis, words, facts, verbatim and some narratives were transcribed so that they could be

analysed. This method is suitable to this study because it enabled the research results to be compared, integrated, interpreted and then triangulated. The research findings were then confirmed, cross-validated and corroborated to be able to answer the research question. This study is based on post-modernism and positivism philosophy which is mostly used for mixed method research designs. This philosophy is based on inductive and deductive reasoning. They recognize only that which can be scientifically verified or capable of logical or mathematical proof. It also upholds the primacy sense of experience and empirical evidence as the basis for knowledge and research. It grounds upon hard and definite foundation of empirical testable data and makes theories from out of this data. It is characterized by science being the only source of valid knowledge, subjectivism, skepticism and that truth changes with appearance of new events and discoveries.

### **3.2.1 Study Variables**

#### **3.2.1.1 Independent Variables**

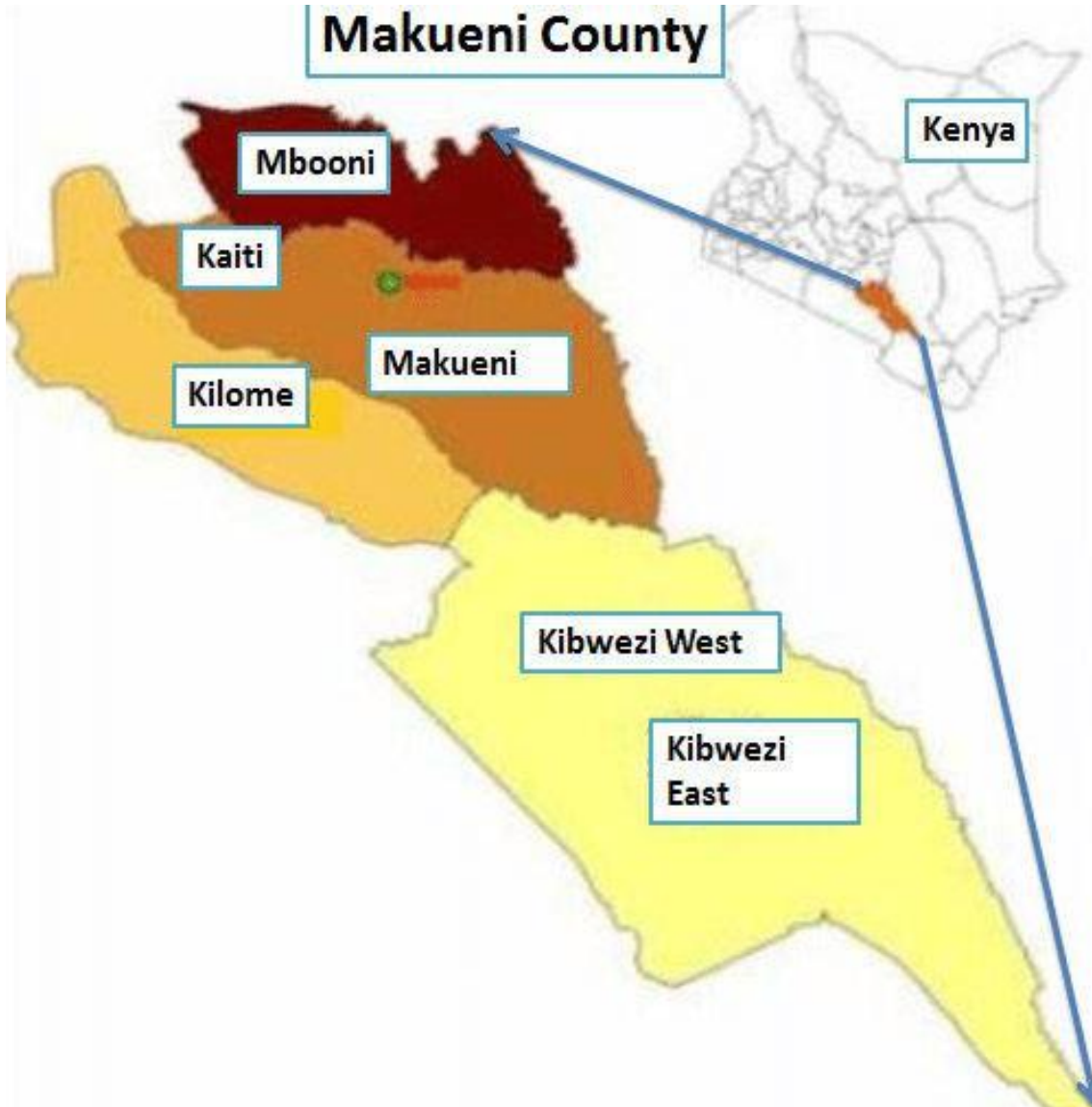
The independent variables are utilisation of institutional resources. The specific aspects of the independent variable included: to determine utilisation of textbooks, to establish utilisation of school infrastructure, to determine utilisation of teacher resources and lastly to establish utilisation of instructional materials.

#### **3.2.1.2 Dependent Variables**

The dependent variable is students' academic performance, specifically the in Kenya Certificate of Secondary Education (KCSE) results.

### 3.3 Study Locale

The research is conducted in Makueni County. Makueni County is (formerly Makueni District) It is a county in the former Eastern Province of Kenya. The headquarters is Wote. The county has a population of 987,653 (2019 census) and an area of 8,008.9 km<sup>2</sup>. The county has nine sub-counties: Makueni, Kilungu, Kibwezi, Nzau, Makindu Sub-County, Mukaa, Mbooni-East, Mbooni West, and Kathonzweni Sub-County. Urbanization in Makueni County is 11.8 %, poverty level is 64.1 %. (Wikipedia, 2020). County secondary schools are 60 (according to Makueni county education office, 2020), which are the focus of the study. National and extra county secondary schools in Makueni County have been performing exceptionally well nationally in Kenya Certificate of Secondary Education, (8.275, B) and (7.538, C+) K.C.S.E school means and grade being achieved in these schools respectively. However, dire performance has been attained in the county schools (a mean score of 4.691, D, (*refer table 1.2*)). Furthermore, there was ease of accessibility of data in Makueni County that helped to reduce the cost and time of the research as it neighbors my home county i.e., Machakos. Lastly the researcher has passion and interest professionally and personally for the county besides there is relationship between subsequent development in career map and prospective contribution to the attainment of career goals. These were the main reasons as to why the county was considered for the study. Figure 3.2 below represents the map of Makueni County.



**Figure 3.2: Map of Makueni County.**

Source: *GoK (2022) Kenya County Fact Sheet.*

### **3.4 Target Population**

The target population was all the public county secondary schools in Makueni County. The total number is 60. Teachers were 1004 and 60 principals. Mugenda and Mugenda (2003) reported that the whole group from where a sample is selected in research is supposed to have known properties that can be generalized to all the other related populations.

### **3.5 Sampling Techniques**

The study employed four different kinds of sampling methods to get the unit sample size of the learning institutions and sample size of the study subjects. The sampling methods that were employed in this research included, simple random sampling and stratified sampling methods were used to select the schools, systematic random sampling technique was used to choose the instructors and lastly purposive sampling technique was employed to sample the principals for the interview and HoDs for document analysis.

#### **3.5.1 Sampling of the County Secondary Schools**

County schools from the nine sub-counties were carefully chosen by use of simple random sampling method. A sample of 30 county secondary schools was selected, this gave equal representation from each sub-county. Mugenda (2008) posited that 50 per cent of the target population was enough sample size which represented the population. Stratified Sampling technique was used to sample the county secondary schools. This is a probability sampling method where members from the population are grouped into different strata from which the schools were randomly sampled. The strata were boys boarding, girls boarding and mixed secondary schools. The main reason for using this method is it ensured the sample was well represented from each stratum for the purpose of generalization (Taherdoost, 2016).

### 3.5.2 Sample Size

**Table 3.1: Sampled public county secondary schools per sub-county.**

Sub-county	Target population of county secondary schools	Sample unit size of the schools
Makueni	8	4
Kilungu	4	2
Mukaa	6	3
Nzaui	4	2
Mbooni-East	8	4
Mbooni-West	8	4
Kathonzweni	8	4
Kibwezi	6	3
Makindu	8	4
<b>Total</b>	<b>60</b>	<b>30</b>

Source: Makueni County Education office (2020).

**Table 3.2: Sampled County secondary schools**

Category	Target population	Sample	Percentage
Boys boarding county secondary school	12	6	50
Girls boarding county secondary school	22	11	50
Mixed boarding county secondary school	26	13	50
<b>Total</b>	<b>60</b>	<b>30</b>	<b>50</b>

Source: Makueni County Education Office (2020).

The table above shows the sample size and the percentages of county secondary schools in Makueni County.

### 3.5.3 Sampling of Teachers and the Sample Size

Sampling of teachers was done by use of systematic random sampling technique. 15 teachers, who some, where Heads of Departments and others who teach form fours were chosen from each sampled public county secondary school. In accordance with Yamane (1967), there are many approaches to establish the sample size. They are as follows; imitate a sample size of related researches, use of census for a small-scale population, use of tables which are published and then compute a sample size. The researcher used the Yamane (1967) to determine teachers sample size and then used systematic random sampling technique to selected teachers who are heads of departments and others teaching form four students. In using Yamane, 95% confidence level and the assumed p-value for the equation is 0.05. The sampled number of teachers was 286 of sampled schools.

Teachers sample size using Yamane formula

$$n = \frac{N}{1 + N(e)^2} = \frac{1004}{1+1004(0.05)^2} = 286$$

P = .05 are assumed for the equation.

N=1004

e = level of precision

N = population size

Where n = sample size

**286** respondents

### 3.5.4 Sampling of Principals and the Sample Size

Sampling of principals was done by purposive sampling method. Principals were purposely selected as the only persons who had administrative and managerial skills,

besides having characteristics of interest for the study. The principals had a lot of information on institutional resource utilization on students' academic performance in public secondary schools and gave the required information for the study.

**Table 3.3: Sampled respondents**

<b>No.</b>	<b>Category</b>	<b>Target Population</b>	<b>Sampled Population</b>	<b>Percentage</b>
1	Principals	60	30	50
2	Teachers/ HoDs	1004	286	28.5
	<b>Total</b>	<b>1064</b>	<b>316</b>	<b>29.7</b>

Source: Instruments.

The table 3.3 above shows the sampled respondents in county secondary schools in Makueni County. The total sample size was 316 respondents.

### **3.6 Research Instruments**

The study used questionnaires, interview schedule and document analysis to collect data: -

#### **3.6.1 Questionnaires**

McMillan and Schumacher (2006), postulated that a questionnaire is a tool designed for gathering large amount of data from study subjects through survey and has a greater anonymity in their answers and therefore helps to decrease interviewer bias. The questionnaires were made up of closed and open ended and structured elements on utilisation of institutional resources i.e., utilisation of textbooks, utilisation of school infrastructure, utilisation of teachers and lastly utilisation of instructional materials which were prepared by the researcher. The questionnaires were given to teachers.

### **3.6.1.1 Questionnaire for Teachers**

Teachers' questionnaires (*Appendix 1*) were used to collect on general information, data on utilisation of institutional resources i.e., utilisation of textbooks, utilisation of school infrastructure, utilisation of teachers and lastly utilisation of instructional materials, how they were utilised and when they covered the syllabus.

### **3.6.2 Interview Schedule**

Structured interview (*Appendix 2*) was used to collect data from principals on utilisation of institutional resources i.e., utilisation of textbooks, utilisation of school infrastructure, utilisation of teachers and lastly utilisation of instructional materials, how and when teachers completed the syllabus.

#### **3.6.2.1 Interview Schedule for Principals**

The interview schedule for principals collected data on how the effectively teacher resources teach, how they supervised them, monitored school operations and managed the use of all the institutional resources. They also talked about measures to timely cover the syllabus and on how to improve the students' academic grades.

#### **3.6.2.2 Document Analysis**

Document analysis (*Appendix3*) is a qualitative research method made use by many people who do research and it entails assessing both digital as well as physical records and explain them to comprehend the idea and expand on the provided information. Document analysis gathered information from school documents, such as number of school buildings, KNEC examination results, record of learners and teachers from the heads of departments. Document analysis is beneficial as it gives researchers permission to tell a complete story of their resources and choose the right research. Document analysis was given to Heads of Departments.

In triangulation, researchers always utilise information found through document analysis process where researchers make a contrast between two or many data sources of similar classification to decide on their likeness and contrasts. This process plays a key part in determining trustworthiness. Document analysis can again be used as a section of mixed-method researches that integrate both quantitative and qualitative information to generate a greater harmonious association that leads to better meaningful use of the data.

Document analysis is conducted by using the following steps;

- (a) Record the resources needed. For instance, records like list of teachers, K.C.S.E results etc.
- (b) Firm decision should be made on how to put in order the data.
- (c) Several reprints should be made for records.
- (d) Originality should be guaranteed.
- (e) Examine if there is unfairness
- (f) Inquire if there are questions.
- (g) Assess the official.

### **3.7 Piloting of the study instruments**

According to Wiersma (2000) piloting is conducted to detect unambiguousness and incorrect wording in sentences in the study instruments. The main aim of piloting is to identify problems that can be corrected before the actual study, so that respondents can give accurate response (Faranenkel and Wallen, 2000). Thus, piloting makes research instruments understandable, straightforward and user-friendly for the respondents.

Piloting was done in three public county secondary schools; this was five percent of the sample. According to Mugenda & Mugenda (2003) the number of respondents in the pretest should not be excessively large, this should range from one percent and ten percent according to the sample size. The choice of pilot schools was done by first knowing all sampled schools, then chose those schools within the locale. The schools included in piloting were not be included in the main study. Teachers and students selected for piloting were chosen by systematic random sampling method while the principals were purposely selected.

The main outcome of pre-testing was, some wording used in the questionnaires and interview schedule for teachers, students and the principals respectively, which were not relevant were replaced with those which were vivid. Simple language was used, the number of the questions was increased to cater for every data that was needed and ambiguous questions completely removed. Content validity was made stronger by expert judgment, who assisted in writing the right grammar and proper arrangement of wording in sentences especially with qualitative data, any other needful rectifications were done with high accuracy (Ogal, 2015).

### **3.7.1 Validity**

Validity is the level at which a research technique really assessed what it made to ascertain; it measures accuracy of the results (Middleton, 2019). The researcher designed some instruments which were used to collect data. A few copies of the instruments were handed over to three panel of professional experts from the department of educational management, policy and Curriculum Development which are Dr. Guantai. Dr. Ogeta and Dr. Ogolla. They went through them to ascertain content, construct and face validity, words used and relevance to the objectives. A

checklist was prepared by the professional experts to validate the instruments using a three Likert-scale stating the level of relevancy. 1-Extremely relevant, 2- relevant, 3-not relevant at all. Content Validity Index (CVI) was calculated from what was responded.

$$\text{CVI} = \frac{\text{Total number of items rated relevant}}{\text{Total number of items}}$$

$$\text{CVI} = 30/37 = 0.81$$

The CVI results .81 means that these research instruments were valid enough to enable the researcher to do the study.

Researchers such as (Jingcheng, Xiankun & Zhenqiu 2012) reported that a scale of 0.78 or greater is a standard content validity. This depends on the qualities and expertise of the experts and the validation process.

Therefore, research instruments which were not relevant at all were removed, others were corrected and modified with consultation and discussion with the content experts and professional specialists. Content, construct and face validity was then achieved with the help of expert judgment. For example, dichotomous questions which had yes or no answers were rectified and improved and made clearly understood. Some of the wordings were replaced with those which were clearly understood. This enriched and fine-tuned the constructed instruments according to the variables and objectives of the study (Benini et al, 2017).

### 3.7.2 Reliability

Test-retest technique was used to test reliability. This technique checked the consistency of tests after a certain time, across different observers and across parts of the test itself (Hobbs, 2016). When quantitative research is done, the reliability and validity of your research methods and instruments of measurement have been considered. It tells how consistent a method measure something. When the same method is applied to the same sample under the same conditions, the same results should be attained. If not, the method of measurement may be unreliable.

Test-retest technique was used to test reliability of this study. It was useful to use it in this study because it measured accurate representation of the performance and ascertained stability over time and the results obtained in the two tests were due to the intervention. Test-retest reliability was done by administering a test on the principals, teachers and the students at one time and repeating the same test on the same sample after four weeks. The scores for the two tests, test 1 and test 2, were obtained and correlated to compute Pearson correlation coefficient, ( $r_{xy}$ ), using the formulae below

Where:

- N = number of pairs of scores.
- $\Sigma x^2$  = sum of squared x scores
- $\Sigma y^2$  = sum of squared y scores
- $\Sigma xy$  = sum of the products of paired scores.
- $\Sigma x$  = sum of x scores
- $\Sigma y$  = sum of y scores

The reliability index of 0.96 obtained indicates high degree of correlation as Mugenda (2008) stated that a reliability index of a minimum of values of 0.8 or more indicates high degree of correlation and can be used to judge the research instrument as reliable or consistent (Orodho, 2009), (Glen, 2016).

### 3.7.3 Reliability Test of the Instruments

This study chose to consider approximating reliability by use of the Cronbach's alpha to measure internal consistency. Internal consistency is a used to gauge consistency in the research tools and how best the items measure specific qualities in the test. Orodho (2009), stress that the most known technique of measuring internal consistency is Coefficient alpha. However, Cronbach's alpha coefficient test was employed to measure the internal consistency of the research items. Reliability is the measure of internal consistency of the constructs in the study. A construct is reliable if the Alpha ( $\alpha$ ) value is greater than 0.70 (Hair, 2013). To check whether the Likert scale used in the questionnaires was reliable in this study, the Cronbach's Alpha test of reliability was done and results presented in table 3.6 below.

**Table 3.4: Reliability Test**

<b>Constructs</b>	<b>No. of Items</b>	<b>Alpha (<math>\alpha</math>)</b>
Utilization of textbooks	13	0.858
Utilization of school infrastructure	14	0.705
Utilization of teacher resources	10	0.834
Utilization of instructional resources	23	0.917

Source: Instruments.

The results from table 3.6 revealed that utilisation of textbooks scale with 13 items ( $\alpha=0.858$ , utilization of school infrastructure scale with 14 items ( $\alpha=0.705$ ),

Utilization of teacher resources scale with 10 items ( $\alpha=0.834$ ) and utilization of instructional resources scale with 23 items ( $\alpha=0.917$ ) were found to be reliable.

### **3.8 Data Collection Procedures**

Immediately after the research proposal was approved by the Graduate School of Kenyatta University, the process of collecting data began. The researcher was issued with a letter of research authorization and a letter of introduction by the board of post graduate studies from Kenyatta University giving the researcher authority to move forward with data collection. The letters of research authorization and that of introduction from the Graduate School allowed the researcher to apply for a research permit from the National Council for Science, Technology and Innovation (NACOSTI), which was received after a short while. The researcher then proceeded on to the office of the County Commissioner and that of the County Director of education in Makueni County and told the of the move to carry out a study in the county. The County Commissioner and the County Director of Education gave me an authoritarian permit to visit the county secondary schools and collect data. Plans were made on when to visit the schools, do introduction and prepare for commencement of data collection. All the respondents sampled in accordance with the sampling methods employed. Once in the sampled schools, the respondents were requested to fill the consent form as an acceptance to take part in the study. The researcher gave an assurance to the respondents that the study was purely academic and that their anonymity and confidentiality was highly maintained. As maintained by Creswell (2012), the researcher established high quality methods of collecting data. Data collection was conducted in ethical ways to the individuals and to the research sites

The researcher then distributed the research instruments to the schools and made proper arrangements with the principals, teachers and students on when the questionnaires would be filled and how and when the interviews would be administered. The researcher made arrangements with respective schools to collect the filled questionnaires making sure all questions were well filled. Administering the interview with the principals was also done and the completed instruments were then collected and dispatched for analysis. These instruments were taken to a central office where cross-checking them and coding started immediately. Mugenda & Mugenda (2003) reported that it was very necessary to make sure that the instruments were effectively completed. They continued to reveal that data coding and entry into the computer started as soon as completed instruments were collected which was done as expected. Immediately the data was transferred from the instruments to the computer, the instruments were then kept in a safe place for future reference.

### **3.9 Data Analysis**

Data analysis is the process of putting facts and figures together in order to make sense out of them and find vital information which would enable the researcher to respond to the research question (Mugenda and Mugenda, 2008). Data analysis was done based on the objectives of the study as listed below: to determine the utilisation of textbooks and its influence on students' academic performance in public secondary schools in Makueni County, to establish the utilisation of school infrastructure and its influence on students' academic performance in public secondary schools in Makueni County, to determine the influence of utilisation of teacher resources and students' academic performance in public secondary schools

in Makueni County. And lastly to determine the influence of utilisation of instructional materials and students' academic performance in public secondary schools in Makueni County.

### **3.9.1 Quantitative Analysis**

Quantitative data was conducted by use of both descriptive statistics and inferential statistics on the five-point Likert scale, using SPSS version 26. Information was applied to show the degree of the influence of utilisation of institutional resources and students' academic performance. Descriptive statistics applied included means, percentages and standard deviation. Means, which were calculated in par with Lee (1999) as indicated in Bademo and Tafera (2016) revealed that a mean less than 2.00 is considered to be low, a mean ranging from 2 to 3.9 is moderate and a mean from 4.0 to 5 is high.

Inferential statistics such as multiple linear regression was used and indicated the extent to which utilisation of institutional resources influenced students' academic performance. Multiple linear regression is a statistic used when one wanted to predict how the value of dependent variable was influenced by several independent variables (Teeboom, 2019).

### **3.9.2 Normality Test**

Normality test was performed on the data to determine whether parametric tests such as correlation and regression were appropriate. Shapiro-Wilk test was used to test the normality of the scores collected and the results presented on table 3.7 below.

**Table 3.5: Normality Test**

	Shapiro-Wilk		
	Statistic	df	Sig.
Student academic performance	.897	220	.055

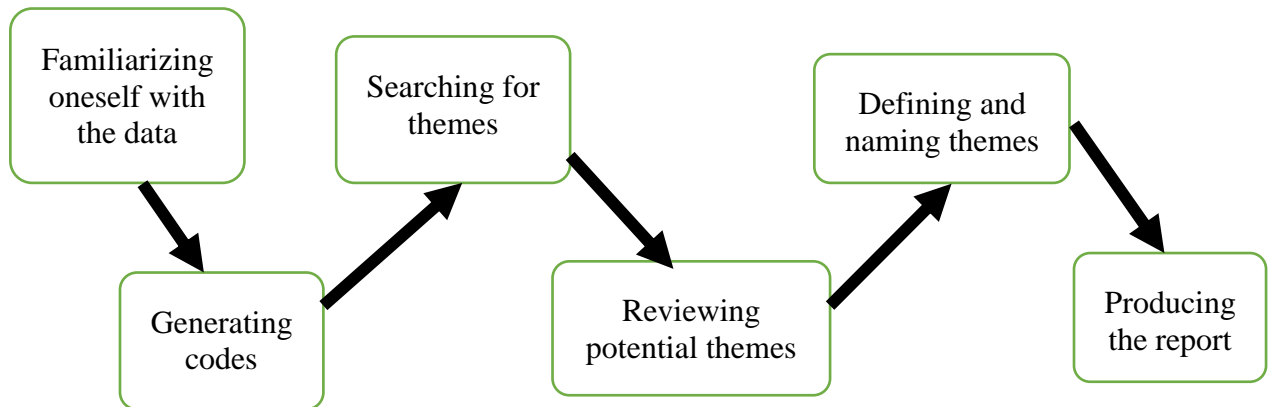
Source: Instruments

The null hypothesis behind the normality test stated that; students' academic performance is normally distributed against the alternative hypothesis that it was not normally distributed. Shapiro-Wilk test would be of use for samples less than 2000 (Garson, 2012). The findings from Shapiro-Wilk test indicated a  $p=0.155 > 0.05$ . Therefore, the study failed to reject the null hypothesis and concluded that the students' academic performance data assumes normal distribution

### **3.9.3 Qualitative Analysis**

Qualitative data analysis was done by use of thematic analysis which is a way of examining in detail and interpreting qualitative data. This method is relevant when the data collected is in form of interviews, texts, stories, transcripts or recordings. These data are inspected in detail by the researcher to establish usual occurring ideas, themes, topics and meaningful patterns that appear over and over again.

The following is a six-step process approach of organizing and carrying out thematic analysis; familiarization, coding, generating themes, reviewing themes, defining and naming themes and writing up, although it has different adaptable methods (Braun & Clarke, 2006), which is illustrated on the figure below.



**Figure 3.3: Six-step process of thematic analysis**

Source: Caulfield (2019).

### **Step 1: Familiarization**

This step entails knowing all data. The researcher needs to read through all the noted down or recorded audios and know each and every item collected, understand it and be familiar with it before the data is analysed. This may be done by arranging speech, stories, thoughts or data into written form and reading it over and over to know it well.

### **Step 2: Generating Codes**

According to Bodine (2021). Coding of data is the process of transforming data into a certain form for easy analysis. It entails giving codes to data such as numbers or certain groups, for instance answers to from surveys or bio data. There are several statistical software and other instruments that can analyze that coded data. Coding the data also refers to assigning some codes by marking sections or sentences and phrases that give a detailed account in the words within the text. In analysis of data, coding is a key part because it gives researchers knowledge to understand huge volumes of data and make significant judgment. When codes are allocated to data,

researchers can easily recognize patterns that were in other ways hard to identify. (Quality Gurus, 2023).

The following steps are used during the process of data coding:

- i. Going through or paying attention to all the data and spotting the clauses that are general, ideas or categories that appear.
- ii. The qualitative data is divided into smaller samples.
- iii. Use the most appropriate wording to form codes that cover the whole sample.
- iv. Reading severally the sample and applying the codes, then put the data that had been coded into data grid code.
- v. Going through a new data sample, using the codes formed which are arranged alphabetically in the computer to be analysed for the first sample and choosing issues to analyse in connection to study context (Bodine, 2021).

### **Step 3: Searching for themes**

As it is ascertained by Braun & Clarke, (2006) that after codes have been created, patterns are established among them and by looking repeatedly over the codes, the researcher begins creating the themes. Normally, themes are more comprehensive than codes and many patterns make a theme.

### **Step 4: Reviewing themes**

The researcher should make sure that the themes finally got can help achieve something and correctly represent the whole data. The researcher has to go back to the data and make comparison for any important information missing which should be incorporated. If there is need to change the terminologies, then it is done with a lot of carefulness. It is necessary to combine themes or create new ones to make them more useful and accurate.

### **Step 5: Defining and naming themes**

After getting the last list of themes, they should be named and defined. To define themes refers to drawing up what they mean and make out how it would help to understand the data. This helps to make themes brief and easily understandable (Braun & Clarke, 2006).

### **Step 6: Writing up**

The last step is to write up the data analysis. There should be an introduction to formulate the approach, aims and the research question. Methodology on how the data was collected should also be included and how thematic analysis was done. The findings should well be brought out and how the themes came-up and their meanings. Lastly, the conclusion explaining how the analysis has helped to answer the research question. A report is then written-up (Castleberry & Nolen, 2018).

Thematic analysis is the best qualitative analysis methods as it helped to show the degree to which the utilisation of institutional resources influenced students' academic performance.

The four hypotheses were tested using the Chi-square ( $\chi^2$ ) test, at 0.05 level of significance and at 1 degree of freedom. If the p-values are smaller than 0.05 significance level the null hypothesis was rejected, as opposed to, if the p-value was greater than 0.05 level of significance, then the researcher fails to reject the null hypothesis.

**Table 3.6: Data Analysis plan**

<b>Objective</b>	<b>Nature of data</b>	<b>Statistical tool</b>	<b>Mode of presentation</b>
1. To determine the level of utilisation of textbooks and its influence on students' academic performance in public county secondary schools	Quantitative Qualitative	Inferential statistics Multiple regression, Thematic analysis	Tables graphs verbatim
2. To establish the level of utilisation of school infrastructure and its influence on students' academic performance in public county secondary schools	Quantitative Qualitative	Inferential statistics Multiple regression, Thematic analysis	Tables graphs Verbatim
3. To determine the level of utilisation of teacher resources and its influence on students' academic performance in public county secondary schools	Quantitative Qualitative	Inferential statistics Multiple regression, Thematic analysis	Tables graphs verbatim
4. To determine the level of utilisation of instructional materials and its influence on students' academic performance in public county secondary schools	Quantitative Qualitative	Inferential statistics Multiple regression Thematic analysis	Tables graphs recordings

Source: Instruments.

### **3.10 Logistical and Ethical Research Issues**

For a successful completion of the research, the researcher examined and addressed the following processes, activities and actions. The researcher obtained the appropriate authorization documents and arrangement to proceed to the field to gather data began. All the tested research instruments were prepared and the researcher ensured that they were adequate. Funds for use during data gathering was sought for and arrangement for time and dates to travel to the sampled schools made. Frequent conversation and confirmation between the researcher, principals and teachers were in place on the exact day and time for data collection. At the same time, the researcher received the mandatory COVID-19 jab which allowed her entry and association to the respective sampled learning institutions.

The researcher then travelled to the respective sampled schools to liaise with the school managers on the arranged plan to collect data. The researcher visited different schools according to the arranged dates and time paying attention to the laid down sampling methods and created rapport with the respondents. Besides, the researcher gave assurance to the respondents on anonymity and confidentiality of the collected data and informed them that the research was purely academic. The respondents were advised not to note down their names on the research tools. They were issued with research consent form to seek voluntariness and informed consent and ascertained that they had accepted to take part in the study. The researcher also organised with the purposively sampled principals on the specific times to conduct the interviews. The interviews were administered as planned ensuring them of high confidentiality. Adequate resources ensured adequate and appropriate data collection. (Mugenda & Mugenda, 2003).

## **CHAPTER FOUR**

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

#### **4.1 Introduction**

This chapter presents the findings, interpretations and discussions of the study, which are arranged according to objectives and research hypotheses of the study. The study investigated the influence of institutional resource utilisation on academic performance in public secondary schools in Makueni County. The study sample consisted of thirty (30) school principals, two hundred and eighty-six (286) teachers from thirty (30) secondary schools in the County. Data were collected using questionnaires and interview schedules. The collected data were analysed by both descriptive and inferential statistics, then the results presented in graphs or tables. This was organized according to the objectives.

Demographic information was captured from the principals and teachers on gender, age bracket, highest level of education and years in teaching experience.

Apart from the demographic information, information on the objectives was collected and analysed as this was important to fulfil the purpose of conducting this study.

##### **4.1.1 Research Objectives**

1. To determine the level of utilisation of textbooks and its influence on students' academic performance in public secondary schools in Makueni County
2. To establish the level of utilisation of school infrastructure and its influence on students' academic performance in public secondary schools in Makueni County.

3. To determine the level of utilisation of teacher resources and its influence on students' academic performance in public secondary schools in Makueni County.
4. To determine the level of utilisation of instructional materials and its influence on students' academic performance in public secondary schools in Makueni County.

#### **4.1.2 Research Hypotheses**

H<sub>0</sub>1. Utilisation of textbooks has no significant influence on students' academic performance in county Secondary schools in Makueni County.

H<sub>0</sub>2. Utilisation of school infrastructure has no significant influence on students' academic performance in county secondary schools in Makueni County.

H<sub>0</sub>3. Utilisation of teacher resources has no significant influence on students' academic performance in County secondary schools in Makueni County.

H<sub>0</sub>4. Utilisation of instructional materials has no significant influence on students' academic Performance in county secondary schools in Makueni County.

The analysis was based on the following themes which were generated from the objectives.

- a) Utilisation of textbooks and its influence of on students' academic performance
- b) Utilisation of school infrastructure and its influence on students' academic performance.
- c) Utilisation of teacher resources and its influence on students' academic performance

d) Utilisation of instructional materials and its influence on students' academic performance.

#### 4.2 Response Rate

The study investigated the influence of selected institutional resource utilisation on academic performance in public secondary schools in Makueni County. The study sample size consisted of thirty (30) school principals, two hundred and fifty (286) teachers from thirty (30) secondary schools in the County. The table below presents the response rate of the instruments.

**Table 4.1: Research instruments response rate**

<b>Research instrument</b>	<b>Anticipated</b>	<b>collected</b>	<b>Percent</b>	<b>Unreturned</b>	<b>Percent</b>
Principals interview	30	26	86.7	4	13.3
Teachers questionnaires	286	220	76.9	66	23.1
Total	316	246	77.8	70	22.2

Source: Instruments.

Table 4.1 above shows that (26) school principals were interviewed and returned at 86.7 percent, Teachers filled the questionnaires and only 220 were returned at 76.9 percent. Total response rate expected was 246 instruments, however, only 246 instruments were collected which forms 77.8 percent. Mugenda and Mugenda (2008) ascertains that 50 per cent response rate is sufficient, 60 per cent fine and above 70 per cent admirable. The total response rate of 77.8 percent is termed adequate to make up study interpretations, since it is above the threshold suggested by (Mugenda and Mugenda, 2008).

### 4.3 General and Demographic Information

The study sought to establish the demographic information of the principals and teachers. The following information was sought; their age, the education level, the teaching experience, the number of years in the current station school.

#### 4.3.1 Population by Gender

The study sought to establish the gender of principals and teachers. The results are presented in table below.

**Table 4.2: Gender of the respondents**

<b>Respondents</b>	<b>Number</b>	<b>Percent per group</b>
Male Principals	16	61.5
Female Principals	10	38.5
Male Teachers	120	54.5
Female Teachers	100	45.5
<b>Total</b>	<b>246</b>	

Source: Instruments

Table 4.2 above shows percentage of gender of principals and teachers. For principals, males had a percent of (61.5%, N=16) and females (38.5%, N=10). All the boys' schools and mixed secondary schools were headed by male principals and this explains the gender imbalance from the principals. For teachers, there were more male respondents (54.5%, N=120) than females who were (45.5%,N=100).The interpretation is the number of male teachers deployed in public county secondary schools in Makueni County is more than the number of female teachers. According to the data from ILO-Gallup survey (2016) worldwide, females are considerably having a lower probability of having jobs in the labour market than their male counterparts, and also, their ability to obtain jobs of high standard is limited. Ministry of Education (2019) Basic Education statistical booklet reveals that

the number of female teachers were 37.5% among the employed population of all teachers (GoK, 2019 p. 15).

### 4.3.2 Age Distribution of the Respondents

The study sought to establish the age distribution of principals and teachers and the findings are presented in the table below.

**Table 4.3: Age distribution of principals and teachers**

Age bracket	Principals	Percent	Teachers	Percent
16 to 18	0	0	0	0
Over 19	0	0	0	0
Under 30	0	0	11	5
31 to 35	0	0	151	68.6
36 to 40	0	0	18	8.2
40 to 45	2	7.7	13	5.9
46 to 50	2	7.7	20	9.1
51 to 55	12	46.2	2	0.9
56 to 60	10	38.5	5	2.3
<b>Totals</b>	<b>26</b>	<b>100</b>	<b>220</b>	<b>100</b>

Source: Instruments.

Table 4.3 above shows the principals (7.7%, N=2) were aged between 46 to 50 years and 12 of them, which is 46.2% were aged between 51 to 55 years. The mean age of the principals stood at 53 years. Most of the principals were mature enough and experienced on their administrative duties and could ensure effective utilisation of the institutional resources. Many teachers were aged below 31-35 years (68.8% N=151). So as per the modal age, most of them were recently employed and had gained little experience on utilisation of the institutional resources, considering that teachers are not usually employed immediately after graduation. This could influence students' academic performance negatively. This finding agrees with Akiri

(2013) that teachers who are less experienced, have inadequate knowledge and skills and are usually less effective when compared to those who are more experienced. Usman (2016) agreed that the quality, quantity and effective operations of teacher resources should be put into consideration if desired students' academic performance was expected and that his study was connected to these findings.

### 4.3.3 Levels of Education of the Principals and Teachers

The study sought to determine the levels of education of the principals and teachers in secondary schools in Makueni County and the results are shown in table 4.4 below.

**Table 4.4: Levels of Education of the principals and teachers**

<b>Education Level</b>	<b>Principals</b>	<b>Percent</b>	<b>Teachers</b>	<b>Percent</b>
Diploma	0	0	28	12.7
PG Diploma	1	3.8	17	7.7
Bachelor's Degree	20	76.9	154	70
Masters	4	15.4	11	5
PhD	1	3.8	9	4.1

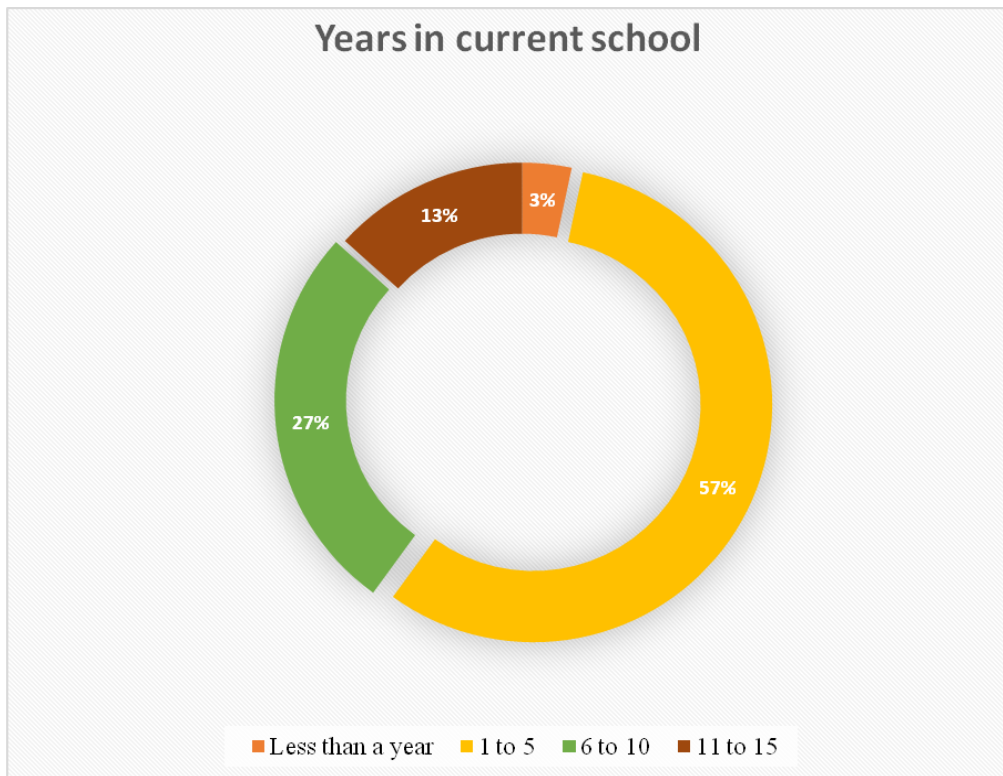
Source: Instruments.

Table 4.4 above shows that 20 school principals, (76.9%) had Bachelor's degree and (3.8%, N=1), had post graduate diploma in education and none had a diploma, 15.4%, N=4, had masters degrees, and lastly 3.8%, N=1, had achieved a PhD degree. This could be due to current TSC's minimum requirement for a secondary school principal. This information was prostrated on TSC employment requirements 2021/2022 policy document. Majority of the teachers (70%, N=154), had attained Bachelor's degree as the highest level of education (12.7%, N=28), had diploma in education, (7.7%, N=17), of them had post graduate diploma, (5%, N=11) had master's degree in education and (4.1%, 9) had PhD degrees. This implies that all

principals and teachers have sufficient knowledge and skills to teach effectively and use the needed school resources appropriately to influence students' academic achievement positively. The Basic education statistical Booklet reported that 68% of high school teachers had bachelors' degree and 8% of them were employed by BoM to curb shortage of teachers (Kahiti, Otieno & Adero, 2016, p. 16), also at the secondary school level, 89.48 % of the teachers were employed by the government (Basic educational statistical booklet, 2019 p. 32). These findings agree with a study done by Ndugu (2014) that teachers' performance was greatly determined by their qualifications, motivation, attitude, and the education facilities as well as staff professional development programmes. This finding by Ndugu (2014) also agreed with Njuguna (2018) that effective utilization of instructional materials not only require a lot of creativity but also knowledge of the content. Majority of the principals and teachers had the minimum requirement needed by their employer and this would explain why they should be very effective in using the institutional resources which should also translate into improved academic performance.

#### 4.3.4 Principals Years in the Current School

This study sought to establish the number of years principals had stayed in same teaching station. The findings were presented on the figure below.



**Figure 4.1: Principal years in current stations**

Source: Instruments.

Figure 4.1 above shows that most of the school principals (57%, N=17) and N=8, 27% had stayed in their current station between 1 to 10 years. This indicates that they had stayed long enough and had gained a lot of experience on the best ways to effectively use of the resources in their schools. These findings coincide with Egwu (2016) that the manager of a school ensures coordination and supervision of all school matters, so that everything runs smoothly. Strategies are made, duties delegated to all the teacher resources, work standards set and maintained to ensure

resources in the school are effectively used through embracing management ideas for the schools to realize the set goals.

#### 4.3.5 The Principal and Teachers Teaching Experience

The study sought to establish the principals and teachers teaching experience. The findings are presented on the table below.

**Table 4.5: The principals and teachers experiences**

Teaching Experience	Principals	Percent	Teachers	Percent
Below 5	0	0.0	35	15.9
6 to 10	0	0.0	104	47.3
11 to 15	0	0.0	28	12.7
16 to 20	2	7.7	17	7.7
21 to 25	9	34.6	12	5.5
26 to 30	13	50.0	16	7.3
31 to 35	2	7.7	8	3.6
<b>Total</b>	26	100	220	100

Source: Instruments.

From table 4.5 above shows 13 of the principals, (50%) had an experience that varied from 26 to 30 years. Majority of the principal in the sampled schools had above 26 years of teaching experience. This implies that the principals had adequate experience, competency and proficiency to ensure resources in their school are regularly and properly used in a way likely to influence students' academic performance. This finding concurred with Olugbenga (2020) that school managers become competent in their administrative roles in planning and coordinating all activities in the utilisation of institutional resources. For teachers 35 of them, which

is (15.9%) had an experience below 5 years. The group comprises of recently employed teachers who had little experience to effectively use the school resources. 104 teachers, which form (47.3%), had a teaching experience of between 6 to ten years. Another group of teachers had been teaching to between 11 to 15 years forming (12.7%) N=28. Rice (2010) on his research revealed that inexperienced teachers were less effective, they had less mastery of content and little positive influence on student success. These findings agreed with Ewetan & Ewetan (2015) who revealed that teachers experience had a positive influence on students' academic performance.

#### **4.3.6 KSCE Mean Scores for county secondary schools in Makueni County**

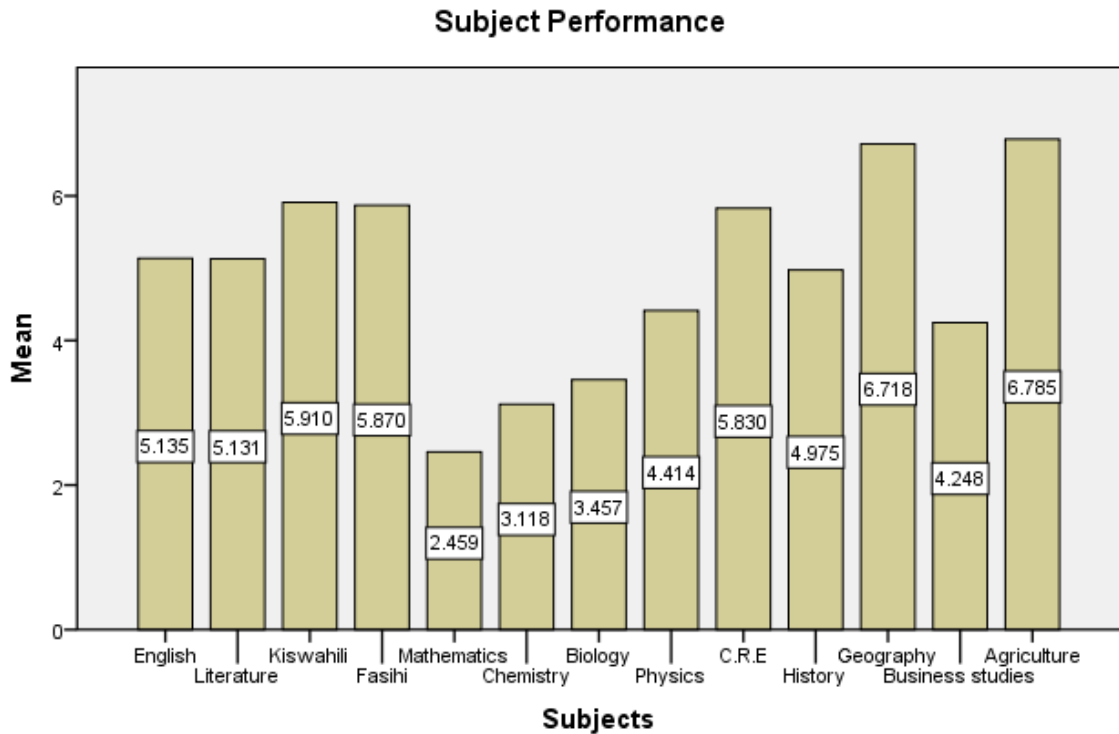
The study sought to determine the students' academic performance as the dependent variable. Students performance is reflected in the schools' K.C.S.E. mean scores from county secondary schools in Makueni County. Principals were asked to give the mean scores for their schools K.C.S.E 2022 which formed the dependent variable of this study. Table 4.6 below shows the principals' feedback on the mean score of their schools

**Table 4.6: KCSE Mean Score for all subjects in county secondary schools in Makueni County**

	Minimum	Maximum	Mean	Std. Deviation
English	3.2100	8.3300	5.134909	1.4302921
Literature	3.0000	8.3300	5.130759	1.4300976
Kiswahili	3.700	9.400	5.90983	1.304192
Fasihi	2.900	9.400	5.86983	1.381684
Mathematics	1.3700	3.3100	2.459445	.5141894
Chemistry	2.0000	4.3000	3.117959	.7414095
Biology	2.2100	5.7000	3.457377	.8488033
Physics	1.9500	6.4000	4.414450	1.2860334
C.R.E	4.0200	9.8000	5.830168	1.6006098
History	3.4820	6.6400	4.975309	1.1314819
Geography	2.6000	10.5000	6.717809	1.8823480
Business studies	2.2200	6.5600	4.247832	1.2281638
Agriculture	4.000	10.340	6.78479	2.271197
<b>Overall mean</b>			<b>4.926</b>	<b>1.3112</b>

Source: County Education Office (2022).

Table 4.6 above indicates that Makueni County had an overall mean score of 4.926 and a standard deviation of 1.3112 in K.C.S.E in county secondary schools. The minimum mean mark was 2.46 which was in mathematics subject. The other poorly performed subject was Chemistry 3.12 while the maximum mean mark was 6.78 in Agriculture. The other well performed subject was Geography with a Mean of 6.72. This same information on academic performance which is the depended variable, was also portrayed on a bar chart below.



**Figure 4.2: Bar graph showing students' academic performance**

Source: County Education Office (2022).

The above figure implies that the academic performance of students is low as is shown by an overall mean grade of 4.926, considered as D+. The least mean grade for university entry in Kenya is a mean of 7, C+. This is according to Kenya Universities and Colleges Central Placement Service (KUCCPS, 2019).

University education is regarded very vital for attainment of the 21st Century knowledge and skills. Studies have shown that many learners who made up to university got degrees and obtained lucrative jobs which earned them desired wages and helped in poverty reduction in the society. Hout (2012), besides, having upward social and economic development, OECD (2010; 85, Chan, 2016 and Bosupeng, 2017). This result concurred with Okeke (2008) and Okeye (2010) who showed that unsatisfactory learners' academic performance in physics was as a result of teacher's teaching approaches and that proper and efficient use of resources was crucial in

facilitating acquisition of learning concepts and enhancing students' academic performance. Similarly, this finding is in agreement with Lamas (2015) who revealed that Students' academic performance is shown mostly by the grade achieved by learners after assessments. Students' academic performance ensures attainment of learning (educational) goals.

This section contains information addressing the four objectives.

#### **4.4 Utilisation of Textbooks and its Influence on Students' Academic Performance**

Data was obtained from the principals and teachers to investigate the utilisation of textbooks and students' academic performance. The objective was investigated by collecting information using both quantitative and qualitative data. Quantitative data were analysed using descriptive statistics such as means, percentages, standard deviation while in inferential statistics such as the multiple regression was used to predicted the influence that exists between the independent variables (utilisation of textbooks) and the dependent variable (students' academic performance). Qualitative data were analysed by use of thematic analysis.

##### **4.4.1 Teachers Responses on the Utilisation of Textbooks**

Objective one was to determine the utilisation of textbooks and its influence on students' academic performance. This study sought to determine the utilisation of textbooks and students' academic performance. The level of utilization of text books among the selected secondary schools was assessed through the use of Likert-itemed questionnaire which helped the respondents to rate the utilization of the text books in various subjects. Using the rating on a five-point Likert scale ranging from very highly utilized (5) to very low (1) for utilization, the level of utilization of the text

books was gauged per subject. For easy interpretation and applicability in inferential analysis, the responses were converted into continuous scale ranging from 1 to 5, where higher scores represented very high utilization, and vice versa. Table 4.7 presents the findings on utilization of text books per subject's summarized in mean and standard deviation.

**Table 4.7: Utilization of textbooks**

Utilization of textbooks resources	5		4		3		2		1		Mean	SD Dev.
	N	%	N	%	N	%	N	%	N	%		
<b>A</b> English textbook 4	75	30	79	31.6	33	13.2	49	19.6	14	5.6	3.45	1.267
<b>B</b> Literature set book	106	42.4	66	26.4	24	9.6	53	21.2	1	0.4	3.85	1.154
<b>C</b> Kiswahili textbook 4	103	41.2	55	22.0	26	10.4	65	26	1	0.4	3.89	1.154
<b>D</b> Fasihi set book	101	40.4	58	23.2	24	9.6	65	26	2	0.8	3.76	1.250
<b>E</b> Mathematics textbook 4	101	40.4	75	30	50	20	24	9.6	1	0.4	4.01	0.996
<b>F</b> Chemistry textbook 4	141	56.4	94	37.6	4	1.6	24	9.6	1	0.4	4.46	0.755
<b>G</b> Biology textbook 4	147	58.8	86	34.4	2	0.8	10	4.0	1	0.4	4.46	0.807
<b>H</b> Physics textbook 4	113	45.2	92	36.8	8	3.2	37	14.8	0	0.0	4.12	1.032
<b>I</b> C.R.E textbook 4	115	46	104	41.6	1	0.4	1	0.4	29	11.6	4.51	0.666
<b>J</b> History & government textbook 4	145	58.0	95	38	3	1.2	7	2.8	0	0	4.10	1.233
<b>K</b> Geography textbook 4	121	48.4	99	39.6	1	0.4	29	11.6	1	0.4	4.25	0.946
<b>L</b> Business studies textbook 4	125	50.0	64	25.6	21	8.4	40	16	0	0	4.10	1.104
<b>M</b> Agriculture textbook 4	106	42.4	66	26.4	24	9.6	53	21.2	1	0.4	3.76	1.235
<b>Overall mean</b>											<b>4.06</b>	<b>1.046</b>

Source: Instruments

Table 4.7 above reveals that although many county secondary schools in Makueni County, have not attained text book - student ratio of 1:1, majority of them have fairly strong text book - student ratios, as reflected by an overall mean of 4.06 with a standard deviation of 1.046. This implies that, on average, the text book-students ratio among the sampled schools is slightly above 4:5, meaning that at least 80.0% of the students have a textbook in each of the subjects. This has been enhanced by the government's review of the text book distribution policy that culminated in engagement of publishers of duly approved textbooks to deliver the text books directly to the schools. This findings concurs with Lepik's (2015) study done in Estonia that revealed that majority of difficulties learners came across when doing exercises in class and home assignment were drawn from mathematics school books and that, mathematics textbooks could be asserted to be very vital and widely utilised material for instruction and learners' learning resources. This was agreed by Hadar (2017) asserted that there existed direct correlation between opportunities and learners' academic performance. In a similar opinion, Van den Ham and Heinze (2018), on their study conducted in German, alleged that the choice of mathematics educators' guides significantly affected the academic performance of students in the mathematics subject. Therefore, effective utilisation of textbooks in all subjects influence performance in the excellence performance among the learners.

#### **4.4.2 Principals' Response on Utilisation of Textbooks**

The principals agreed that text books are widely used by both teachers and students. Student book ratio for the core subjects, languages, sciences (chemistry, biology, physics) and mathematics is 1:1. Presence of books gives students a chance to read them, do all the exercises in them without sharing and use them during group

discussions. This helps the learners enhance their reading skills, internalize the knowledge and improve their school reading culture. In doing this they improve academically.

Some qualitative data from principals' interviews on utilisation of textbooks and students' academic performance direct words were recorded from one of the principals who said this;

*If there is a learning resource which is in plenty in schools are the textbooks which the government is supplying, they supply in excess of the current enrolment. So, the sharing is 1:1. Few learners share books, although, with subjects which are not core, the ratio of sharing is slightly higher. Our students have poor reading culture despite our efforts to encourage them to work hard. Hence many books continue to pile dust on the shelves (Principal 8).*

This sentiment shows that text books are used regularly and this can improve students' academic success. The GoK (2019) in the MoE Basic Educational Statistical Booklet, the policy on student book ratio for the core subjects, languages, sciences (chemistry, biology, physics) and mathematics, the ratio of 1:1 student book sharing has been achieved in the majority of the public county secondary schools in the county. This finding agrees with (Mogaka, Kariuki and Ogeta 2019) that making effective use of reference books positively enhances learner performance. These results concurred with Tornroos (2005) that information from Finnish TIMSS 1999, showed that textbook utilisation positively influenced the performance of students in the mathematics subject.

#### 4.4.3 Influence of utilization of textbooks on students' academic performance in public secondary schools in Makueni County.

H01. Utilization of textbooks had a significant influence on students' academic performance in public secondary schools in Makueni County.

Research Objective 1 sought to establish the utilization of textbooks and its influence on students' academic performance in public secondary schools in Makueni County. This objective was also addressed by testing hypothesis 1 which stated that: Utilization of textbooks had a significant influence on students' academic performance in public secondary schools in Makueni County.

The hypothesis was investigated by use of the Chi-square ( $\chi^2$ ) test, at 0.05 level of significance and at 1 degree of freedom. The Chi-square ( $\chi^2$ ) test is a statistical tool made to examine whether two categorical or nominal variables (utilisation of textbooks and students' academic performance) are independent of one another (McHugh, 2013).

If the p-value is smaller than 0.05 significance level the null hypothesis is rejected, as opposed to, if the p-value is greater than 0.05 level of significance, then the null hypothesis is accepted. The results are shown on table the below.

**Table 4.8: Results of hypothesis 1**

Independent variable	Hypothesis	Chi-sq. value	df	Chi-sq. p value	Sig. Value	Result	Decision
Utilization of textbooks	H02	31.90	10	0.000	0.05	0.000<0.05	H02: rejected

Source: Instruments.

Table 4.8 above shows a chi-square test of independence computed comparing the frequencies of utilization of textbooks and students' academic performance in public secondary schools in Makueni County. A significant interaction of ( $X^2(10) = 31.90$ ,  $p < 0.05$ ) was found, implying utilization of textbooks affected students' academic performance in public secondary schools in Makueni County. Therefore, the null hypothesis was rejected and the alternative one accepted that there was a significant influence between utilization of textbooks and students' academic performance in Makueni County public secondary schools.

However, to estimate the level of influence of utilization of text books on student's academic achievement, a coefficient of determination was computed using the regression analysis and the result was as shown in Table 4.9.

**Table 4.9: Model Summary on Regression Analysis of Influence of Utilization of Text books on Student's Academic performance**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.815 <sup>a</sup>	.664	.650	.63512

a. Predictors: (Constant), textbook utilization

Source; Instruments

Table 4.9 above shows the model summary reveals that the level of utilization of text books accounted for 66.4%, as signified by coefficient  $R^2 = .664$ , of the variation in students' academic performance. This finding implies that variation in the level of utilization of text books explained about 66.4% of the variability in students' academic performance. This infers that other factor not studied in this objective contributed to 33.6% of students' academic performance in the county. This

therefore meant that there are other factors other than utilization of textbooks that contribute to students' academic performance in the county.

To check how well the sample data fitted in the regression model, *F* value was obtained. The model summary of ANOVA was shown in table 4.10 below.

**Table 4.10: Goodness of Fit Summary for utilization of textbook Resources**

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	167.352	9	18.595	46.098	.000 <sup>b</sup>
	Residual	84.708	210	.403		
	Total	252.061	219			

a. Dependent variable: School mean in 2022 KCSE

Predictors: (Constant), Agriculture textbook utilisation, Chemistry textbook utilisation, History textbook utilisation, Biology textbook utilisation, Fasihi textbook utilisation, Geography textbook utilisation, Business studies textbook utilisation, C.R.E textbook utilisation, Mathematics textbook utilisation.

**Table 4.11: Multiple Regressions on utilization of textbook resources and students' academic performance**

Model		Coefficients <sup>a</sup>				
		Unstandardized		Standardized	t	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	.090	2.220		.041	.968
	Fasihi textbook utilization	.373	1.409	.287	.265	.791
	Mathematics textbook utilization	.680	1.332	.728	.510	.611
	Chemistry textbook utilization	-.396	.447	-.364	-.885	.377
	Biology textbook utilization	-1.343	.527	-1.191	-2.548	.012
	C.R.E textbook utilization	2.247	1.565	1.466	1.435	.153
	History textbook utilization	-.201	.208	-.171	-.968	.334
	Geography utilization	1.408	.420	.902	3.352	.001
	Business studies utilization	-1.484	1.829	-1.076	-.812	.418
	Agriculture utilization	-.392	1.731	-.351	-.227	.821

a. Dependent Variable: School mean in 2022 KCSE

Source: Instruments

The standard beta coefficients in table 4.11 above indicated that utilization of mathematics textbook explained 72.8% of variation in student performance holding the other factors constant. Utilization of chemistry textbook explained 36.4% of variation in student performance holding the other factors constant. Utilization of Biology textbook explained 119.1% of variation in student performance holding the other factors constant. Utilization of Geography textbook explained 90.2% of variation in student performance holding the other factors constant. Utilization of CRE textbook explained 146.6% of variation in student performance holding the other factors constant. Utilization of Agriculture textbook explained 35.1% of variation in student performance holding the other factors constant. Utilization of history textbook explained 17.1% of variation in student performance holding the other factors constant.

The table also deduced that when the utilisation of Fasihi textbook increased by 1 unit, the academic performance (Y) increased by 1.273 units (0.090+0.373). When the utilisation of Mathematics textbook increased by 1 unit, the academic performance (Y) increased by 1.58 units (0.090+0.680). When the utilisation of Chemistry textbook increased by 1 unit, the academic performance (Y) increased by 0.504 units (0.090-0.396). When the utilisation of Biology textbook increased by 1 unit, the academic performance (Y) increased by 2.243 units (0.090+1.343). When the utilization of CRE textbook increased by 1 unit, the academic performance (Y) increased by 3.147 units (0.090+2.247). When the utilization of History textbook increased by 1 unit, the academic performance (Y) increased by 0.699 units (0.090-0.201). When the utilization of Agriculture textbook increased by 1 unit, the academic performance (Y) increased by 0.507 units (0.090-0.393).

This study adopted Education Production Function theory by (Bowles 1970) which relates school inputs to the measure of outputs produced in terms of test scores. The theory explains how the students' academic performance was influenced by utilisation of textbooks. The variables here include the amount and quality of teaching services, the physical facilities of the school, and the period the student was exposed to these inputs. In the model, a certain transformation took place in schools, that by use of the textbooks through certain processes and activities of teaching and learning, an achievement on academic results was produced. From the findings, it was revealed that utilisation of textbooks influenced students' academic performance. From the results of hypothesis one, a significant interaction was found ( $X^2(10) = 31.90, p < 0.05$ ), the p-value (0.000) was less than 0.05, therefore there was positive influence between utilisation of textbooks and students' academic performance in public secondary schools in Makueni County.

#### **4.5 Utilisation of school infrastructure and its influence on students' academic performance**

The second objective of the study was to establish the utilisation of school infrastructure and its influence on students' academic performance. Information was collected from principals and teachers on utilisation of school infrastructure on students' academic performance.

##### **4.5.1 Teachers responses on utilisation of school infrastructure on students' academic performance**

The following responses on utilisation of school infrastructure on students' academic performance were given by teachers. The level of utilization of school infrastructure among the selected secondary schools was assessed through the use of

Likert-itemed questionnaire which helped the respondents to rate the utilization of school infrastructure in various subjects. Using the rating on a five-point Likert scale ranging from very highly utilized (5) to very low (1) for utilization, the level of utilization of school infrastructure was gauged per building. For easy interpretation and applicability in inferential analysis, the responses were converted into continuous scale ranging from 1 to 5, where higher scores represented very high utilization, and vice versa. Table 4.12 presents the findings on utilization of school infrastructure which is summarized in mean and standard deviation.

**Table 4.12: Utilization of school infrastructure resources**

Utilization of school infrastructure resources	5		4		3		2		1		Mean	SD Dev.
	N	%	N	%	N	%	N	%	N	%		
<b>a</b> Classrooms	106	42.4	66	26.4	24	9.6	53	21.2	1	0.4	3.89	1.182
<b>b</b> Science lab	103	41.2	55	22.0	26	10.4	65	26.0	1	0.4	3.78	1.244
<b>c</b> Chemistry lab	105	42.0	55	22.0	25	10.0	64	25.6	1	0.4	3.80	1.243
<b>d</b> Biology lab	101	40.4	58	23.2	24	9.6	65	26.0	2	0.8	3.76	1.250
<b>e</b> Physics lab	101	40.4	75	30.0	50	20.0	24	9.6	0	0.0	4.01	0.996
<b>f</b> School library	122	48.8	96	38.4	17	6.8	15	6.0	0	0.0	4.30	0.842
<b>g</b> Computer lab	46	18.4	110	44.0	37	14.8	24	9.6	33	13.2	3.45	1.267
<b>Overall mean</b>											<b>3.86</b>	<b>1.146</b>

Source: Instruments.

Table 4.12 above revealed that although many county secondary schools in Makueni County, had not attained a good infrastructural resource, majority of them had an average infrastructural resource to student ratio, as reflected by an overall mean of

3.86 with a standard deviation of 1.146. This implies that, on average, the infrastructure-students ratio among the sampled schools was slightly below 4:5, meaning that at about 80.0% of the students' population were accommodated by the available infrastructure.

As concerns the classrooms, the county secondary schools had not achieved good classroom resources which had a mean of classroom student ratio of 3.89 and a standard deviation of 1.182. This suggested that on average, classroom student ratio in the selected county secondary schools was a bit lower than 4:5, meaning that approximately 80% of the learners in the schools occupied the classrooms which were available.

Research done recently in the U.K. revealed that both conducive learning environment and well-designed components of the institutional infrastructure made 16 % improvement in pupils' academic performance in primary schools. This study also revealed that school buildings designed in style impacted positively on learning in three interconnected elements namely: the natural environment, school beauty and willingness to provide a conducive environment for learning.

These findings agreed with Devi (2020) who alleged that in majority of schools that took part in the study, had no isolated science laboratories. Further, a good number educators had challenges when doing practicals in science subject since most of the classrooms were congested with learners besides having limited science resources and reagents. Similarly, Adede (2012) reported that school plant is a major foundation in provision of quality education in all categories on learning institutions. School infrastructure include the following: science laboratories, dormitories, classes, the computer laboratory, sanitation facilities, the halls and the school

library. Classrooms are utilised every day for instruction, group discussions and when doing class assignments. The libraries are used for individual study and for students to search for information from the library materials. The fields are made use of for ball games, athletics and other activities. Teachers and students use the other school infrastructure for the right uses. School infrastructure is very important if providing shelter, comfort and security when teaching and learning is taking place and in enhancing the standards of education provision.

According to the GoK (2016), In Kenyan public county secondary schools, the recommended classroom – student is 1: 41. However, many of the county secondary schools accommodate higher classroom - student ratio as reflected by an overall mean of 3.86 with a standard deviation of 1.146. This implied that, on average, the classroom - student ratio among the sampled schools was slightly below the ratio of 4:5, meaning that at about 80.0% of the students’ population were accommodated by the available infrastructure.

**Table 4.13: Number of students accommodated in each class**

	<b>Frequency</b>	<b>Percent (%)</b>
Below 41	48	21.8
41 and above	172	78.2
<b>Total</b>	<b>220</b>	<b>100.0</b>

Source: Instruments

From the above table, majority of the respondents (78.2%, N=172) said that classes in their school had more than 41 students. This implies that classes in county secondary schools of Makueni County are congested. This is as a result of the 100% transition policy. This leads into overutilization which affected effective teaching and had a negative influence on learners’ academic performance. It’s therefore

necessary for the government to build more classes in these schools in order to accommodate the increasing student population.

#### **4.5.2 Principals' responses on utilisation of school infrastructure**

The study sought to determine the influence of utilisation of school infrastructure and students' academic performance. The responses were given through document analysis and interview schedule. One of the principals gave these remarks;

*We have only one lab which is used for the three science subjects and even some of the equipment are in bad condition due to poor storage and mishandling. So, the laboratory is always in use, the classrooms have many students. However, they are trying their level, though their performance is average. Principal 1.*

These sentiments showed that some of the school infrastructures are widely used and which is likely to have a negative effect on learner performance.

The Statistical Education Booklet by the Ministry of Education revealed that average size of a class is 41 students per class in secondary schools, however, different class sizes were evident in different counties and sub-counties (GoK 2016 p. 18). Most classrooms in Makueni County had more than the recommended class size, more than 41 students per class, probably because of the 100 percent transition which had taken a good course.

Another principal said this:

*Classrooms are never enough; this is caused by the implementation of the 100 policies on transition. Students' intake is increasing and so classes and lockers need to be increased every time. That is why you can see those tents there, they are occupied by form two's. We have already requested for assistance from CDF and we are still waiting (principal -19).*

These sentiments showed that classrooms were excessively utilised and could influence their academic grades in a positive way. This finding agrees with Olaleye, Ajayi, Oyebola and Ajayi (2017) who did a study on the effect of congested classes on learners' achievement in chosen government sponsored secondary institutions in Surelere Local Government of Lagos State, Nigeria and revealed that congested rooms in which learners learn had a negative impact on the opinions of students towards their learning. It also showed that classrooms that had more than the required number of learners affected effective pedagogy. Further, it made it known that congested classes contributed to poor students' achievement in government learning institutions in the area. A study by (Akinsanya 2010) on different deployment and usage of employees on academic performance in learning institutions and found out that physical facilities and employees were critically insufficient, where they were provided, were not effectively used. The study also showed that school buildings, libraries and classrooms were insufficient and this hindered desirable learning. This finding agreed with Wali, Abulfathl & Mustapha (2019) who revealed that conducive class environment influenced better achievement of better academic grades in English.

#### **4.5.3 The influence of utilisation of school infrastructure and Students' academic performance in Makueni County secondary schools**

*H02. Utilization of school infrastructure had no significant influence on students' academic performance in public secondary schools in Makueni County.*

Objective two was to determine the utilization of school infrastructure and its influence on students' academic performance in public secondary schools in Makueni County.

To investigate the influence of utilization of school infrastructure and students' academic performance in public secondary schools, the null hypothesis was determined by a Chi-square ( $\chi^2$ ) test, at 0.05 level of significance and at 1 degree of freedom. The findings were shown on the table below.

**Table 4.14: Results of hypothesis 2**

<b>Independent variable</b>	<b>Hypothesis</b>	<b>Chi-sq. value</b>	<b>df</b>	<b>Chi-sq. p value</b>	<b>Sig. Value</b>	<b>Result</b>	<b>Decision</b>
Utilization of school infrastructure resources	H03	201.67	5	0.000	0.05	0.000<0.05	H03: rejected

Source: Instruments

Table 4.14 above indicates that a chi-square test of independence was computed comparing the frequencies of school infrastructure utilization and students' academic performance in public secondary schools in Makueni County. A significant interaction was found ( $X^2(5) = 201.67, p < 0.05$ ). If the p-value achieved is less than 0.05, the null hypothesis is rejected and inference arrived at that there exists a significant difference. If the p-value is larger than 0.05, a firm decision is made that there does not exist a significant difference. The p value (0.000) is less than the significant level of 0.05. The null hypothesis was rejected and the alternative accepted. Table 4.13 shows that there is a significant influence between school infrastructure utilization and students' academic performance in public secondary schools in Makueni County. This implied that students' academic performance in public secondary schools in Makueni County was statistically influenced by utilization of school infrastructure resource.

However, to estimate the level of influence of utilization of school infrastructure on student's academic performance, a coefficient of determination was computed using the regression analysis and the result was as shown in Table 4.15.

**Table 4.15: Model Summary on Regression Analysis of Influence of Utilization of School infrastructure on Student's Academic performance**

<b>Model Summary</b>				
<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.536 <sup>a</sup>	.287	.261	.93844

a. Predictors: (Constant), school infrastructure

Source: Instruments

The model summary revealed that the level of utilization of school infrastructure accounted for 28.7%, as signified by coefficient  $R^2 = .287$ , of the variation in students' academic performance. This finding implied that variation in the level of utilization of school infrastructure explains about 28.7% of the variability in students' academic performance. This infers that other factors not studied in this objective contribute to 71.3% of students' academic performance in the county. This therefore meant that there were other factors other than utilization of school infrastructure that contributed to students' academic performance in the county. To check how well the sample data fitted in the regression model,  $F$  value was obtained. The model summary of ANOVA was shown in table 4.15 below.

**Table 4.16: Goodness of Fit Summary for utilization of school infrastructure resources**

		ANOVA <sup>a</sup>				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.753	7	9.822	11.153	.000 <sup>b</sup>
	Residual	170.851	194	.881		
	Total	239.604	201			

Dependent Variable: School mean in 2022 KCSE

Source: Instruments

Predictors: (Constant), Computer lab utilization, Classrooms Utilization Biology Lab Utilization, Science lab Utilization, School library Utilization, Physics lab Utilization, Chemistry lab Utilization.

Table 4.16 above showed that utilisation of school infrastructure helped to explain variation on student performance. This was demonstrated by  $F$  value  $F(7, 194) = 11.153$ ,  $p < .05$  indicating that the model was justifiable for the regression equation. Accordingly,  $R^2$  which was 28.7% was significant. A multiple regression check was done to examine the effect of utilisation of school infrastructure on student performance in Makueni County. This was shown on table 4.17 below.

**Table 4.17: Multiple Regressions on utilization of school infrastructure resources and students' academic performance**

Model		Coefficients <sup>a</sup>				
		Unstandardized		Standardized	t	Sig.
		Coefficients				
		B	Std. Error	Beta		
1	(Constant)	3.868	.615		6.292	.000
	Classrooms Utilization	.228	.171	.142	1.334	.184
	Science lab Utilization	.194	.157	.137	1.237	.218
	Chemistry lab Utilization	.023	.153	.018	.151	.880
	Biology lab Utilization	.039	.087	.042	.453	.651
	Physics lab Utilization	-.494	.108	-.497	-	.000
	School library Utilization	-.553	.111	-.512	-	.000
	Computer lab Utilization	.690	.148	.529	4.673	.000

a. Dependent Variable: School mean in 2022 KCSE

Source: Instruments

The standard beta coefficients in table 4.17 above indicated that utilisation of classrooms explained 14.2% of variation in student performance holding the other factors constant. Utilisation of science laboratory explained 13.7% of variation in student performance holding the other factors constant. Utilisation of chemistry laboratory explained 1.8% of variation in student performance holding the other factors constant. Utilisation of biology laboratory explained 4.2% of variation in

student performance holding the other factors constant. Utilisation of physics laboratory explained 49.7% of variation in student performance holding the other factors constant. Utilisation of school library explained 51.2% of variation in student performance holding the other factors constant. Utilisation of computer laboratory explained 52.9% of variation in student performance holding the other factors constant.

The table further explain when the utilisation of classrooms ( $x_1$ ) increased by 1 unit, the academic performance (Y) increased by 4.096 units ( $3.868+0.228$ ). When the utilisation of science laboratories increased by 1 unit, the academic performance (Y) increased by 4.062 units ( $3.868+0.194$ ). When the utilisation of chemistry laboratories increased by 1 unit, the academic performance (Y) increased by 3.891 units ( $3.868+0.023$ ). When the utilisation of biology laboratories increased by 1 unit, the academic performance (Y) increased by 3.907 units ( $3.868+0.039$ ). When the utilisation of physics laboratories increased by 1 unit, the academic performance (Y) increased by 3.374 units ( $3.868-0.494$ ). When the utilisation of school library increased by 1 unit, the academic performance (Y) increased by 3.315 units ( $3.868-0.553$ ). When the utilisation computer laboratories of increased by 1 unit, the academic performance (Y) increased by 4.558 units ( $3.868+0.690$ ). There is need to enhance utilisation of school infrastructure for the purpose of improving students' academic performance.

This study adopted Education Production Function theory by (Bowles 1970) which relates school inputs to the measure of outputs produced in terms of test scores. The theory explains how the students' academic performance is dependent on utilisation of the school infrastructure resources. The variables

here include utilisation of school infrastructure resources and the students' academic performance which are related to the amount and quality of teachers and teaching services, the physical facilities and instructional materials of the school and the period the student is exposed to these inputs. In the model, a certain transformation takes place in schools, that by using utilisation of school infrastructure through certain processes and activities of teaching and learning, an achievement on academic results was achieved. From the findings, it was revealed that utilisation of school infrastructure resources, influenced students' academic performance. From hypothesis two, it was realized that utilisation of school infrastructure had significant interaction ( $\chi^2 (5) = 201.67, p < 0.05$ ). There was positive influence between utilisation of school infrastructure and students' academic performance in public secondary schools in Makueni County. Therefore, utilisation of school infrastructure affected students' academic performance in public secondary schools in the County.

#### **4.6 Utilisation of teacher resources and its influence on students' academic performance**

The third objective of the study was to determine utilisation of teacher resources and its influence on students' academic performance. Information from teachers and the principals on utilisation of teacher resources and students' academic performance in public secondary schools in Makueni County was collected and recorded.

The findings were used to address research hypothesis 3 that there is no significant influence between utilisation of teacher resources and students' academic performance in public secondary schools in Makueni County. Data were collected using questionnaires and document analysis from teachers and an interview schedule

from principals. Quantitative data were analysed using descriptive statistics such as means, percentages, standard deviation while in inferential statistics, the chi-square was used in testing the hypothesis and multiple regression were used to predict the influence between the independent variables (utilisation of teacher resources) and the dependent variable (students' academic performance). Qualitative data were analysed by thematic analysis.

#### **4.6.1 Teachers' response on utilization of teacher resources**

The study sought to establish the influence of utilization of teacher resources and students' academic performance. The level of utilization of teacher resources among the selected secondary schools was assessed through the use of Likert-itemed questionnaire which helped the respondents to rate the utilization of the teacher resources in teaching various subjects. Using the rating on a five-point Likert scale ranging from very highly utilized (5) to very low (1) for utilization, the level of utilization of the teacher resources was gauged per subject. For easy interpretation and applicability in inferential analysis, the responses were converted into continuous scale ranging from 1 to 5, where 5 represented very high utilization, and vice versa. Table 4.17 presents the findings on utilization of text books per subject's summarized in mean and standard deviation.

**Table 4.18: Utilisation of teacher resources**

Utilization of teacher resources	5		4		3		2		1		Mean	SD Dev.
	N	%	N	%	N	%	N	%	N	%		
Teacher A	93	37.2	81	32.4	25	10.0	48	19.2	3	1.2	3.85	1.154
Teacher B	46	18.4	110	44.0	37	14.8	24	9.6	33	13.2	3.45	1.267
Teacher C	75	30.0	79	31.6	33	13.2	49	19.6	14	5.6	3.61	1.254
Teacher D	93	37.2	81	32.4	25	10.0	48	19.2	3	1.2	3.85	1.154
Teacher E	46	18.4	110	44.0	37	14.8	24	9.6	33	13.2	3.45	1.267
Teacher F	75	30	79	31.6	33	13.2	49	19.6	14	5.6	3.61	1.254
Teacher G	93	37.2	81	32.4	25	10.0	48	19.2	3	1.2	3.85	1.154
Teacher H	106	42.4	66	26.4	24	9.6	53	21.2	1	0.4	3.89	1.182
Teacher I	103	41.2	55	22.0	26	10.4	65	26.0	1	0.4	3.78	1.244
Teacher J	75	30	79	31.6	33	13.2	49	19.6	14	5.6	3.45	1.267
<b>Overall Mean</b>											<b>3.68</b>	<b>1.220</b>

Source: Instruments.

Table 4.18 revealed that although many county secondary schools in Makueni County, had not attained the student-teacher ratio of 29:1, Student teacher ratio in public secondary schools currently stands at 29:1. This was according to the Ministry of Education Basic Educational Booklet 2019 (GoK, 2019). Therefore,

majority of the schools had fairly high student-teacher ratios, as reflected by an overall mean of 3.68 with a standard deviation of 1.220. This implied that, on average, the student-teacher ratios among the sampled schools were slightly below 4:5, meaning that many students were sharing a teacher. This might have been caused by the implementation of the 100 percent transition from primary to secondary schools without commensurate hiring of teacher resources. This finding concurred with Iheonunekwu (2012) that effective use of instructors went well with adequacy and standard teaching and learning resources. Besides, taking them to regular refresher courses on their teaching methodology was of paramount importance as their knowledge content was upgraded and also mastered.

### **Teacher student ratio**

**Table 4.19: Teacher student ratio**

<b>Teacher-student ratio</b>	<b>Frequency</b>	<b>Percent (%)</b>
1:50	4	1.8
1:40	30	13.6
1:30	41	18.6
1:40	27	12.3
1:50	118	53.6
<b>Total</b>	<b>220</b>	<b>100.0</b>

Source: Instruments

From table 4.19 above which showed high ratio of teacher to student ratio of 1:50, as it had the highest frequency of 118. This suggested there were high teacher student ratios in county secondary schools in the county. This study had similar opinion with khan & Ghosh (2016) which showed that low standards of teaching was associated with drop in performance of students. The tendency applied to almost all types and levels of learners, and that the study of Nassira (2016) alleged

that highly trained teachers were competent and had adequate abilities to effect positive student success.

**Table 4.20: Teachers' time of the syllabus completion**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	80	36.4	36.4	36.4
	Yes	140	63.6	63.6	63.6
Total		220	100.0	100.0	

Source: Instruments

From the above table (4.20) shows that 36.4 percent of the teachers did not complete the syllabus on time as compared to those who completed the syllabus on time.

**Table 4.21: How teachers attended the allocated classes on time**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	98	44.5	44.5	44.5
	Yes	122	55.5	55.5	55.5
Total		220	100.0	100.0	

Source: Instruments

From table 4.21 above which showed how teachers attended the allocated classes, it could be deduced that 55.5% were in class timely while 44.5% wasted some minutes somewhere, may be on the way or fetching their professional documents. Any single minute wasted suggested reduction of the actual study time in classes and lessened contact hours between the teachers and the learners. This would contribute negatively to students' academic achievement. This also implied that timely attendance of classes would contributed to early syllabus coverage and adequate content delivery

#### 4.6.2 Principals' response on utilization of the teacher resources.

The study sought to determine principals' response on utilization of the teacher resources. A lot of information on utilisation of teacher resources was by given the respondents such as:

From the interview schedule, one of the following words were said by a principal;

*Teachers attend classes very well; I don't follow to check whether all classes are being taught, however what happens during the process of teaching and learning is what I do not understand because the performance is not very good. Is it the entry behaviour of the learners or is there another? problem? Most of my teachers have the right qualifications for except a few who are employed by the Board of Management, (Principal-10).*

This sentiments by this principal show that teachers attended classes well and the academic performance of students was expected to be good. This findings concurred with the study of Ndugu (2014) that teachers' performance was greatly determined by their qualifications, motivation, attitude, and the education facilities as well as staff professional development programmes.

These words were said by another of the principals;

*I'm very strict when supervising teachers because the core mandate of my work is to oversee thorough curriculum implementation. My school is expected to produce excellent results, even according to our school vision and mission, we are expected to fulfill what we have sworn we will do. Teachers are supposed to adhere to the TSC Regulations enlisted on the TPAD to thoroughly follow the seven teaching standards. So, we are strict when we are performing our duties in order to maintain quality teaching in our school. Why the performance is a bit low, I cannot explain, (Principal-30).*

This sentiments above showed that the principals, as well as teachers did their duties well to ensure effective teacher resource utilisation. This meant to improve the academic performance of students. This finding was in par with (Mugambi 2015) that school managers made use of various strategies in overseeing the teaching and learning practices in their schools. Several methods they employed included selecting some spy learners to observe instructors' attendance of classes, and involving their deputies to observe carefully over teachers doing the actual teaching in class. Besides, making administrative decisions. There was a similar agreement with (Okoth 2019) who showed that heads of schools who excelled academically were those who supervised and provided direction and administrative teaching activities within their institutions.

From the principal's interview, these words were recorded down that

*Due to the 100 percent transition, we are facing a lot of challenge with adequate staffing, teacher-pupil ratio is very high, in addition to students being admitted with very poor grades. Further, we are forced to employ BoM teachers who are not adequately trained, have little content mastery and do not have work ethics.*

*Supervision of teachers is thorough, however covering the syllabus is a major problem, though we are having extra classes in the morning and evenings, during preps time. I have requested for teachers numerous times but it takes some time to be given one.*  
(Principal 16).

This information revealed that many schools had high student; teacher ratios, which would give the reason why the syllabi was not adequately covered despite teachers' class attendance being good. This could affect proper pedagogy by teachers and influence students' academic performance negatively. This finding concurred with

Mwaniki (2011) that inadequacy of teachers led to high teacher student ratios, contributing to low teacher learner contact hours and underutilization. This finding also expressed the same opinion with Usman (2016) who revealed that the quality, quantity and effective operations of teacher resources should be put into consideration if desired students' academic performance was expected. Teacher productivity was reflected on student academic grades achieved at specified time.

#### **4.6.3 Influence of utilization of teacher resources on students' academic performance**

*H03. Utilization of teacher resources had no significant influence on students' academic performance in public secondary schools in Makueni County.*

Objective three was to determine the utilization of teacher resources and its influence on students' academic performance in public secondary schools in Makueni County. To investigate the influence of utilization of teacher resources and students' academic performance, the null hypothesis was determined by a Chi-square ( $\chi^2$ ) test, at 0.05 level of significance and at 1 degree of freedom. The findings were shown on the table below.

**Table 4.22: Results of hypothesis 3**

<b>Independent variable</b>	<b>Hypothesis</b>	<b>Chi-sq. value</b>	<b>df</b>	<b>Chi-sq. p value</b>	<b>Sig. Value</b>	<b>Result</b>	<b>Decision</b>
Utilization of teacher resources	H03	46.01	12	0.000	0.05	0.000<0.05	H03: rejected

Source: Instruments

Table 4.22 above indicated that a chi-square test of independence was computed comparing the frequencies of teacher resource utilisation and students' academic performance in public secondary schools in Makueni County. A significant interaction was found ( $X^2 (12) = 46.01, p < 0.05$ ). If the p-value achieved is less than 0.05, the null hypothesis is rejected and inference arrived at that there exists a significant difference. If the p-value is larger than 0.05, a firm decision is made that there does not exist a significant difference. The p value (0.000) is less than the significant level of 0.05. The null hypothesis was rejected and the alternative accepted. Thus, there was a significant influence on teacher resource utilization and students' academic performance in public secondary schools in Makueni County. This implied that students' academic performance in public secondary schools in Makueni County was statistically influenced by utilization of teacher resource.

However, to estimate the level of influence of utilization of teacher resource on student's academic performance, a coefficient of determination was computed using the regression analysis and the result was as shown in Table 4.23.

**Table 4.23: Model Summary on Regression Analysis of Influence of Utilization of Teacher resource on Student's Academic performance**

<b>Model Summary</b>				
<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.789 <sup>a</sup>	.623	.612	.66836

a. Predictors: (Constant), teacher resources

Source: Instruments

The model summary on table 4.23 above revealed that the level of utilization of teacher resource accounted for 62.3%, as signified by coefficient  $R^2 = .623$ , of the

variation in students' academic performance. This finding implied that variation in the level of utilization of teacher resource explains about 62.3% of the variability in students' academic performance. This infers that other factors not studied in this objective contributed to 37.7% of students' academic performance in the county. This therefore meant that there were other factors other than utilization of teachers that contributed to students' academic performance in the county. To check how well the sample data fitted in the regression model, *F* value was obtained. The model summary of ANOVA was shown in Table 4.24 below.

**Table 4.24: Goodness of Fit Summary for influence of utilization of teacher resources**

		ANOVA <sup>a</sup>				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	84.810	5	16.962	20.022	.000 <sup>b</sup>
	Residual	206.707	244	.847		
	Total	291.516	249			

a. Dependent Variable: Academic Performance

b. Predictors: (Constant), utilization of teacher resources

Source: Instruments

The finding on table 4.24 on utilization of teacher resources helped to explain variation on student performance. This was demonstrated by *F* value  $F(5, 244) = 20.022$ ,  $p < .05$  indicating that the model was justifiable for the regression equation. Accordingly,  $R^2$  which was 62.3% was significant. A multiple Regression check was done to examine the influence on utilization of teacher resources on student performance in Makueni County. This was shown in Table 4.25 below.

**Table 4.25: Multiple Regressions on utilization of teacher resources and students' academic performance**

Model		Coefficients				
		Unstandardized		Standardized	t	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
<b>1</b>	(Constant)	3.024	.297		10.170	.000
	Teacher A	.393	.123	.466	3.179	.002
	Teacher B	-.192	.179	-.221	-1.073	.285
	Teacher C	.372	.095	.419	3.907	.000
	Teacher D	-.202	.112	-.234	-1.810	.072
	Teacher E	.116	.124	.141	.938	.349
	Teacher F	.027	.163	.032	.164	.870
	Teacher G	.098	.166	.121	.591	.555
	Teacher H	-.023	.094	-.025	-.247	.805
	Teacher I	-.142	.124	-.168	-1.147	.252
	Teacher J	.253	.071	.281	3.556	.000

**a.** Dependent variable

Source: Instruments

The standard beta coefficients in Table 4.25 above indicated that utilization of teacher A explained 46.6% of variation in student performance holding the other factors constant. Utilization of teacher B explained 22.1% of variation in student performance holding the other factor constant. Utilization of teacher C explained 41.9% of variation in student performance holding the other factors constant. Utilization of teacher D explained 23.4% of variation in student performance holding the other factors constant. Utilization of teacher E explained 14.1% of variation in student performance holding the other factors constant. Utilization of teacher F explained 3.2% of variation in student performance holding the other

factors constant. Utilization of teacher G explained 12.1 % of variation in student performance holding the other factors constant. Utilization of teacher H explained 2.5% of variation in student performance holding the other factors constant. Utilization of teacher I explained 16.8% of variation in student performance holding the other factors constant. Utilization of teacher J explained 21.8% of variation in student performance holding the other factors constant.

The findings further indicated that, When the utilization of teacher A improved by 1 unit, the academic performance (Y) increased by 3.417 units (3.024+0.393). When the utilization of teacher B improved by 1 unit, the academic performance (Y) increased by 2.832 units (3.024-0.192). When the utilization of teacher C improved by 1 unit, the academic performance (Y) increased by 3.396 units (3.024+0.372). When the utilization of teacher D improved by 1 unit, the academic performance (Y) increased by 3.417 units (3.024+0.393). When the utilization of teacher E improved by 1 unit, the academic performance (Y) increased by 2.822 units (3.024-0.202). When the utilization of teacher F improved by 1 unit, the academic performance (Y) increased by 3.14 units (3.024+0.116). When the utilization of teacher G improved by 1 unit, the academic performance (Y) increased by 3.051 units (3.024+0.027). When the utilization of teacher H improved by 1 unit, the academic performance (Y) increased by 3.122 units (3.024+0.098). When the utilization of teacher I improved by 1 unit, the academic performance (Y) increased by 3.001 units (3.024-0.023). When the utilization of teacher J improved by 1 unit, the academic performance (Y) increased by 3.277 units (3.024+0.253). It is important for teachers in secondary schools to update and improve on their skills and knowledge on utilisation for better students' success in secondary schools in Makueni County.

This study is adopted Education on Production Function theory by (Bowles 1970) which relates school inputs to the measure of outputs produced in terms of test scores. The theory explains how the students' academic performance is dependent on utilisation of the teacher resources. The variables here include utilisation of teacher resources and the students' academic performance which are related to the amount and quality of teachers and teaching services, the physical facilities and instructional materials of the school and the period the student is exposed to these inputs. In the model, a certain transformation takes place in schools, that by using the teacher resource through certain processes and activities in teaching and learning, an achievement on academic results was achieved. From the results of hypothesis 3, utilisation of teacher resources had a positive influence on students' academic performance. A significant interaction was found ( $X^2 (12) = 46.01, p < 0.05$ ). That there was significant influence on teacher resource utilisation and students' academic performance in public secondary schools in Makueni County. Therefore, teacher resource utilisation enhances students' academic performance in public secondary schools in the county. This finding concurs with Kabazira (2010) who did a study on utilization of instructors and learners' academic scores in secondary schools in Kabarole District, Uganda, using cross-sectional survey design, and established that classes which had many students and the schools were understaffed, produced students with poor academic grades.

#### **4.7 Instructional Materials Utilisation and Its Influence on Students' Academic Performance**

The fourth objective of the study was to determine utilisation of instructional resources and its influence on students' academic performance. Information was collected from principals and teachers on utilisation of instructional resources

The fourth objective of the study was also investigated by use of research hypothesis four that utilisation of instructional resources had no significant influence on students' academic performance in public secondary schools in Makueni County. Data were collected using questionnaires and document analysis for teachers and interview schedules for principals. Quantitative data were analysed using descriptive statistics such as means, percentages, standard deviation while in inferential statistics, the chi-square, were used in testing the hypothesis and multiple regression used to predict the influence between the independent variables (utilisation of instructional resources) and the dependent variable (students' academic performance). Qualitative data was analysed by using thematic analysis.

##### **4.7.1 Teachers response on utilization of instructional materials**

The study sought to establish utilization of instructional materials and students' academic performance.

The level of utilization of instructional materials among the selected secondary schools was assessed through the use of Likert-itemed questionnaire which helped the respondents to rate the utilization of instructional materials in various subjects. Using the rating on a five-point Likert scale ranging from very highly utilized (5) to very low (1), the level of utilization of instructional materials was gauged per subject. For easy interpretation and applicability in inferential analysis, the

responses were converted into continuous scale ranging from 1 to 5, where higher scores represented very high utilization, and vice versa. Table 4.26 presents the findings on utilization of instructional materials summarized in mean and standard deviation.

**Table 4.26: Response on utilisation of instructional materials**

Utilization of instructional material resources	5		4		3		2		1		Mean	SD Dev.
	N	%	N	%	N	%	N	%	N	%		
Geography maps	103	41.2	55	22	26	10.4	65	26	1	0.4	3.78	1.244
Biology Charts	105	42	55	22	25	10	64	25.6	1	0.4	3.8	1.243
Chemistry charts	101	40.4	58	23.2	24	9.6	65	26	2	0.8	3.76	1.25
Computers	106	42.4	66	26.4	24	9.6	53	21.2	1	0.4	3.89	1.182
Physics Chats	93	37.2	81	32.4	25	10	48	19.2	3	1.2	3.85	1.154
Microscope	46	18.4	110	44	37	14.8	24	9.6	33	13.2	3.45	1.267
Cylinder	75	30	79	31.6	33	13.2	49	19.6	14	5.6	3.61	1.254
Bunsen Burner	93	37.2	81	32.4	25	10	48	19.2	3	1.2	3.85	1.154
Wash bottle	93	37.2	81	32.4	25	10	48	19.2	3	1.2	3.85	1.154
Petri Dish	106	42.4	66	26.4	24	9.6	53	21.2	1	0.4	3.89	1.182
Centrifuge	93	37.2	81	32.4	25	10	48	19.2	3	1.2	3.85	1.154
Thermometer	46	18.4	110	44	37	14.8	24	9.6	33	13.2	3.45	1.267
Weighing scale	75	30	79	31.6	33	13.2	49	19.6	14	5.6	3.61	1.254
Ammeter	93	37.2	81	32.4	25	10	48	19.2	3	1.2	3.85	1.154
Test Tube	46	18.4	110	44	37	14.8	24	9.6	33	13.2	3.45	1.267
Meter rule	46	18.4	110	44	37	14.8	24	9.6	33	13.2	3.45	1.267
Stopwatch	75	30	79	31.6	33	13.2	49	19.6	14	5.6	3.61	1.254
Burette	93	37.2	81	32.4	25	10	48	19.2	3	1.2	3.85	1.154
Beaker	46	18.4	110	44	37	14.8	24	9.6	33	13.2	3.45	1.267
Filter funnel	75	30	79	31.6	33	13.2	49	19.6	14	5.6	3.61	1.254
Pipette	93	37.2	81	32.4	25	10	48	19.2	3	1.2	3.85	1.154
Spatula	106	42.4	66	26.4	24	9.6	53	21.2	1	0.4	3.89	1.182
<b>Overall Mean</b>											<b>3.71</b>	<b>1.214</b>

Source: Instruments

Table 4.26 revealed that although many county secondary schools in Makueni County, had not attained instructional materials-student ratio, majority of them had

fairly strong instructional materials - student ratios, as reflected by an overall mean of 3.71 with a standard deviation of 1.214. This implied that, on average, the instructional materials-students ratio among the sampled schools is slightly below 4:5, meaning that 74.2% of the students had instructional materials which they used in learning. These findings concurred with Khan & Irshadullah (2018) that teachers who had attained training of high standard with particular skills were devoted to their duties and moderately made use of instructional materials. Further, competent and highly successful educators impressed their students and directly influenced their academic performance. Moreover, capable teachers acted as role models to their students, were prompt in attending classes, worked very hard and this contributed to learners achieving good academic grades. This finding also agreed with Lin, Chen & Liu (2017) who ascertained that regular utilisation of digital learning resources improved learners' academic achievement. Regular utilisation of science laboratory led to better academic achievement in subjects like chemistry, biology and physics. Therefore, learners got an opportunity to handle the science equipment themselves attaining the necessary knowledge and skills. This would contribute to desired academic attainment. This finding also concurred with Asogwa, Isiwu, & Ugwuoke (2021) that teaching and learning materials had a positive effect on performance of learners in Fishery in learning institutions, further, girls improved most on the utilisation of teaching and learning resources than boys. Town schools than country-side schools had improved their performance most on regular use of instructional materials in Fishery. Besides, Okeke (2008) and Okeye (2010) agreed that unsatisfactory learners' academic performance in physics was as a result of teacher's teaching approaches and revealed that proper and efficient use of teaching and learning resources were crucial in facilitating acquisition of learning

concepts and enhancing students' academic performance. Use of computers while teaching and learning contributed to improved academic performance of students. This finding was in agreement with Letao & Brandley (2013) that students who used computers daily in their studies attained better academic grades than those who used them weekly or monthly, so computer use influenced students' performance positively. This finding also concurred with Simões, Oliveira & Nunes (2022) that use of computers was of great significance in enhancing positive academic performance of students. This finding had same opinion with Carter, Greenberg & Walker (2017) that learners who frequently made use of computers in classes scored an average mark higher than those who were denied the opportunity to use them while learning.

#### **4.7.2 Principals' response on utilization of the instructional resources**

The study sought to determine Principals' response on utilization of the instructional resources.

This information was assessed from principal's interview and document analysis. A lot of information was collected. One principal said these words;

*Teachers teach well, however, there are some who rarely use some instructional materials, there is a reason, we have unreliable supply of power in our school.*

*There are other resources like the computers which teacher do not frequently use well in teaching, when we received them, we had a computer teacher and by then, we were offering the subject, but the teacher was transferred and since that time we didn't get another one so we kept them in store. (Principal- 26).*

Another principal also narrated these words;

*Some instructional resources are not frequently used although most of my teachers are trying very hard to use them, why, because of the shortened time after the corona pandemic and all these other emerging issues, we rush to cover the syllabus so that we can start revision. Other important resources are available but some are not adequate, so teachers cannot use them with half of the class (Principal-28).*

From the principal's interview, another principal said this;

*Despite some of the instructional materials being available, we are very much understaffed and this affects the way teachers use the teaching and learning materials especially for the science related subjects. If we have three streams and few chemistry and physics teachers for all those classes how can effective teaching by doing practical be thoroughly done, so, they do a few of them, Principal-14).*

This information implied that underutilization of some of the instructional materials especially chemistry and physics laboratory equipment was witnessed, Utilization of these equipment was vital in the achievement of the science concepts. A study done by Bello (2012) had the same opinion that many students who were unsuccessful in Human Biology examination was as a result of limited utilization or improper utilization of the available school facilities by educators of the subject. Further, professional development courses helped to enhance knowledge and skills on utilization of instructional materials. Ordu &Amadi (2019) also agreed that proper use of print materials, drawings, pictures, watercolours, sketches diagrams as teaching and learning materials contributed to good performance of students, further, effective utilisation of digital learning resources influenced the learner achievement in a positive way. The implication here was instructional materials were moderately

used, leading to low learners academic grades in public county secondary schools. The findings agreed with (Gamoran, Secada and Marrett 2006) that what contributed most to improved learner grades was not the availing of resources, but their quality and how effectively and efficiently they are put into utilisation.

#### **4.7.3 Influence of Utilization of Instructional Materials and Students' Academic Performance in Public Secondary Schools in Makueni County**

H04. *Utilization of instructional materials had no significant influence on students' academic performance in public secondary schools in Makueni County.*

The Research Objective 4 was to determine utilization of instructional materials and students' academic performance in public secondary schools in Makueni County. For this null hypothesis to be investigated a Chi-square ( $\chi^2$ ) test was used, at 0.05 level of significance and at 1 degree of freedom. The findings are presented on the table below.

**Table 4.27: Results of hypothesis 4**

	<b>Hypothesis</b>	<b>Chi-sq. value</b>	<b>df</b>	<b>Chi-square p- value</b>	<b>Sig. Value</b>	<b>Result</b>	<b>Decision</b>
Utilization of instructional materials	H04	19.75	10	0.032	0.05	0.000<0.05	H04: rejected

Source: Instruments

From the table 4.27 above showed that a chi-square test of independence was computed comparing the frequencies of utilisation of instructional materials and students' academic performance in public secondary schools in Makueni County. A significant interaction was found ( $X^2 (10) =19.75, p<0.05$ ). This implies that

utilization of instructional materials affected students' academic performance in public secondary schools in Makueni County. Therefore, the null hypothesis was rejected and alternative hypothesis accepted that there was significant influence on utilization of instructional materials and students' academic performance in Makueni County public secondary schools.

However, to estimate the level of influence of utilization of instructional materials on student's academic performance, a coefficient of determination was computed using the regression analysis and the result was as shown in Table 4.28.

**Table 4.28: Model Summary on Regression Analysis of Influence of Utilization of Instructional materials on Student's Academic performance**

<b>Model Summary</b>			
<b>Model</b>	<b>R</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
<b>1</b>	.248 <sup>a</sup>	.007	1.06905

Predictors: (Constant), instructional materials

Source: Instruments

Table 4.28 above showed the model summary which reveals that the level of utilization of instructional materials accounted for 6.1%, as signified by coefficient  $R^2 = .061$ , of the variation in students' academic performance. This finding implied that variation in the level of utilization of instructional materials explained about 6.1% of the variability in students' academic performance. This infers that other factors not studied in this objective contributed to 93.9% of students' academic performance in the county. This therefore meant that there were other factors other than utilization of instructional materials that contribute to students' academic performance in the county. To check how well the sample data fitted in the

regression model,  $F$  value was obtained. The model summary of ANOVA was shown in Table 4.29 below.

**Table 4.29: Goodness of Fit Summary for influence of utilisation of instructional materials**

		ANOVA <sup>a</sup>				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	140.446	21	6.688	28.221	.000 <sup>b</sup>
	Residual	15.167	64	.237		
	<b>Total</b>	<b>155.613</b>	<b>85</b>			

Dependent Variable: School mean in 2022 KCSE

Predictors: (Constant), instructional materials

Source: Instruments

**Table 4.30: Multiple Regressions on utilization of instructional materials and students' academic performance**

Model		Coefficients <sup>a</sup>		Standardized Coefficients Beta	t	Sig.
		Unstandardized Coefficients B	Std. Error			
1	(Constant)	5.209	.833		6.255	.000
	Geography maps Ratio	-.045	.177	-.052	-.254	.800
	Biology charts Ratio	-.167	.327	-.165	-.511	.610
	Chemistry charts Ratio	-.692	.442	-.716	-1.565	.119
	Computer Ratio	.748	.413	.806	1.811	.072
	Physics Chats Ratio	.373	.168	.431	2.215	.028
	Microscope Ratio	-.223	.173	-.219	-1.290	.199
	Cylinder Ratio	-.129	.291	-.114	-.444	.657
	Bunsen Burner Ratio	.299	.433	.253	.690	.491
	Wash bottle Ratio	-.012	.200	-.011	-.061	.951
	Petri Dish Ratio	-.087	.220	-.071	-.392	.695
	Thermometer Ratio	-.114	.292	-.098	-.390	.697
	Weighing scale Ratio	-.014	.175	-.017	-.081	.935
	Ammeter Ratio	.298	.307	.318	.970	.333
	Test-tube Ratio	.430	.429	.474	1.001	.318
	Meter rule Ratio	-.557	.435	-.640	-1.281	.202
	Stopwatch Ratio	-.404	.201	-.470	-2.012	.046
	Burette Ratio	.267	.167	.251	1.601	.111
	Beaker Ratio	.189	.321	.138	.589	.556
	Filter funnel Ratio	-.552	.476	-.431	-1.160	.248
	Pipette Ratio	-.142	.259	-.136	-.548	.584
	Spatula Ratio	.334	.282	.213	1.182	.239
	Evaporation dish Ratio	.084	.237	.095	.354	.723

Dependent Variable: School mean in 2022 KCSE

Source: Instruments

The standard beta coefficients in Table 4.30 above indicated that utilization of Geography maps explained 5.2% of variation in student performance holding the other factors constant. Utilization of Biology charts explained 16.5% of variation in

student performance holding the other factors constant. Utilization of computers explained 80.6% of variation in student performance holding the other factors constant. Utilization of Bunsen burner explained 25.3% of variation in student performance holding the other factors constant. Utilization of Thermometers explained 9.8% of variation in student performance holding the other factors constant. Utilization of Beakers explained 13.8% of variation in student performance holding the other factors constant. Utilization of spatula explained 21.3% of variation in student performance holding the other factors constant. Utilization of Evaporation dish explained 9.5% of variation in student performance holding the other factors constant.

From the table 4.30 above, it could be deduced that when utilization of Geography maps was increased by one unit, the academic performance (Y) increased by  $(5.209 - 0.045)$  5.164. When utilization of Biology charts was increased by 1 unit the academic performance (Y) increased by  $(5.209 - 0.167)$  5.042. When utilization of computers was increased by 1 unit the academic performance (Y) increased by  $(5.209 + 0.748)$  5.957. When utilization of Bunsen burner was increased by 1 unit the academic performance (Y) increased by  $(5.209 + 0.299)$  5.508. When utilization of thermometers was increased by 1 unit the academic performance (Y) increased by  $(5.209 - 0.144)$  5.353. When utilization of beaker was increased by 1 unit the academic performance (Y) increased by  $(5.209 + 0.189)$  5.398. When utilization of spatula was increased by 1 unit the academic performance (Y) increased by  $(5.209 + 0.334)$  5.453. When utilization of evaporation dish was increased by 1 unit the academic performance (Y) increased by  $(5.209 + 0.084)$  5.293. Thus, there was need to embrace the utilization of instructional materials if students' academic performance was to improve.

This study adopted Education on Production Function theory by (Bowles 1970) which relates school inputs to the measure of outputs produced in terms of test scores. The theory explains how the students' academic performance was dependent on utilisation of the instructional materials. The variables here include utilisation of instructional materials and the students' academic performance which are related to the amount and quality of teachers and teaching services, the physical facilities and instructional materials of the school and the period of time the student was exposed to these inputs. In the model, a certain transformation takes place in schools, that by using the available school resource through certain processes and activities of teaching and learning, an achievement on academic results was achieved. Results of hypothesis four revealed that utilisation of instructional materials influenced students' academic performance. A significant interaction was found ( $X^2(10) = 19.75, p < 0.05$ ). This implies that there was significant relationship between utilisation of instructional materials and students' academic performance in public secondary schools in Makueni County. Thus, utilisation of instructional materials influenced students' academic performance in public secondary schools in the county.

**Table 4.31: Summary of the Multiple Regression equation**

	<b>Factor</b>	<b>Mean coefficient</b>
<b>X<sub>1</sub></b>	Text book utilization	0.099
<b>X<sub>2</sub></b>	Infrastructure utilization	0.018
<b>X<sub>3</sub></b>	Teacher utilization	0.07
<b>X<sub>4</sub></b>	Instructional material utilization	-0.005
	<b>Mean constant</b>	<b>3.048</b>

Source: Instruments

Table 4.31 above showed the Summary of the multiple regression equation of the four independent variables on the dependent variable.

$$Y=0.099X_1 + 0.018X_2 +0.07X_3 -0.005X_4 +3.048$$

The Summary of the Multiple Regression equation which showed that when the textbook utilization (x1) increased by 1 unit, the academic performance (Y) increased by 3.147 units (3.048+0.099). When the utilization of infrastructure (x2) increased by 1 unit, the academic performance (Y) increased by 3.066 units (3.048+0.018). When the utilization of teachers(x3) increased by 1 unit, the academic performance (Y) increased by 3.118 units (3.048+0.07) When the utilization of instructional materials (x4) increased by 1 unit, the academic performance (Y) increased by 3.043 units (3.048-0.005). It is important to improve on utilization of instructional resources in order to enhance students' academic scores.

## **CHAPTER FIVE**

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

#### **5.1 Introduction**

This chapter shows the summary, conclusions and recommendations as according to objectives and research hypotheses. It presents the summary of the judgments drawn from discussions and conclusions derived from the study findings. The study investigated the influence of institutional resource utilisation on academic performance in public secondary schools in Makueni County. This chapter also presents the recommendations for policy and practice obtained from the study findings and suggestions for further research.

The study was done to determine the influence of institutional resource utilisation on academic performance in public secondary schools in Makueni County. The following objectives were addressed; to determine the utilisation of textbooks and its influence on students' academic performance in public secondary schools in Makueni County; to establish the utilisation of school infrastructure and its influence on students' academic performance; to determine the influence of utilization of teacher resources on students' academic performance and lastly, to determine the influence of utilization of instructional materials and students' academic performance in public secondary schools in Makueni County.

#### **5.2 Summary of the Findings of the Study**

The study respondents included principals and teachers from the 30 sampled secondary schools. To address the objectives of the study, data were collected from an interview schedule from 30 principals and document analysis and questionnaires from 286 HoDs/teachers. The quantitative data were analysed using descriptive and

inferential statistics using SPSS version 26 and qualitative data organised into themes which became the categories of analysis. The findings were presented in graphs, tables verbatim and narratives. The research study adopted mixed methods, specifically convergent parallel research design, which formed the structure and frame to respond to the study objectives and the entire study.

### **5.2.1 The utilisation of textbooks and its influence on students' academic performance**

The study sought to determine utilisation of textbooks and its influence on the students' academic performance in Makueni County. The summary of the findings of the study are presented according to the objectives. The findings revealed that majority of the study respondents agreed that there is high utilization of textbooks in county secondary schools with a Mean 4.06, SD=1.046). This is from the teachers responses. According to the Likert scale rating, a mean of 1.0-2.9 is termed as low, 3-3.9 is rated as moderate, 4.0-5.0 is high, and a mean of 3.5-5.0 is termed as high. Therefore, a mean of 4.06 is high in utilisation of textbooks among the candidates in county secondary school in Makueni County. Utilization of textbooks had a strong positive significant relationship with students' performance ( $X^2 (10) =31.90$ ,  $p<0.05$ ). The R square value of 0.664 represents a simple correlation. It indicated a relatively strong degree of correlation. The adjusted R Square value of 0.650 indicated how much of the dependent variable, "students' performance", could be explained by utilization of textbooks. In this case 66.4% of student's performance variability could be explained to be as a result of utilization of textbooks in public county secondary school in Makueni County. The R square and adjusted R squared had minimal difference, implying that utilization of textbooks resources predicated

students' performance. That meant that 33.6% of the variation in student performance could not be explained by utilization of textbooks. This infers that other factors other than utilization of textbooks resources influenced the academic performance of the students in the county. Hypothesis 1 which stated that utilization of textbooks resources had no significant influence on students' academic performance in public secondary schools in Makueni County, was tested using chi-square ( $\chi^2$ ) test at 0.05 significant level at 1 degree of freedom. The results revealed that a significant interaction was found ( $(X^2 (10) = 31.90, p < 0.05)$ ), the p-value (0.000) was less than 0.05, therefore the null hypothesis was rejected and the alternative hypothesis accepted that there was a positive significant influence on utilization of textbooks resources and students' academic performance. Thematic analysis indicated that there was high utilization of textbooks in public secondary schools in Makueni County.

### **5.2.2 The Utilisation of School Infrastructure and its Influence on Students' Academic Performance**

The findings revealed that majority of the study respondents agreed that there is moderate utilization of school infrastructure in county secondary schools with a Mean 3.86, SD=1.146). This was from the teachers responses. According to the Likert scale rating, a mean of 1.0-2.9 is termed as low, 3-3.9 is rated as moderate, and a mean of 4.0-5.0 is termed high. Therefore, a mean of 3.86 was moderate in utilisation of school infrastructure among the candidates in county secondary school in Makueni County. Utilization of school infrastructure had weak positive significant relationship with students' performance ( $(X^2 (5) = 201.67, p < 0.05)$ ). The R square value of 0.287 represents a simple correlation. It indicated a relatively weak

degree of correlation. The adjusted R Square value of 0.261 indicated how much of the dependent variable, 'students' performance', could be explained by utilization of school infrastructure. In this case 28.7% of student's performance variability could be explained to be as a result of utilization of school infrastructure in public county secondary school in Makueni County. The R square and adjusted R squared had minimal difference, implying that utilization of school infrastructure resources predicated students' performance. That meant that 71.3% of the variation in student performance could not be explained by utilization of school infrastructure. This infers that other factors other than utilization of school infrastructure resources influenced the academic performance of the students in the county. Hypothesis 2 which stated that utilization of school infrastructure resources had no significant influence on students' academic performance in public secondary schools in Makueni County, was tested using chi-square ( $\chi^2$ ) test at 0.05 significant level at 1degree of freedom. The results revealed that a significant interaction was found ( $(\chi^2 (5) =201.67, p<0.05)$ ), the p-value (0.000) was less than 0.05 therefore the null hypothesis was rejected and the alternative hypothesis accepted that there was a significant positive influence of utilization of school infrastructure resources and students' academic performance. Thematic analysis indicated that there was moderate utilization of school infrastructure in public secondary schools in Makueni County.

### **5.2.3 The Utilization of Teacher Resources and its Influence on Students' Academic Performance**

The findings revealed that majority of the study respondents agreed that there is high utilization of teacher resources in county secondary schools with a Mean 3.68, SD=1.220). This is from the teachers responses. According to the Likert scale rating, a mean of 1.0-2.9 is termed as low, 3-3.9 is rated as moderate, and a mean of 4.0-5.0 is term high. Therefore, a mean of 3.68 is moderate in utilisation of teacher resources among the candidates in county secondary school in Makueni County. Utilization of teacher resources had a strong positive significant relationship with students' performance ( $\chi^2 (12) =46.1, p<0.05$ ). The R square value of 0.62.3 represents a simple correlation. It indicated a relatively strong degree of correlation. The adjusted R Square value of 0.612 indicated how much of the dependent variable, "students' performance", could be explained by utilization of teacher resources. In this case 62.3% of student's performance variability could be explained to be as a result of utilization of teacher resources in public county secondary school in Makueni County. The R square and adjusted R squared had minimal difference, implying that utilization of textbooks resources predicated students' performance. That meant that 37.7% of the variation in student performance could not be explained by utilization of teacher resources. This infers that other factors other than utilization of teacher resources influenced the academic performance of the students in the county. Hypothesis 3 which stated that utilization of teacher resources had no significant influence on students' academic performance in public secondary schools in Makueni County, was tested using chi-square ( $\chi^2$ ) test at 0.05 significant level at 1degree of freedom. The results revealed that a significant interaction was found ( $\chi^2 (12) =46.1, p<0.05$ ), the p-value (0.000) was less than

0.05 therefore the null hypothesis was rejected and the alternative hypothesis accepted that there was a significant positive influence of utilization of teacher resources and students' academic performance. Thematic analysis indicated that there was moderate utilization of teacher resources in public secondary schools in Makueni County.

#### **5.2.4 Utilization of Instructional Materials and its Influence on Students' Academic Performance**

The findings revealed that majority of the study respondents agreed that there was moderate utilization of instructional in county secondary schools with a Mean 3.71, SD=1.214). This was from the teachers responses. According to the Likert scale rating, a mean of 1.0-2.9 was termed as low, 3-3.9 is rated as moderate, and a mean 4.0-5.0 is termed as high. Therefore, a mean of 3.71 was termed as moderate in utilisation of instructional materials among the candidates in county secondary school in Makueni County. Utilization of instructional materials had a positive influence on students' performance ( $\chi^2 (10) = 19.75, p < 0.05$ ). The R square value of 0.061 represents a simple correlation. It indicated a relatively weak degree of correlation. The adjusted R Square value of 0.007 indicated how much of the dependent variable, "students' performance", could be explained by utilization of instructional materials. In this case 6.7% of student's performance variability could be explained to be as a result of utilization of instructional materials in public county secondary school in Makueni County. The R square and adjusted R squared had minimal difference, implying that utilization of instructional materials predicated students' performance. That meant that 93.3% of the variation in student performance could not be explained by utilization of instructional materials. This

infers that other factors other than utilization of instructional materials influenced the academic performance of the students in the county. Hypothesis 4 which stated that utilization of instructional materials had no significant influence on students' academic performance in public secondary schools in Makueni County, was tested using chi-square ( $\chi^2$ ) test at 0.05 significant level at 1 degree of freedom. The results revealed weak significant interaction was found ( $(\chi^2 (10) = 19.75, p < 0.05)$ ), the p-value (0.000) was less than 0.05 therefore the null hypothesis was rejected and the alternative hypothesis accepted that utilization of instructional materials had no significant influence on students' academic performance. Thematic analysis indicated that there was moderate utilization of instructional materials in public secondary schools in Makueni County.

### **5.3 Conclusion of the Study**

From the summary of the findings found out in the foregoing study, the following conclusions were deduced as per the objectives.

#### **5.3.1 The Utilisation of Textbooks Resources and its Influence on Students' Academic Performance**

The findings confirmed that utilisation of textbooks in public secondary schools in Makueni County had a statistically significant influence on students' performance. The conclusion is that textbooks are highly utilised in county secondary schools. This was deduced by both teachers and principals in county secondary schools in Makueni County.

### **5.3.2 The Utilisation of School Infrastructure and its Influence on Students' Academic Performance**

The findings confirmed that utilisation of school infrastructure in public secondary schools in Makueni County had a statistically significant influence on students' performance. The conclusion was that utilisation of school infrastructure was moderate in county secondary schools in Makueni County.

### **5.3.3 The Utilization of Teacher Resources and its Influence on Students' Academic Performance**

The findings confirmed that utilization of teacher resources in public secondary schools in Makueni County had a statistically significant influence on students' performance. The conclusion was that utilization of teacher resources was high in public secondary schools in Makueni County. This was concluded by both teachers and principals.

### **5.3.4 Utilization of Instructional Materials and Its Influence on Students' Academic Performance**

The findings indicated that utilization of instructional materials in public secondary schools in Makueni County had a statistically significant influence on students' performance. The conclusion was that instructional materials are moderately utilized in public secondary schools in Makueni County. This conclusion was meant by both teachers and principals.

#### **5.4 Recommendations for Policy and Practice**

In this section recommendations are made according to the findings and conclusions from the analysis of the data collected in the study, the following recommendations are suggested:

- i. Though textbooks are highly utilised, there was need for donors, corporates and the Ministry (MoE) to devise more ways to improve utilisation of the available textbooks for the purpose of improving performance at KCSE in public secondary schools in Makueni County.
- ii. School infrastructure has been moderately utilised, and it was important for international bodies like GPE (Global Partnership for Education) together with MoE to improve and increase school buildings in order to enhance utilization and improve students' learning outcomes.
- iii. Although teachers were highly utilised, it was necessary for teachers to be given advanced training to increase effectiveness on implementation of the curriculum and the improve the quality of education.
- iv. There was need for principals to ensure effective utilization of teacher resources in public secondary schools and improve students' inclusion and learning.
- v. It was important for public secondary schools teachers to ensure frequent utilization of instructional materials so that students can improve at KCSE performance.

#### **5.4.1 Recommendations for Further Research**

- i) A similar study to be conducted on utilisation of school infrastructure resources in private schools to investigate the same objectives.
- ii) Another study should be done on utilisation of instructional materials as the findings showed moderate utilization and compare the findings.
- iii) A different study should be done on utilisation of different variables versus students' academic performance.

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## APPENDICES

### APPENDIX 1

#### QUESTIONNAIRE FOR TEACHERS

This questionnaire will seek information regarding institutional resource utilisation and students' academic performance in secondary schools in Makueni County. Please fill or tick (✓) them appropriately. The purpose of this study will be purely for this academic research. Please do not write your name or give personal information.

#### SECTION A: Demographic Information

1. What is your gender?

Male      [   ]                  Female      [   ]

2. What is your age bracket in years?

Under 30              [   ]

31-35                  [   ]

36-40                  [   ]

41-45                  [   ]

Over 46                [   ]

3. Please state your highest level of education

Diploma                      [   ]

Bachelor's Degree            [   ]

Masters                      [   ]

PhD                            [   ]

Postgraduate Diploma      [   ]

Others                        [   ]

If others, specify .....

4. Please state your teaching experience?

Below 5 years            [   ]

6-10                        [   ]

11-15                      [   ]

16-20                      [   ]

Above 21 years          [   ]

**SECTION B: Influence of utilisation of textbooks and students' academic performance.**

5. This section contains questions used to solicit information on utilisation of textbooks and students' academic performance. The following textbooks are used when teaching in my school. Please rate the level of utilization of textbooks (**within a week**) and tick as appropriate (✓), using a Likert Scale 1-5, 5-very high and 1-very low. 5- Very high = 5, High = 4, Moderate = 3, Low = 2, Very Low = 1. 5-highest (5:5), 1-lowest (1:5).

Statements on utilisation of textbooks	Rate the ratio of books to students in the scale 1-5. 5-highest (5:5), 1-lowest (1:5).					No. of text books (candidates only)	No. of students currently using	Mean score in the subject in 2022 KCSE
	(VH)5	(H)4	(M)3	(L)2	(VL)1			
English textbook 4								
Literature set book								
Kiswahili textbook 4								
Fasihi set book								
Mathematics textbook 4								
Chemistry textbook 4								
Biology textbook 4								
Physics textbook 4								
C.R.E textbook 4								
History & government textbook 4								
Geography textbook 4								
Business studies textbook 4								
Agriculture textbook 4								

**SECTION C: Influence of utilisation of school infrastructure and students' academic performance.**

6. This section contains questions used to solicit information on utilisation of school infrastructure and students' academic performance. The following buildings are utilised in my school. Please rate the rate the level of utilization of school infrastructure (**within a week**) and tick as appropriate (✓), in the Likert scale 1-5. 5-very high and 1- very low. 5- Very high = 5, High = 4, Moderate = 3, Low = 2, Very Low = 1. 5-highest (5:5), 1-lowest (1:5).

Statements on utilisation of school infrastructure	(VH)5	(H)4	(M)3	(L)2	(VL)1	Size of the rooms e.g. 6m by 8m for classroom	No. of the rooms used by form 4s only e.g., classes are 4	No. of form 4s currently using one class
Classrooms								
<b>Science laboratories</b>								
Chemistry lab								
Biology lab								
Physics lab								
School Library								
Computer laboratory								

**SECTION D: Influence of utilisation of teacher resources and students' academic performance**

7. This section contains questions used to solicit information on utilisation of teacher resources and students' academic performance. The following teachers are utilised in my school. Please rate the level of utilization of teachers and tick as appropriate (✓), using a Likert Scale 1-5, where 5-Very high and 1-very low. (Always)A-5, (Many times) S-4, (Moderate) N-3, (Rarely) R-2, (Never) N-1.

Rate the level of syllabus covering in the Likert scale 1-5. 5-Very high, 1-very low. 5-highest (5:5), 1-lowest (1:5).	(A) 5	(MT) 4	(M)3	(R) 2	(N) 1	State the exact time spent by teachers in class e.g. 32/40 or 70/80 double lesson
Teacher A						
Teacher B						
Teacher C						
Teacher D						
Teacher E						
Teacher F						
Teacher G						
Teacher H						
Teacher I						
Teacher J						

1. Total number of teachers in your school .....
2. Total number of students.....
3. Total number of candidates.....
4. School mean in 2022 KCSE.....
5. Rate the ratio of teachers to students in the scale 1-5. 5-highest (1:10), 1-lowest (1:50).
6. Do you complete the syllabus per class one month before the set time? Yes/No
7. Do you attend the allocated classes on time? Yes/No
8. Number of teachers who have achieved the set subject targets -
9. Number of teachers who have **not** achieved the set subject targets –

**SECTION E: Influence of utilisation of instructional materials and students' Academic performance.**

8. This section contains questions used to solicit information on utilization of instructional materials and students' academic performance. The following instructional materials are used in my school. Please tick as appropriate (√), using a Likert Scale 1-5, where 5-very high and 1- very low. 5- Very high = 5, High = 4, Moderate = 3, Low = 2, Very Low = 1, 5-highest (5:5), 1-lowest (1:5).

<b>Statements on utilisation of the instructional materials in schools</b>	<b>(VH)5</b>	<b>(H)4</b>	<b>(M)3</b>	<b>(L)2</b>	<b>(VL)1</b>	<b>No. of the instructional material e.g. 5 Geo maps</b>	<b>No. of students in that class e.g. using Geo. wall maps</b>
Use of Geography wall maps.							
Utilization of Biology wall charts/diagrams							
Use of chemistry charts							
Use of physics flow-chart diagrams							
Utilisation of computers							
Using science equipment; for Biology							
i). Microscope,							
ii). Graduated cylinder							
iii). Bunsen burner							

Statements on utilisation of the instructional materials in schools	(VH)5	(H)4	(M)3	(L)2	(VL)1	No. of the instructional material e.g. 5 Geo maps	No. of students in that class e.g. using Geo. wall maps
iv). Wash bottle							
vi) Centrifuge							
Using science equipment; for physics vii) Thermometer							
viii) Weighing scale							
ix) Ammeter							
x). Test-tube							
xi) Meter rule							
xii) Stop watch							
Using science equipment; For Chemistry xiii) Burette							
xiv) Beaker							
xv) Filter funnel							
xvi) Pipette							
xvii) Spatula							
xviii) Evaporation dish							

***Thank you for your participation, be blessed.***

## APPENDIX 2

### INTERVIEW SCHEDULE FOR THE PRINCIPAL

The interview schedule will be used to collect information on utilisation of institutional resources and students’ academic performance in secondary schools in Makueni County. The purpose of this study will be purely for this academic research. Please give the right information. Do not give your name or personal information.

#### SECTION A: Demographic Information

1. Please tell me about yourself; age, .....
2. Education level? .....
3. Teaching experience? .....
4. The number of years you have been in this school? .....
5. Briefly explain the KCSE academic performance of your school since 2016 to 2020?

Year	2016	2017	2018	2019	2020	Aggregate grade/mark
Mean score						
Grade						

6. Please, state according to your opinion why the students performed the way they did in the KCSE academic performance of your school since 2016 to 2020?
  - a).....
  - b).....
7. How is the general academic performance of your school? In your response please talk briefly about the
  - a) Opener examinations .....
  - b) End of term three examination mean score .....
  - c) KCSE results from 2016 to 2020 .....
  - d) KCSE results for 2022.....
  - e)Number of teachers .....
  - f) Categories of teachers.....
8. Please tell me about the school enrollment for the last 5 years?  
 2017 [ ]    2018 [ ]    2019 [ ]    2020 [ ]    2021 [ ]

**SECTION B; Influence of utilization of institutional resources on students' academic performance**

This section contains questions used to solicit information about utilization of institutional resources and students' academic performance.

1. How are textbooks used?.....
2. What is the ratio of textbook to student sharing.....
3. In which ways are classrooms utilised?.....
4. What is the ratio of classroom to student sharing ?.....
5. What are the measurements of your classroom?.....
6. How is your science laboratory equipped.....
7. What is the ratio of science laboratory to student sharing.....
8. How is the science laboratory used.....
9. What are the measurements of your science laboratory.....
10. How is the library equipped?.....
11. What is the ratio of library to student sharing?.....
12. What are the measurements of your school library?.....
13. How is the school library made use of?.....
14. What is the ratio of computer lab to student sharing?.....
15. What are the measurements of your computer lab?.....
16. How is the computer utilised?.....
17. How is your science laboratory equipped.....
18. How are teachers used?.....
19. What is the ratio of teacher to student sharing?.....
20. Do teachers attend to classes as planned?.....
21. How do teachers spent their time in class?.....
22. Do they complete the syllabus as per school deadlines?.....
23. What is relationship between syllabus completion by teachers and academic performance?.....
24. How do teachers use instructional materials?.....
25. What is the ratio of geography wall maps to student sharing?.....
26. What is the ratio of computers to student sharing?.....
27. What is the ratio of microscopes to student sharing?.....
28. What is the link between instructional materials utilization and academic performance?.....

***Thank you for your participation, BE BLESSED***

### APPENDIX 3

#### DOCUMENT ANALYSIS

The study sought to establish the information on the number of teachers, students and students' academic performance from KNEC in county secondary schools

No	Type of document	Document date	Retrieved from	Retrieved date	Completed date	Date coded	Other notes
1	KCSE results						
2	Record of teachers						
3	Categories of teachers						
4	Record of students						
5	Number of school buildings						
6	Types of school buildings						

## APPENDIX 4

### INTRODUCTION LETTER

Kenyatta University  
P O Box 43844-00100  
Nairobi, Kenya.  
Cell Phone No: +254 20 870 Ext 3070/3073  
Email Address: info@ku.ac.ke

Dear Principal,

#### **RE: EDUCATIONAL DATA COLLECTION**

I am a PhD student in Educational Management, Policy and Curriculum Studies Course at the Kenyatta University. I am carrying out a research on institutional resource utilization and students' academic performance. I will appreciate if you kindly help complete the attached questionnaires. The information on the questionnaire will only be for the purpose of this academic research. Your identity will remain anonymous and therefore do not write your name anywhere in the questionnaires.

Thank you.

Yours faithfully,



Agnetta Mwikali Peter.

## APPENDIX 5

### APPROVAL OF RESEARCH PROPOSAL



KENYATTA UNIVERSITY  
GRADUATE SCHOOL

E-mail: [kubps@yahoo.com](mailto:kubps@yahoo.com)  
[dean-graduate@ku.ac.ke](mailto:dean-graduate@ku.ac.ke)  
Website: [www.ku.ac.ke](http://www.ku.ac.ke)

P.O. Box 43844, 00100  
NAIROBI, KENYA  
Tel. 810901 Ext. 57530

#### Internal Memo

FROM: Dean, Graduate School

DATE: 4<sup>th</sup> June, 2021

TO: Ms. Agnetta M. Peter  
C/o Department Euc. Mngt. Policy & Curr. Studies  
KENYATTA UNIVERSITY

REF: ES3/CE/26220/14

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

This is to inform you that the Graduate School Board at its meeting 2<sup>nd</sup> June, 2021 approved your Ph.D. Research Proposal entitled "Influence of Selected Institutional Resource Utilization on Academic Performance in Public Secondary Schools in Makueni County, Kenya".

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology & Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed supervision Tracking and Progress Report Forms. The Forms are available at the University's Website under Graduate School webpage downloads.

By copy of this letter, the Registrar (Academic) is hereby requested to grant you substantive registration for your Ph.D. studies.

Thank you.

REUBEN MURIUKI  
FÖR: DEAN, GRADUATE SCHOOL

c.c. Chairman, Department of Educ. Mngt. Policy & Curr. Studies  
Registrar (Academic) Att; Mr. Richard Chweya

Supervisors:

1. Dr. Nobert Ogeta  
C/o Department of Educ. Mngt. Policy & Curr. Studies  
KENYATTA UNIVERSITY
2. Dr. Hellen Guantai  
C/o Department of Educ. Mngt. Policy & Curr. Studies  
KENYATTA UNIVERSITY

EM/cáo

## APPENDIX 6

### RESEARCH AUTHORIZATION



KENYATTA UNIVERSITY  
GRADUATE SCHOOL

E-mail: [kubps@yahoo.com](mailto:kubps@yahoo.com)  
[dean-graduate@ku.ac.ke](mailto:dean-graduate@ku.ac.ke)  
Website: [www.ku.ac.ke](http://www.ku.ac.ke)

P.O. Box 43844, 00100  
NAIROBI, KENYA  
Tel. 8710901 Ext. 57530

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Our Ref: E83/CE/26220/14

Date: 4<sup>th</sup> June, 2021

The Director General,  
National Commission for Science, Technology & Innovation,  
P.O. Box 30623-00100,  
**NAIROBI**

Dear Sir/Madam,

---

RE: RESEARCH AUTHORIZATION FOR MS. AGNETTA M. PETER – REG. NO. E83/CE/26220/14

---

I write to introduce Ms. Mwikali who is a Postgraduate Student of this University. She is registered for a Ph.D. degree programme in the Department of Educational Management Policy & Curriculum Studies in the School of Education.

Ms. Mwikali intends to conduct research for Ph.D. thesis entitled, “Influence of Selected Institutional Resource Utilization on Academic Performance in Public Secondary Schools in Makueni County, Kenya”.

Any assistance given will be highly appreciated.


Yours faithfully,




PROF. ELISHIBA KIMANI  
DEAN, GRADUATE SCHOOL

RMM/cao


**APPENDIX 7:**  
**RESEARCH LICENSE**

  
**REPUBLIC OF KENYA**

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

Ref No: **814030** Date of Issue: **02/July/2021**


**RESEARCH LICENSE**




**This is to Certify that Ms. Agneta Mwikali Peter of Kenyatta University, has been licensed to conduct research in Makeni on the topic: INFLUENCE OF SELECTED INSTITUTIONAL RESOURCE UTILIZATION ON ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN MAKUENI COUNTY, KENYA, for the period ending : 02/July/2022.**

License No: **NACOSTI/P/21/11515**

**814030**  
Applicant Identification Number

  
Director General  
**NATIONAL COMMISSION FOR  
SCIENCE, TECHNOLOGY &  
INNOVATION**

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