MEDIATING EEFECT OF RESOURCE UTILIZATION ON THE RELATIONSHIP BETWEEN IMPLEMENTATION LEARNING STRATEGIES AND STUDENTS ACADEMIC PERFORMANCE IN KENYAN PUBLIC UNIVERSITIES

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DECLARATION

Declaration by the Student

This thesis is my original work and has not been presented for the award of any certificate or degree in any other institution or university. No part of this work should be reproduced without prior permission from the author and/or University of Eldoret.

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DEDICATION

This work is dedicated to my loving husband Isaac Kebeney, my children Dennis, Daisy and Alex for their moral support and comfort throughout my study period. Special dedication also goes to my loving parents Mr. and Mrs. Josiah Borborei whose encouragement and psychosocial support did not go unnoticed.

ABSTRACT

Students' academic performance is a major concern in every institution of higher learning be it in the west or in the developing countries and it is the concern of higher education institutions to see that their students perform according to the required standard and a competitive advantage. The study focused on determining the mediating role of resource utilization on the association between implementation of learning strategies and academic performance of students in Kenyan public universities. The objectives of this study were to; determine the effect of student-centred learning, social support, technology innovation and teacher-centred learning on academic performance of students and determine the mediating effects of resource utilization on the relationship between implementation of learning strategies and students' academic performance. The study was guided by three theories; Systems theory, Warlberg's theory and implementation theory. The study adopted an explanatory research design with a target population of 4343 teaching staff from 9 public universities in Kenya. The sample size was 366 lecturers obtained using Taro and Yamane formula. Structured questionnaires were administered to the teaching staff. Cronbach's $\alpha > 0.7$ was used to test reliability of data and validity determined using expert judgement. Data was analyzed using descriptive and inferential statistics using statistical package for social science. The mediation effect of resource utilization on the relationship between implementation of learning strategies and academic performance of students was tested using a special PROCESS Macro tool developed by Hayes (2013). The mediation model results showed $R^2 = 0.4116$ and was significant ($p < 0.000$) an indication that implementation of learning strategies predict 41.16% of student performance. The regression of implementation of learning strategies on student performance, ignoring the mediator, was significant, $\beta = .637$, $t(292) = 14.30$, $p < .000$. The implementation of learning strategies predicts 24.4% of resource utilization. The implementation of learning strategies on the mediator, resource utilization, was significant, $\beta = .798$, $t(292) = 9.71$, $p < .000$. In the mediation model, resource utilization controlling for implementation of learning strategies was significant having predicted 52.22% of student academic performance. The mediation process showed that the mediator (resource utilization), controlling for implementation of learning strategies, was significant, $\beta = .235$, $t(291) = 8.21$, $p < .000$. Finally, controlling for the mediator (resource utilization), implementation of learning strategies scores was a significant predictor of student academic performance, $\beta = .449$, $t(291) = 9.71$, $p < .000$. From the Sobel test there was partial mediation in the model ($z = 6.2497$, $p < .000$). The resource utilization partially mediated the relationship between implementation of learning strategies and academic performance of students in Kenyan public universities. Implementation of learning strategies had significant positive relationship with student performance. Resource utilization partially mediated the relationship between implementation of learning strategies and academic performance of students in Kenyan public universities. Since the implementation of learning strategies predict 41.16% of the student performance, there is need for university management to enhance its implementation of learning strategies approaches in order to improve student performance more. The university management should introduce more strategies geared towards enhancing student performance with respect to the available resources.

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ACRONYMS

SHRM -	Strategic Human Resource Management
HR -	Human Resources
HEIs -	Higher Educational Institutes
MoEST-	Ministry of Education Science and Technology
SCI -	Student- Centred instruction
LCPs -	Learner-Centered Psychological Principles
NRC -	National Research Council
OECD -	Organization for Economic Co-operation and Development
UNESCO -	United Nations Educational Scientific and Cultural Organization
PISA -	Programme for International Student Assessment
KESSP-	Kenya Education Sector Support Programme
WB -	World Bank
SP -	Student Performance
VIF -	Variance Inflation Factors
DHET -	Department of Higher Education and Training
GPA -	Grade Point Average
EIR -	Electronic Information Resource
MDGs -	Millenium Development Goals
US -	United States
UWI -	University of West Indies
USA -	United States of America
RSA -	Republic of South Africa
PhD -	Doctor of Philosophy

OPERATIONAL AND DEFINITION OF TERMS

Resource Utilization

Resource utilization in this study refer to items that affect student performance like for instance learning and teaching resources, human resources, lecture halls, teacher workload and class capacity or size.

Student-Centered Learning

Student-centered learning according to Mercer and Dörnyei (2020) posits that in the process of learning, learners are co-creators, hence is an instruction style that is collaborative, democratic, responsive and problem-centered whereby both instructors and learners decide on the how, what and when of the learning process.

Teacher-Centered Learning

Is described as passive reception of information by students. Emphasis is placed on knowledge acquisition and the role of instructors is to be the main disseminators of information and evaluators, thus students' personal growth is not given adequate room in the learning process (Bean & Melzer, 2021).

Social Support

Is delineated as the emotional sustenance which family members, friends and health care practitioners provide. In the context of the study, it is the emotional support given by ones family and peers and it is about the fact of belonging to those who surround an individual as a network that they can count on when in need.

Technology Innovation

According to Rekik (2015) he defines technological innovation as a process whereby opportunities are developed into novel ideas which are widely applied into practice.

Student Acadmic Performance

Student performance also referred to as academic achievement as a common measure through continuous assessments or examination, hence it is a student's mean performance on non-standardized and standardized assessments.

Learning Strategies

Refers to the structure, system, methods, techniques, procedures, and process that a teacher uses during instruction. These are strategies the teacher employs to assist students learning.

Implementation

Refers to the manner that organizations need to develop, make utility of and strategically integrate organization culture, culture and control systems to achieve competitive advantage and enhance overall performance. Successful implementation of learning is hinged on effective design and management for the integration of the five variables.

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CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter presents background of the study, problem statement, research objectives, hypotheses, significance and scope of the study.

1.2 Background Information to the Study

The country's economic and social development is directly correlated to academic performance of students in institution of higher learning. Performance of students in academic achievement is instrumental in the production of quality graduates who have the capacity of becoming great leaders and provide the country with best manpower responsible for the social and economic development of the country (Kumar *et al.*, 2021). Student academic performance is critical in fueling the economy and development of a nation and also problem solver in all aspects. It is also alarming to note that the students that we invest and hope for so much fail to meet the required pass mark to graduate or do not obtain good academic results. According to Hayat *et al.* (2022), measurement of academic performance has considerably been focused on in past studies surmising that academic performance is affected by psychological, environmental, personal, economic and social variables. These variables have a strong influence on performance, however, they vary with regard to individuals and countries.

In public universities, students' performance has been alarming given that the rate of failure has been increasing from time to time. Odhiambo (2018) avers that universities' conditions are adverse; inadequacies in resources such as journals, books and teaching

and research facilities, unsatisfactory remuneration significantly hamper optimal performance and operation. He adds that such adverse conditions are the cause of low academic standards and graduates' quality. Fountain and Fountain (2013) argues that whereas government efforts have been made in order to ensure the satisfaction of education for all as envisaged in the Millenium Development Goals (MDGs), nonetheless, Kenya is faced with tremendous issues especially in terms of shortage of lecturers, which causes the performance of universities to be affected. A study conducted by Nyabera (2017), at Kisii University in Kenya for undergraduate students in their fourth year of study indicated that he tried to establish the effects of social networking platforms like Facebook, Twitter and WhatsApp and the findings showed that they had significant effect on the students' academic performance. Majority of the countries in Sub Saharan African countries are striving and are emphasizing the need to enhance free education for all to their citizens though has not been extended to cushion those in the institution of higher learning and universities as required. According to Kruss *et al.* (2015) he argued that in general, university education and development has not been a priority of global policy or research funding in recent years.

The promotion of government prestige and effectiveness can be promoted by successfully implementing integrating learning strategies (Walker, 2013; Joyce, 2015; Bryson *et al.*, 2018) which provides opportunities for the exploration and connection between professional application and academic research. Implementation of learning strategies also referred to as implementation of teaching methods refers to the various methods and techniques that university teaching staff use in this case student-centered learning, social support, technology innovation and teacher-centered learning in order to instill

knowledge and skills to the learners in order to achieve their objectives. Deciding on the training procedures relative to trained subjects is the learning strategy and it has been well established that primarily, learning strategy is instrumental in instructional design (Regeluth, 2013).

The learning strategy leads to a didactic learning and teaching approach, which combines and optimally organizes means, methods and forms of participant grouping. These aspects, assimilated in operational structures are informed by a systemic vision and are designed ensuring a creative and active learning, rationalizing the process of knowledge and training. Studies have recognized contingent approaches in implementing learning strategies as largely effective (Walker, 2013; Bryson *et al*., 2018). Alternatively, Mitchell (2014) posits that evidence suggests that managers in local government have preference for repeatedly using similar approaches in implementing projects, which have a high rate of failure.

Mitchell (2014) argues that studies have largely investigated the influence of strategic implementation, which is the incorporation of adopted strategies to organizational systems, processes and mechanisms of decision making. Single implementation approaches are universally inappropriate, hence no one size fits all. Further, Andrews, Benyon and Genc (2017) conclude that public institutions that alternatively utilize a combination of implementation approaches perform better over time. Implementation of learning strategies help institutions to create a fit with its stakeholders and clients in this case students to enable it to adapt to a turbulent and dynamic environment. It is how these learning strategies are formulated, planned and implemented that is imperative.

Formulating and implementing strategies is a systematic and continuous process for decision making on the organization's trajectory, developing appropriate operations and procedures for the achievement of projected future and determination of how to measure organizational success (Simiyu, 2013). The process is systematic, allowing the organization to argue on and build commitment to its stakeholders. Lacka *et al*. (2021) reported that 66% of corporate strategies are never implemented. The gap between strategy and performance is attributed to the gap in the process between formulation, implementation and resource utilization (Ekanem, 2013). Therefore, achieving students' performance critically relies on implementing learning strategy.

Resource utilization is the appropriate way in which human resources, material resources and physical facilities are used in the right manner and with the right people in order to achieve desired results. Investment in educational resources is instrumental in enhancing universities' capacity, allowing students to work collaboratively, learning from each other and benefitting from a supportive environment, consequently improving learning and ensuring that students maximize their potential. Ekanem (2013) concludes that instructional materials are a wide range of resources carrying information that students utilize in the learning process. Therefore, they are a key aspect of instruction that need to be used for effective and efficient learning and teaching.

Poor student performance is correlated with poor environment which results from inadequacies in educational infrastructure. General atmosphere of the learning environment and availability of appropriate facilities is directly relevant to the education quality of university students (Hadi & Muhammad, 2019). Learning outcomes are associated with utilization of resources and adequacy of resources used in teaching and

learning. Therefore, inadequate resource utilization and underqualified personnel lead to low achievement. Several factors have attributed to poor student performance for instance lack of preparedness, lack of accommodation, student indiscipline, inadequate facilities, incompetent lecturers/educators and laxity on their studies.

Educators are primarily vested with the role of effectively putting in place teaching and learning resources to the benefit of students. Therefore it is essential that they possess necessary qualifications, ability and skills so as to create positive impact on students' academic achievement. Student performance is inarguably affected negatively when educators utilize educational resources inappropriately in the process of operationalizing, institutionalizing and controlling learning strategy. According to Akungu (2014), this may be used in determining whether educational resources are under or over utilized. In this study, resource utilization would mediate the relationship between the implementation of learning strategies and students' academic performance in Kenyan public universities.

1.3 Statement of the Problem

Universities are dedicated in the provision of quality education hence it is important that they are analyzed constantly to determine whether any problems exist and action to be taken to counter them (Sandoval, *et al.,* 2019). Low performance and failure by students has become a great concern both for the students and the teaching staff of public universities a situation whereby students do not attain estimated or projected achievement as per their abilities, leading to altered personality that affects other life's aspects. In the recent times, a number of university students have failed to perform as expected and majority of them are struggling to attain the minimum pass mark where sometimes they

end up getting supplementary. Musau and Anbere (2015) delineates poor performance as one falling below desired standards. Academic underperformance or failure is a serious global problem in institutions of higher learning that has affected the international community at large and needs to be looked into critically. UNESCO (2014) concludes that 38% of students globally who have completed education have not received most basic educational skills necessary for succeeding in life. Existing data indicates that about 50% of students did not satisfy the projected academic standards in the first year of university, which is no different to Kenyan public universities.

According to Luke and Mavis (2014), despite government efforts with regard to education, academic performance has been declining since 2010, which require prompt action to be taken to address the issue. The Kenyan government through the Commission for University Education (CUE) tries to address challenges related to education ranging from inaccessibility to education to inability to pass examinations by students of all cadres yet there is still a decline in the quality of education that needs more attention. Students' academic performance is a crucial issue in learning institutions with the concerned believing that the right implementation of learning strategies are not applied hence ending up in poor academic performance and it has also resulted into finger pointing among stake holders. Alharthy *et al*. (2017) conclude that unfortunately, majority of institutions face challenges in implementing effective learning strategies which negatively affects their overall performance. Single implementation of learning approaches is universally inappropriate (Mitchell, 2014).

Inadequate resources have significantly hampered the achievement of quality education. As such, resource utilization is instrumental in achieving educational objectives and

goals. Countries in Sub-Saharan Africa face challenges such as frequent resource utilization shortages for instance physical and human resources as Ganimian and Murnane, (2016) notes. Learning outcomes in universities greatly depends on appropriate utilization and availability of resources. Despite various researches being carried out to ascertain the exact causes of poor student performances, there are no clear findings as to what exactly affects their academic performances. This has made the problem remain unresolved. The researcher would therefore like to establish the mediating role of resource utilization on the relationship between implementation of learning strategies and academic performance of students in Kenyan public universities.

1.4 General Objective

The general objective of this study was to determine the mediating role of resource utilization on the relationship between implementation of learning strategies and academic performance of students in Kenyan public universities.

1.4.1 Specific Objectives

i. To determine the effect of student-centered learning strategy on academic performance of students in Kenyan public universities.

ii. To determine the effect of social support strategy on academic performance of students in Kenyan public universities.

iii. To establish the effect of technology innovation strategy on academic performance of students in Kenyan public universities.

iv. To establish the effect of teacher-centered learning strategy on academic performance of students in Kenyan public universities.

v. To determine the effect of resource utilization on the relationship between:

a) Student centred learning and academic performance of students in Kenyan public universities.

b) Social Support and academic performance of students in Kenyan public universities.

c) Technology Innovation and academic performance of students in Kenyan public universities.

d) Teacher Centred learning and academic performance of students in Kenyan public universities.

1.4.2 Hypotheses of the Study

$H0_1$ There is no significant effect of student-centered learning strategy on the academic performance of students in Kenyan public universities.

$H0_2$ There is no significant effect of social support on the academic performance of students in Kenyan public universities.

$H0_3$ There is no significant effect of technology innovation strategy on the academic performance of students in Kenyan public universities.

$H0_4$ There is no significant effect of teacher-centered learning strategy on the academic performance of students in Kenyan public universities.

$H0_5$ There is no mediating effect of resource utilization on the relationship between:

a)   Student centred learning and academic performance of students in Kenyan public universities.

b)   Social Support and academic performance of students in Kenyan public universities.

c)   Tehcnology Innovation and and academic performance of students in Kenyan public universities.

d)   Teacher centred learning and and academic performance of students in Kenyan public universities.

1.5 Significance of the Study

The study findings would be beneficial to higher educational institutions (universities) in general since their core business is to impart knowledge to their learners, develop skills and talents and produce graduates that are fit for the job market. Further the managements of the various universities in Kenya would be able to make use of the results and come up with policies that would be able to address their challenges in order to improve on student performance. Also, they would be able to adopt the recommendations given and even do more researches on how to formulate and implement the various strategies in order to reduce the failure rate of their students.

Secondly, this study would benefit strategists and policy makers. Strategists' actions plans may embrace this study findings because it would guide them through their planning, give them the right direction and enable them to formulate strategies that would be beneficial to their stakeholders. For the policy makers it would assist them come up with policies that would work in favour of educational institutions so that they would be\able to make maximum use of their effort to improve students' performance.

Thirdly, government and other funding institutions would benefit in that they would know which strategic planning ideas should be given priority through funding over

others. They would understand that in doing this they would be investing where they would realize the value of it some time to come and be able to enhance their economy.

Fourthly, this study would be of benefit to academicians and scholars since they would try to implement some of the strategies and see if they work for them and also do further research to try and improve on the already given strategies.

Lastly, the findings would be useful to the parents, trainers, employers, managers and the country as well as the region as a whole. The findings of the study would: highlight areas that trainers need to put more emphasies on implemention of learning strategies in to improve educational standards and reduce failure rate of students. It would also provide proposals that if learning strategies are implemented it would create an enabling environment and improve social and economic development and room for improvement on student performance. It would also assist future researchers in identifying gaps and do more researches in the area and thus the study envisaged to assist those in the education system and other sectors to realize how important not only to formulate strategies but most importantly to implement them since it has an impact on the performance of students.

1.6 Scope of the Study

The scope of the study covers the mediating role of resource utilization and the relationship between implementation of learning strategies and performance of students in the selected Kenyan public universities. The study was undertaken in 9 randomly selected universities as a sample size from the existing population of 31 public universities in Kenya. The target population was 4,343 full time teaching staff in the 9

selected universities out of which a sample size of 366 was taken.The nine universities randomly selected are Technical University of Kenya (TUK), Kenyatta University (KU), Kisii University (KSU), Jomo Kenyatta University of Science and Technology (JKUAT), Maseno University (MU), Maasai Mara University (MMU), Egerton University (EU), Moi University(MU), and Jaramogi Oginga Odinga University of Science and Technology (JOOUST). The study was carried out between June 2021 to August 2021.

1.7 Limitations of the Study

The researcher faced a number of challenges for instance when the questiopnnaires were give to the respondents, some were not available on the agreed date of collection to hand them over and also navigating between the distances of the nine universities was not an easy task due to financial implications involved and time spent.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature relevant to the study. The literature that was reviewed include, study concepts, theoretical framework and conceptual framework.

2.2 The Concept of Student Academic Performance

Academic performance also known as academic achievement is conceptualized as focus on final results (Rois *et al.,* 2011) and is a primary component of education (Rono, 2013). It is argued to be pivotal and upon which the entire education is founded. Diaz-Morales and Escribano (2015) aver that academic achievement is an outcome of the combination of economic, social and psychological elements which result to student's adequate development. According to Narad and Abdullah (2016), students' academic performance influences failure or success of academic institutions. Further, Singh, Malik and Singh (2016) concluded that students' academic performance directly impacts a country's socio-economic progress.

Academic performance is delineated as accomplishment of certain tasks measured respective to predetermined standards of completeness, accuracy, speed and cost (Komba, Hizza & Jonathan, 2013). Academic performance has two varying extremes; academic success and academic failure. Academic failure is argued to be of crucial concern in Iran's higher education centers. Despite there being challenges across educational institutions and education levels, the desire to pass and obtain a degree is notable among university students. Student academic failure, which includes drop-out, is

a major issue globally and the drop-out rate has also increased in parallel (ranging from 20 to 40% across developed countries), and those who drop out tend not to return (da Silva *et al*., 2017). Performance is about performing with knowledge in a context faithful to more realistic adult performance situations, as opposed to out of context, in a school exercise.

In Latin America, Suhaini *et al*. (2020) posits that the scope to which family members and parents are engaged actively in education of students positively influences academic achievement. Majority of the countries are striving to improve their education standards right from kindergarten to university yet students' poor academic performance remains a challenge among many universities. Various researches carried out on implementation of learning strategies in various parts of the globe have revealed that they have a significant impact on performance of students such as Haas (2002) USA, Bategakee (2012), Luntungan (2012), and Asikia (2010) in Nigeria. In the United States (US), students lag behind in international mathematic compared to majority of countries. The challenge is persistent despite educational spending per student having been adjusted higher than other countries.

Students' academic performance at University of West Indies (UWI) has recently been highlighted for a variety of reasons. A 2011 report from the university's Office of Planning and Development revealed that of all courses offered at the university, about 10% had high rates of failure. Completion rates have been negatively impacted, which is attributable to students' low performance in academics especially in early courses of the undergraduate program (Hayat *et al*., 2022). In South Africa, the rate of students' success and performance is posited to be 74% compared to 80% which is the expected

benchmark. With this, the graduation rate in South Africa is 16% which falls below the international and national expected standards for higher education students (RSA, 2013; Center for Higher Education Trust, 2016).

Averagely, the rate of admission into institutions of higher learning is below 15%, of which graduation rates of students from university is below 50% (Tewari, 2014). South Africa's failure in its education system is also a factor that leads to high rates of drop outs, making it a major issue that policy makers focus on addressing. Despite efforts by government, for instance increasing education sector investments, students' performance seems to remain inadequate and graduation rates remain unimpressive. Many universities around the world including Kenyan universities' students do not perform quite well (Basri *et al*., 2017). In the Kenyan context, the education system is heavily characterized by examination-oriented teaching, which means that passing examinations is Kenya's main performance benchmark despite various schools performing poorly (Musau & Abere, 2015).

Voyer and Voyer (2014) aver that students are university products. High rates of failure led to various researches being carried out for the purpose of unravelling the reasons for poor performance among students. Research on effectiveness of instructional strategies reveal that students' performance is reflective of the teaching process in educational institutions (Ganyaupfu, 2013). Success rates of student performance in South Africa is argued by RSA (2013) to be 74% in comparison with national expectation of 80%. This leads to graduation rates at 16% which RSA (2013) argue to be below international and national standards for students undertaking three year programs in university (Center for Higher Education Trust, 2016). In addition to low graduation rates, there are also high

costs associated with high drop-out rates and low rates of completion, coupled with various inefficiencies such as in the case of remedial teaching which is a big burden on personnel and the institution in general. According to Foley and Masingila (2014) and Allais (2014), poor quality of higher education in the Kenyan context mainly manifests itself in the inadequacy of classes, support activities and educational infrastructure, which leads to extreme challenges and difficulties not only for personnel but students as well.

Chege (2015) argues that high ratios of lecturers and students are prevalent across Kenya's public institutions, where one lecturer teaches about 70 students. On the other hand, Odhiambo (2013) posits that with high PhD turnover in Kenya, there is an inadequacy of qualified personnel in the country's universities. Universities face the challenge of finding quality personnel when in need of recruitment, which is as a result of brain drain (Odhiambo, 2013). It is also important to note that lecturers in our public universities move freely from one institution to the other trying to part-time in order to get additional money and this is evident that their time and commitment is limited, hindering them from concentrating on students' development, thus it translates to poor performance. Also taking a look at the postgraduate students, the lack of adequate supervision is a critical issue, as well as the prevalence of dissertation requirements being downgraded (McCowan, 2016).

Performance management is a continuing process of identification, measurement and development of performance and alignment of performance with organizational objectives and goals. Currently, academic performance is fathomed as a representation of individual aptitude and is primarily a determinant of individuals' career and status, despite its value being questioned in one way or another. In addition, academic

performance is crucial in understanding the development of the intelligence test, which is one of psychology's prominent tools.

According to Fountain and Fountain (2013), the institutions' organization and physical infrastructure have a significant influence on the establishment of culture towards success. They argue that adequacy of learning resources and classroom aesthetics are an essential element in improvement of students' achievement and overall academic interest. In addition, they argue that relatable images through video presentations, news, stories, posters, awards and projects are a big plus in student performance. Academic performance or academic achievement is concluded to be a result of education and is argued to be a vital measure of education quality in any country.

In the tertiary level, academic performance of undergraduate students is often expressed in Grade Point Average (GPA) terms. Omodan (2022) posits that academic performance is impacted by various factors such as class size, availability of resources, class schedule, class environment, financial aspects and technology utilized in the teaching and learning process. In another study, Piper *et al*. (2018) concluded that a variety of factors associated with failure of students include incompetency of teachers, lack of appropriate infrastructure, insufficiency in educational resources, cost of resources and curriculum changes. Okorodudu and Osia (2016) conclude that performance reflects the true position of an individual when exposed to certain test series. It is thus, failure or success on the test series. Remarkably, prevalent poor performance by students is primarily associated with ineffective application of implementation of learning strategies which when applied effectively, would have a positive impact to students (Balan *et al*., 2019).

Various researches on effectiveness of implementation of learning strategies have concluded that students' educational achievement is the main aspect that reflects quality teaching. Usman (2015) delineates teaching as a process involving bringing about change in learners as desired in order for certain outcomes to be achieved. According to Orji and Ogbuanya (2018), for the strategies to have a positive outcome, teachers have to be conversant with the variety of strategies at their disposal which notably recognize the scope of complexities of concepts that need to be addressed. Vincent and Udeme (2014) concludes that differences in students' performance has been associated with teaching strategies or lesson presentation techniques.

Whereas higher education quality is perceived broadly (Damsa *et al.*, 2015; Elken & Stensaker, 2018), it has been concluded that a significant role in the achievement of education quality is related to teaching and learning processes, as well as the planning and enactment of the processes aimed at providing meaningful learning experiences (Ashwin, 2014; Dolmans *et al.*, 2016; Altbach *et al.*, 2019). Intensity that educational institutions engage in the utilization of formal strategic planning directly and positively impacts development of universities and has a mediating effect on organizational and managerial factors of overall performance. There is a reciprocal association between academic performance and intensity of strategic planning. This means that intensity of strategic planning in educational institutions enhances academic performance, and alternatively better performance leads to enhanced intensity in strategic planning. Students are largely failed by prevalent uniformity in teaching processes and techniques across educational institutions.

Overall performance in higher education depends on individual academic performance of students (Hadi & Muhammad, 2019). Measurement of previous student performance is a crucial indicator of future performance, which means that students' expected performance is higher respective to high previous performance. Alternately, according to a study by Ali *et al*. (2013), who investigated the relationship between educational and social background on overall performance, the findings revealed that students from deprived backgrounds both educationally and socio-economically showed poor academic performance compared to students from higher educational and socio-economic backgrounds.

Undoubtedly, the measure for socio-economic categorizations and standards varies from country to country depending on values and norms of each country. The measure for low socio-economic status in developed countries would differ significantly from the measures in developing countries (Ali *et al*., 2013). Similar outcomes would be experienced comparatively between developing and under-developing nations. Families' total incomes, annually or monthly and their expenses have a great impact on academic and learning opportunities that are accessible for a chance at academic success (Nieuwenhuis and Hooimeijer, 2016). In addition, because of residential segregation and stratification, students from low socio-economic backgrounds tend to school at institutions with lower levels of funding, infrastructure and resources, a situation that hampers educational achievement and students' performance which is a risk to the function of education in their future endeavors (Nieuwenhuis and Hooimeijer, 2016).

Considine and Zappala (2022) conclude that students coming from low income families make more models known regarding learning outcomes; low retention rate, low levels of

literacy, behavioral problems and difficulties in studies. They also have attitudinal problems and perceive education negatively. The viewpoint in this case is further emphasized by Nieuwenhuis and Hooimeijer (2016) who argued that students from low socio-economic backgrounds perform poorly and obtain unimpressive scores academically compared to students from higher socio-economic status.

2.3 Implementation of Learning Strategies

The main objective of implementing learning strategies at all education levels is the transformation of learners into productive and useful members of society. According to Stone and Morris cited in Wahid *et al*. (2022), learning strategy is defined as a general plan for lessons which involves structuring, developing instructional objectives and outlining tactics that are instrumental for strategy implementation. Wahid *et al*. (2022) further elucidates that implementations of teaching tactics include teacher behaviors that are manifested in class, learning strategy development, providing students with appropriate stimuli for appropriate response, drilling learnt responses and increasing students' responses through engagement of extra activities. According to Kimweri (2014), implementation of learning strategies are delineated as the myriad ways that participants and the methods to be adopted and implemented in facilitating the teaching and learning process are organized. Kimweri (2014) adds that the methods are determined by varying aspects such as students' number, students' age and topics to be taught.

However, according to Osokoye (2016), implementation of learning strategies are plans outlining approaches teachers intend to implement for desirable goals and objectives to be achieved. Further, Solomon (2020) argues that in order for desirable changes to be

realized in students, methods of teaching implemented by teachers should be appropriate and suitable for the subject being taught. Teaching methods are effective if they are suited to the needs of learners since each learner responds and interprets questions uniquely.

Implementation is iterative, thus implementation of strategies, programs, policies and action plans gives firms the capacity for resources to be utilized and opportunities to be taken advantage of hence maintaining competitiveness (Kimweri, 2014). The implementation process is also perceived as "lively", by which future opportunities are identified by organizations. Employees, managers and infrastructure need to be pooled in a manner that results in high capabilities of implementation, which when achieved would enhance the competitive nature of the organization. Management is instrumental in strengthening an institution's learning strategies, allowing faster achievement, which in extension enhances student performance.

Implementation can comprehensively be delineated as a dynamic, complex and iterative process, comprising a series of activities and decisions by management and personnel and which are impacted by various interrelated external and internal aspects, allowing strategic plans to be turned into reality so as to achieve strategic goals and objectives (Osokoye, 2016). It is also a process of resource allocation purposely to provide support to strategies chosen by an organization. The implementation process comprises variety of activities by management which are pivotal for placing strategy in motion, instituting strategic controls for monitoring progress and achieving organizational objectives (Kimweri, 2014). Implementation is also said to be system wide, and actions are taken by members of the organization so as to accomplish strategies formulated by management,

therefore it is pertinent for performance of the organization because without implementation, strategies alone do not add value.

Hayati *et al*. (2021) argues that low academic performance by students in different areas of study is associated with teachers' ineffective implementation of teaching methods which are impactful to learners' knowledge, therefore it is essential for teachers to be conversant with different learning strategies. Improved methods exist which teachers can utilize for knowledge transfer to learners instead of using traditional strategies. Lecturers continue to show awareness in the manner that learners gain knowledge. According to Walker (2013), strategy alignment with appropriate approaches of implementation is pivotal to success of formulated strategies more than the stage of formulating the strategies. This means that implementation is crucial hence it should be explored adequately. Dual adaptive/planned approaches in implementation is highly effective in both private and public organizations compared to instances when either is employed individually.

Mitchell (2014) argues that of all strategies formulated by organizations, less than 50% are implemented. Sika and Opiyo (2017) posit that the low trend of implementation is attributed to inadequacies in commitment and resource allocation or adoption of closed systems with regard to implementation timelines. Lack of or failure of strategic planning negatively impacts students' academic performance. Emphasis placed on strategy development is thus disadvantageous for institutions since it means that effective strategy implementation tends to be disregarded.

According to Hoidn (2017), implementation comprises placing strategy into practice,

which involves introducing new models of service delivery, monitoring operational changes for effectiveness and organizational structure redesign, evaluating the system and culture necessary for new strategies. Joyce (2015) further posit that strategy implementation in organizations is similar to fighting long and bloody battles where the possibility of failure is comparatively high.

Although formulation of consistent strategies is a challenging task for management teams, ensuring that formulated strategies work by implementing them across the organization is equally challenging (Tawse and Tabesh, 2021). Therefore, it is not surprising that after formulation of either single or comprehensive strategies, difficulties tend to emerge in the organization during subsequent processes of implementation. Implementation of learning strategies is difficult in organizations. According to Asava (2016), various strategies albeit well-conceived and costly for organizations are not implemented but discarded, which is a result of inadequacies in strategy implementation subject to organizational capability and resource adequacy.

Strategic planning is a managerial process that involves sequential, analytic and evaluating procedures for formulating intended strategies and the process or means of implementation while ensuring that the organization maintains competitive advantage (Morrar, 2014). Strategic planning involves development of the organization's mission, objective, strategy and policy forming the foundation of communication to others for informing, motivating and involving them (Asava, 2016). Further, it ensures that organizational resources are effectively utilized by emphasizing that resource utilization is focused on organization's primary priorities and serving as a decision framework to

secure support. It also enable results monitoring, enhancing accountability, assisting in benchmarking, facilitating performance monitoring and evaluation, stimulating change and being the foundation for future plans (Asava, 2016). The best learning strategies may not have value to the institution if they are formulated without ineffectively implemented. Findings from studies indicate that Strategic Human Resource Management (SHRM) is instrumental in strategy implementation and that rewards motivate university lecturers which makes strategy implementation effective.

In Kenya's context, the development of strategic plans is a ministerial requirement for all organizations and institutions whether educational or public, which is a way of enhancing operational efficiency and management results. These strategic plans should ideally provide the organizations and institutions with appropriate direction towards implementation of programs and targeting resourcefulness. Even organizations and institutions with strategic plans tend to disregard the significance of implementation and the shortfall has resulted to haphazard planning, insufficient prioritization and failure of resource allocation for intended projects. Most organizations and educational institutions do not achieve their objectives and goals, which is seen in their overall performance.

Strategy implementation is often time consuming and complicated when organizations get into strategic management. Alternatively, strategy formulation is a creative and intellectual activity that needs to be studied. Chow (2017) posit that implementation of learning strategies was a critical driver of strategic management emergence in the 20th century. However, most managers have more knowledge of strategy formulation and little on strategy implementation which is more challenging for them. Candido and

Santos (2015) concludes that strategy success is unattainable without effective implementation.

Akungu (2014) posits that many of the knowledge implementation strategies have been argued to be ineffective on students' capability to retain ideas. Some approaches of knowledge transfer to students have been passive rather than active. Old fashioned approaches such as recitation and lecture lack the capacity to foster collaborative problem solving or creative and critical thinking (Martha & Santoso, 2019). Udu (2018) concludes that various instructional strategies are surmised to have been developed basing on the notion that learning occurs when students are actively involved in the process of knowledge acquisition rather than being passive. According to Etim *et al*. (2020), queries on the effectiveness of teaching techniques on student learning have led to considerable interest in educational research. One of the main challenges in the process of teaching and learning, according to Cardino and Cruz (2020) is knowledge on highly effective strategies and approaches that are aligned with students' dynamic learning styles.

2.3.1 Student-Centered Learning

Student-centered instruction (SCI) in other words referred to as student-centered learning or learner centered learning is a method of instruction whereby content, learning environment, materials and activities are influenced by students. This approach focuses on learners as the core of the learning process. Learner-centered approach emphasizes on how students learn rather than how teachers teach (Zhang & Tang, 2017). Learner-centered classrooms are characterized by teachers abandoning lecture materials and

presentations, going instead for more engaging, active and collaborative techniques of teaching. Teacher-centered approach are still largely used by lectures even though there are other options for instance the learner-centered teaching that can be used in higher education. In learner-centered classrooms, learners learn actively and their input is towards what is learned (Slavin, (2016), Lindquist, (2015), how it is learned, where it is learned and when it is learned that is greatly emphasized. It means that students are responsible for their learning and are directly involved in the entire process. The environment plays a critical role in provision of learning opportunities and therefore emphasis should be on environment development that allows learners to make adequate use of what the environment provides such as guidance, discussions and assignments to allow for stimulation and enhancement of learning. Lindquist (2015) posit that when focus is directed towards the creation of spaces that allows students to act upon their interests, needs and intentions within a supportive structure, learning and overall performance is enhanced.

Zhao (2014) avers that whereas previous research showed that "passive transmission" had a positive effect on learning, curriculum reforms encouraged educators to change their approaches from "teacher-centered" to "student-centered". Students enjoyed the student-centered implementation of learning environment more than traditional lecture (Zhang & Tang, 2017). The concept of "discovery learning" led to various scholar widely adopting student-centered methods which were considered to be supple and improved active learning (Ganyaupfu, 2013). Currently, the student-centered approach has been adopted by educators for the promotion of educational interest, critical thinking,

analytical research and educational enjoyment among learners (Slavin, 2016; Lindquist, 2015).

During small group interactions, educators are expected to manage interactions, which is a guarantee for evaluative input to aid the individuals and group of learners to develop and improve. Educators provide learners with an opportunity for independent learning and learning from one another, which is an avenue for coaching them in skills needed for effective learning (Slavin, 2016). The student centered approach involves techniques including substitution of active learning for lectures, adopting open-ended problems which enhance creative or critical thinking skills due to the fact that they do not follow text illustrations, involvement of students in role play and simulation and adopting self-paced or team based learning.

In light of evidence on how effective student-learning approaches are, Eli (2021) concludes that supplementation or replacement of lecture techniques with active learning and student engagement in scientific and discovery processes enhanced knowledge retention and student learning. Learners in this learning approach are extrinsically enthused and are able to learn skills such as problem solving and critical thinking skills (Ku *et al*., 2013). Ku *et al*. (2013) conclude that SCL puts learners' prior knowledge forward as it informs future learning. When learners are grouped in small numbers for learning activities and SCL presentation, they are able to actively interact with one another, sharing ideas and showing improved commitment to the team.

When SCI is implemented properly, it can enhance students' learning motivation, improve knowledge retention, enhance understanding and develop positive attitudes

towards subjects taught. The term "student-centered learning" (SCL) has been used widely in literature discussing learning and teaching and has been associated with a variety of perspectives including experiential learning, flexible learning and self-regulated learning (Jarvenoja *et al*., 2015). In "learning-centered assessment" assessments and instructions are more focused to learning rather than from teaching. An additional perspective linked to SCL is the concept of self-regulation, which primarily focuses on how learners develop strategies with which to tackle their learning (Jarvenoja *et al*., 2015).

According to Freeman *et al*. (2014), various educational researchers and theorists have attempted to elucidate the appropriate ways that learners learn, improve skills, retain knowledge and create innovatively with the objective of enhancing instruction and engagement. Hoidn (2017) avers that generally, student-centered learning describes learners' efforts of active engagement while learning and educators' facilitation and design of effective learning processes. There exists various reasons why universities do not use student-centered learning and similar experiences are shown in challenges faced in Vietnam with student-centered environments due to social order and Confucian ideals of receptivity and conformity (Tran, 2014).

According to Ott, Carpenter, Hamilton and LaCourse (2018), SCL has had various terms and definitions, which has often times been confusing. For instance, in "active learning" learners read, write, discuss, analyze, create, and exercise high skills of thinking. Alternatively, in "collaborative learning", learners work with peers: gain skills in communication and collaboration by engaging with peers instead of merely participating

in content and knowledge building (Ralston, Tretter & Kendall-Brown, 2017; Zheng, Yang Cheng & Huang, 2014). In "experiential learning" learners engage with each other and reflect on individual experiences in knowledge acquisition and gaining skills.

Konak, Clark and Nasereddin (2014) augur with Pugh (2014) in their summation that this model comprises four levels of experience, conceptualization, reflection and experimentation. "Problem-based learning" involves educators giving complex problems and questions to learners and aiding them in structuring and forming ideas through brainstorming. The process involves learners learning principles and concepts in a much broader way than the specificity of problems given to them (Brassler & Dettmers, 2017). According to Lee and Hannafin (2016), the different terms associated with SCL are related closely to "student-centered learning", which places emphasis on learners' role with regard to curriculum, content and practice.

Forsell *et al*. (2020) argued that when learners arrive at clear conclusions to problems which resulted from class frustrations, their classmates would perceive solutions and the problem as having less difficulty due to the fact that a fellow student solved it. Learners often perceive educators as experts in the specific subjects being taught, so traditionally, teacher-centered classrooms render learners to be intimidated by subject matters they perceive as difficult or challenging and that only educators are capable of solving them or other individuals in similar capacity to the educator. Chih-Hsiang *et al*. (2013) concludes that potentially, this outcome results from instances when learners attempt to find solutions themselves and are frustrated by the problem or are not motivated towards task completion.

Student-centered learning provides learners with the capacity of owning their learning, helping them to make appropriate decisions and judgments regarding content relevance and teaching methods respective to their educational interests. In student-centered learning, learners have a crucial role of designing their curriculum. Educators lay a role of facilitation or guiding students towards educational achievement. Lee and Hannafin (2016) conclude that discussions and interactions of learners with educators and fellow learners are instrumental for effective learning.

Ng and Lai (2012) study investigated whether student-centered learning is enhanced by wiki-based projects. The findings from their study established that student-centered activities are facilitated by wiki. Learner-Centered Psychological Principles (LCPs) may be utilized in definition of novel design principles for distance learning and also for novel educational paradigms. Learner-centered technique facilitates development of educational activities and enhances student learning as well as facilitating authenticity in assessment of students. Learners' academic performance is enhanced when they have a say on what is learned and when educators role is facilitating the learning process which allows active learning by students.

A study by Wohlfarth *et al*. (2008) investigated the notion that learner-centered method is a departure from traditional teaching techniques, focusing on learners instead of educators and less on teaching but more on learning. The study surveyed graduates in learner-centered environments to establish their perceptions regarding experiences related to learner-centered dimensions. The study concluded that learner-centered method influenced how students felt about themselves and how they felt about teacher perceptions of them, meaning that they felt respected, enhanced critical and thinking

skills and developed self-directedness. Overall, the findings of the study revealed that graduates in learner-centered environments were learner-centered, which augurs with Weimer (2002) assertion. Additionally, from qualitative data, the findings revealed that learner-centered method was supported as having significantly positive outcomes. Boud *et al*. (2018) concludes that student experiences focus and aim at maximizing positive experiences, which places learner-centered techniques at the forefront with enhancing student educational achievement and academic performance.

2.3.2 Social Support

Baghurst and Kelley (2014) refers to social support as emotional sustenance which friends, healthcare members and family provides to an individual. It also delineates the experience of an individual being respected, valued, cared for and loved by people they are associated with. Individuals whose social support is strong are embedded better in the network and are implementation of better in their society and community. In the educational environment, individuals with better support are positioned better and have a higher chance of improving their educational achievements. Learners' lives, especially in the first year of study is characterized by vulnerability whereby learners have to establish, adjust to and test the new environment respective to their psychological identity.

Despite the nature of support that can be provided to the students by their parents, having trusted friends are also an essential source of information, support and social capital. However, it depends on whether the friends can access necessary information. Peer support promotes feelings of empowerment (Kimweri, 2014), lessen the stressors of an individual (Salvin, 2016) and decrease the feelings of loneliness and difference in a group, as well as it may enhance one's social competence, social acceptance, and

increased acceptance of chronic conditions (Kumar *et al*., 2021). Many at times student perceive transitioning to the university as an exciting experience but the change of events could turn out to be stressful. This is because students are exposed to a new academic environment, independent social life and responsibility.

Peer victimization can seriously affect academic performance and those who are experiencing peer rejection are reported to obtain lower GPA (El-Khalili and El-Ghalayini, 2014). Peers whose parents are not faced with the identified challenges are unable to share the information with their friends. Peer social support can address emotional encouragement (e.g. praise) and there is a positive influence on both the person who is receiving support and providing support. However, due to the fact that adolescents make friendships with peers from same ethnic backgrounds, adolescents from ethnically minority backgrounds have a higher likelihood of developing friendships with those whose social capital mirrors theirs - from low status, hence they miss out on necessary information regarding the educational environment. Whether they access the information or not, ethnic differences exist which also influence peer academic support, hence in many instances, support is received from peers of similar ethnicity (Crosling *et al*., 2014).

For high-achieving learners, peers tend to continue with similar support levels and parents tend to reduce their support, for instance, ceasing active monitoring of learners so the learners can develop their own experiences and independence. Konak *et al*. (2014) avers that academic development is perceived as being closely associated with social development. In Ghana, a health survey indicated that more than 80% of adolescents have experienced worries, sadness, hopelessness and loneliness which negatively

impacted their life's activities (Glozah & Pevalin, 2014). The search and use of social support and the perception of its availability can be essential in order to reduce stress associated with educational pursuit.

Piper *et al*. (2018) argue that social support functions as a protective element that prevents poor academic achievement and disengagement from school activities. Social support helps reduce loneliness among learners. It is surmised that students search for social support as a coping strategy and various studies have established that academic achievement is favored by social support. Low levels of social support has alternately been concluded to be correlated with educational failure and low performance (Dolmans *et al*., 2016). Regardless of scarce research within the context of college students, similarity of results exists, indicating that enhanced academic performance is correlated to higher levels of support from parents and teachers. Most students communicate with family in the early years upon entry to college, expressing challenges faced in academics, hence students make reference to their parents and other family members as their main source of social support.

Social support counters the negative effects of stress on learners' health and educational achievement, which enhances performance in the long run (Fang, 2016). According to Crawley *et al*. (2015), students from low-status backgrounds perform poorly and obtain poor scores compared to students from high-status backgrounds. Negative thinking has similarly been found to lead to procrastination (Pascoe *et al*., 2020) and ultimately affects students' educational performance (Mammen & Faulkner, 2013). Other researchers have identified that familial socio-economic status directly impacts academic performance of

learners. Singh *et al.* (2016) surmised that academic performance is significantly affected by learning facilities, followed by parental guidance.

Students in their first year require adequate social support to enable them succeed in academics. Social support is specifically essential in prevention of stressors due to the fact that learners experience both personal and academic stresses. In addition, social support is pivotal for learner's lives and they have been established to have a significant correlation with educational achievement (Yasmin *et al*., 2019). Some researches carried out in Asia revealed that social support is crucial in management of psychological issues. Inadequacies in social support has been concluded to result to psychological issues among learners. Indeed, it is pivotal to realize that educational achievement and academic performance is not only enhanced by matters related to academics but also by social matters that students receive from those around them. Similar findings have also been established in studies conducted in Indonesia which concluded that academic problems are correlated with inadequate or lack of social support (Yasmin *et al*., 2019).

Fauziah (2012) conducted a study which investigated parental support and the influence it had on students in higher education. The findings revealed that parental support had a significant and positive correlation to students' performance in university. In the United Kingdom, findings revealed that about 20% of students in the disadvantaged category had a higher tendency of participating in higher education compared to their advantaged counterparts (Scott & Ivala, 2019). In the United States, the summation is that students' academic achievement relies entirely on parental income with most graduates coming from backgrounds with adequate income (Scott & Ivala, 2019). In South Africa's context, majority of students in higher education dropped out due to "low-income status" (Letseka

& Maile, 2008), which makes it impossible for average South African learners to access higher education. This circumstance was evidenced by continuous protests by students across South Africa's campuses. As such, improvement of funding to universities, more so for disadvantaged students is instrumental in increasing success rates of higher learning institutions in South Africa.

2.3.3 Technology Innovation

Institutions of higher education are said to be engines of development and growth in a country due to the fact that they nurture innovation (Crosling, Nair & Vaithilingam, 2014). Universities create new and improved services and products, are centers of innovation, supply training and expertise of human resources to organizations and the society (Al-Husseini and Elbeltagi 2014). Technological innovation is the successful implementation of creative ideas in the organization according to Bigliardi (2013) given that a paradigm shift is being experienced in the world and higher education is not exempted from it (Black, *et al,* 2019).

Universities are offering off campus library services by integrating the use of technology to reach out to students who may be in remote locations (Wharto, 2017). This creates convenience for students as they can subscribe to the online library material for the period in which they would need the material (Shouhong & Wang, 2017). Open access facilities enable access to scholarly materials that is available for free to users and institutions (Redwine, 2015). It is necessary for education to be seen as utilizing technology as a means for promotion of creativity, equality and empowerment as well as production of efficient problem solvers.

Jehanzeb and Bo (2013) aver that with widespread use and availability of personal computers both at school and home environments, literature over the past two decades suggest that computers have a significant and positive association with students' academic performance. In this regard, educational achievement is understood to be reflective of performance on both non-standardized and standardized assessment and literacy tests. Online technology is important in the world of various dynamisms where information can be transferred from one point to the other in a fraction of seconds.

Online learning platforms are delineated as implementation of sets of interactive services mainly providing educators, students and other education stakeholders with necessary and appropriate information, resources and tools that facilitate support and enhancement of education management and delivery (SAP Litmos, 2018). For instance Moodle cloud enables services and applications to be accessed from anywhere and at any time as the information is accessible from the service provider's main server (Basha *et al.,* 2019). With the advent of modern technologies for instance webinars, skype, video conferences and google meetings Tajbiul (2018) outlined that "education in distance mode by broadcasting media is still most convenient and cost effective to expand and ensure education for all" (Tajbiul, 2018).

Strategic innovation is a framework of business development which is focused on the business' future, identifying opportunities for growth, accelerating decisions making and creating measurable achievements in the context of the business' long term vision for competitive advantage to be sustained. Managers of organizations need to implement and utilize information systems use. Furthermore, they should hold data in high regard, without which decision making would not be effective. In the educational context,

institutions must utilize Management Information Systems as a crucial component of educational reform implementation. Fernandes and Singh (2022) concludes that one of the key factors that majorly influences students' academic achievement is technology use both during examinations and in the normal classroom.

According to El-Khalili and El-Ghalayini (2014), utilization of multimedia technology and Internet in improving learning quality through facilitation of service and resource accessibility, remote collaboration and exchange leads to enhanced academic achievement and performance among students. Wang (2014) stressed that technologies continue to support effective learning strategies. Initiatives led by government for higher education teaching and learning were established in the 1990s and played a crucial role on higher education among universities in the United Kingdom as evidenced in early 21st century.

Increasingly, university administrations are responding to the educational sector's technology demands by providing opportunities for students to learn online, creating rich learning and teaching environments. University faculties appreciate the merits of technology adoption such as convenience and supportive learning. However, resources are inadequate to satisfy the immediate needs (Chow & Croxton, 2017). Educational contributions, more so at the level of higher education that are pivotal for coping with complexities of innovation are limited in scope and even scarce in some instances. Resource use is critical and currently the trend is that institutions are shifting towards technology integration to allow for enhanced resource use through technology, thus making learning to be learner-centered, developing creativity, enhancing innovativeness and facilitating learners' knowledge construction. Kisirkoi and Mse (2016) argues that

resource use enhanced through technology has a significant influence in promoting creativity and construction of knowledge. However, Ailing *et al*. (2013) argues that feasible methods and means of promoting students' capability for innovation is still lacking.

2.3.4 Teacher-Centered Learning

In traditional classrooms, students learn passively, or are merely recipients of information disseminated by educators. Passive learning perceives educators as the only holders of wisdom and knowledge. As such, students do not have control on the what, where and how of learning. Essentially, teachers are the sole decision makers with regard to teaching methods, assessment approaches and curriculum development. According to Bean and Melzer (2021) teacher-centered learning is delineated as an approach where students receive information passively, knowledge acquisition is emphasized and educators' role is primary evaluator and information giver. The demerit of teacher-centered learning is however, that students are denied opportunities for personal growth. In the traditional era, educators concentrated on applying the teacher-centered approach to provide students with information. Briggs (2019) posit that considering that educators in the traditional approach control sharing and transmission of information, lecturers tend to maximize delivery while at the same time minimizing effort and time. Consequently, students' understanding and interest of the subject matter is hampered. Westwood (2016) concludes that to date, queries on how effective various teaching methods are on learning have considerably raised interest in educational research.

Boud *et al*. (2018) augur that traditional methods of teaching mean that learners depend on the educator for information to be obtained. The method is considered impractical, focuses more on memorization and is distinctively theoretical. Further, it lacks activity-based approaches of learning which is pivotal in encouraging students to learn about real life issues and apply knowledge based on real life experiences. Considering that the educator in the traditional method controls sharing and transmission of information, lecturer maximization of information delivery and minimization of effort and time is the main shortfall of the method and subsequently, students lose understanding and interest in subjects being taught. Teacher-centered learning holds students back from achieving growth both educationally and personally. Educators mainly use traditional methods of teaching in higher learning institutions, which surmises that university lecturers primarily apply the teacher-centered technique and there is a need for a shift to student-centered techniques.

Lak, Soleimani and Parvaneh (2017) posit that educators who rely on the teacher-centered method make all curriculum decisions, assessment methods and teaching techniques. Teachers using the traditional approach do so in order to focus on and promote techniques such as guided demonstration and lectures. These instruction forms are characterized by the educator standing in front of the class while learners simple observe and listen. The classroom's physical design is intended for learners to solely focus on the lecturer which hampers learning activity. Classrooms in the traditional approach are organized in a way that students' desks are forward-facing to emphasize focus on the lecturer. However, whereas the presumption is that student focus is

enhanced in this approach, nonetheless, student focus is affected by lack of student activities as in the student-centered method.

Teacher-centered methods prioritize teachers providing information in environments that are highly structured. Teachers organize tasks in the learning process, establish objectives for the classroom, present learning materials supporting established objectives, create methods for achieving tasks in the learning process and develops a timetable for tasks. Thus in this method, teachers take on the central role of the learning process as providers of information or primary evaluators who monitor the learning of students, thus making them passive participants in the process. Emaliana (2017) concludes that the method emphasizes exertion of control by teachers through the system of mandated routines, rules and punishments.

2.4 Resource Utilization

Resource utilization is the correct manner where physical facilities, material resources and human resources are being used in the right way during the teaching and learning of students in order to achieve the desired goal and objectives. It is the degree or extent to which a resource is put into effective use (Oladimeji, 2014). Physical facilities here refer to lecture halls or classes, library and computer laboratories, material resources being white boards, chalk or marker pen and books and human resources refer to the qualified teaching staff, competent staff and trained staff. Investment in resources is essential in ensuring institutions provides students with an environment to facilitate collaboration, learning from one another and benefitting from the environment overall, as well as maximizing learning to ensure that learners realize their full potential (Udu, 2018). The

physical, human and financial resources adequately utilized tend to influence not only the education given to students but also serves as a motivation to the teachers and students and eventually have an impact on the performance outcomes.

According to Usman (2015), availability of resources plays a significant role in students' academic achievement and performance. Specifically, resources refers to physical infrastructure such as enhanced classrooms, adequate grounds for students activities that add to the institution's aesthetics as well as being a positive influence of overall student performance. With resource inadequacy both students and the institution suffer. Dauda (2022) argues that resources are crucial due to the fact that academic goals for individual learners and the institution itself rely on utilization and supply of material and physical resources to facilitate teaching and learning. Shortages in resources hamper effective instruction and performance, which emphasizes the importance of resource adequacy.

Performance inequalities among students is a reflection of resource disparities in institutions. According to a study carried out by Tella *et al*. (2018), on the use of internet resource by educators in Delhi University, the findings revealed that challenges encountered by educators was inadequacy of computers that could be used in accessing the internet, slow connectivity and lack of training and skills in utilization of digital tools. Waseem *et al*. (2013) further concluded that inadequate training manuals and textbooks was a challenge hindering colleges in Nigeria, hence impacting students' performance. Similarly, Khan and Ahmed (2013) surveyed the implementation of Electroni Information Resources (EIRs) and established that the use of electronic resources by educators was unbalanced. However, electronic resources were majorly utilized in preparation of lectures and research.

Dauda and Hassan (2022) argue that effectiveness in teaching and learning relied on teachers' qualifications, assistance provided and utility of suitable resources including books, library, laboratory and various other aids that improve the teaching and learning process leading to better outcomes. Hallack (2014) concludes that relevant resources play a significant role in contributing to academic achievement. Academic performance is thus directly correlated to resource availability which includes textbooks, learning tools and equipment, classes, laboratories and out of class resources such as playgrounds, which negatively impact educational achievement in their absence.

In educational institutions, there are various resources indirectly or directly attributed to outcomes of learners. According to Ankrah and Atuase (2018) who investigated accessibility of electronic resources and utilization concluded that the utilization of electronic resources is beneficial for educators as they are able to gain access to a large scope of knowledge and information which positively impacts their teaching. On the other hand, utilization of electronic resources is also beneficial to students due to the fact that with accessibility to a wide range of information, knowledge is enhanced, thus performance and achievement is enhanced. Similarly, Gakibayo, Ikoja-Odongo and Okello Obura (2013) surmised that utilization and accessibility of EIRs was mainly impacted by poor infrastructural capabilities, lack of skills, resource inadequacy and appropriate processes.

Onyara (2013) arguments indicated that learner outcomes institutions of higher learning relied on available and appropriate resource utilization due to the fact that students' skill acquisition is achieved through provided resources. Subsequently, institutions need to

ensure that buildings, compound, furniture, books, playground, teaching materials, lighting and other necessary amenities are in place to facilitate quality learning. According to Sejane (2017) in an investigation on accessibility of electronic resources in Lesotho, the study concluded that electronic resources mostly accessible to students include websites, electronic mail, search engines, electronic journals and databases. The findings also established that databases and electronic journals had the least accessibility compared to electronic mail, websites and search engines.

Studies have been consistent in highlighting the need for appropriate resource utilization as a crucial component of academic achievement among students. Effective learning is an outcome of enabling environments whereby students are able to physically and psychologically interact and collaborate with fellow students. Adequate physical resources and teaching/learning materials and their utilization is consistently an issue concerning educators. Onyara (2013) concludes that resource utilization in the teaching and learning process leads to learning fruition, an outcome that is both motivating and stimulating to students and ultimately improves academic performance.

Students constitute the highest percentage of population that use the library in universities with the aim of performing better (Sharples, 2018). The same way that we have physical and human resources there is also the advent of electronic resources, that students could access information remotely using various facilities, at their convenience through e-based library facilities available in their institutions. Currently, the capacity to understand and use the digital space is a requisite for educational success. Learners are expected to utilize electronic resources to access information and knowledge, especially at university level.

Therefore, for students to take advantage of the range of resources, they need to not only acquire but practice necessary skills that are essential to exploit the varied tools at their disposal (Simiyu, 2013). Learning the needed skills is pivotal in the technological environment, which can be improved through innovative learning methods. University students' educational outcomes are associated with adequacy and utilization of teaching and learning resources in varied ways. As such, underutilization and educators' poor qualifications have a negative and significant impact on achievement and performance. Availability and resource utilization in an organization is important in achievement of its goals and objectives.

Appropriate utilization of resources in learning institutions would enhance the performance of students in Higher Educational Institutions (HEIs). Having the requisite teaching and learning materials would not only make the teachers work easier but would also provide a conducive and an enriched learning environments (Tella *et al*., 2018). Further, library and laboratory facilities also play a role in satisfactory environment which leads to academic achievement. In relation to student background, student performance has a significant correlation with satisfaction in the academic landscape. Orji (2018) concludes that students' efforts in studying and appropriate utilization of facilities respective to learning style of the students had a positive and significant correlation to educational achievement and performance.

In China and Hong Kong, Randy *et al.* (2002) found that resource utilization for instance messaging management for compensation strengthened the organization's business strategies which in the long run enhanced organizational performance. In the Iranian context, Roya *et al*. (2011) found out that organizational practice geared towards

compensation were instrumental in fulfilling contracts, which led to enhanced commitment among personnel in their duties. Roberto and Arocas (2007) findings in Spain concluded that resource utilization such as job enrichment and salary stratagems had a positive and significant influence on performance and ultimately improved implementation of organizational strategy. The findings in these different contexts point to the summation that resource utilization would not only impact teachers' input but also have a significant influence on students' output with regard to academic performance.

In most Sub-Saharan states, education is characterized by severe resource shortages, both human and physical (Ozier, 2018). In his argument, instead of governments in the Sub-Saharan states distributing limited resources uniformly across institutions to cater for educational needs, they make large allocations of these resources to select schools, which leads to inadequacy in other schools and not only poor achievement in the shortchanged institutions but also poor performance among the students. Adeniran (2013) study in Nigeria's Redeemers University found that students were knowledgeable about the various resources accessible in the university. However, the use of these resources especially electronic resources was considerably low. Similar problems were found in Kenya by Kenya Education Sector Support Programme 2005-2010 in Kenya, where performance of schools was hindered by issues in resource utilization and prioritization. Nonetheless, the Kenyan government has initiated programs that are geared towards resource acquisition to enhance quality education access to all its citizens.

Student outcomes are influenced by how well educational resources are utilized, both physical and human. Results from a World Bank (2008) study on the significance of

resource utilization entailing textbooks and other physical resources in Sub-Saharan countries that included Cameroon, Ghana, Botswana, Kenya, Togo, Malawi, Tanzania, Rwanda and Kenya concluded that compared to rural schools, urban institutions are better equipped with both physical facilities and textbooks. Croslin *et al*. (2014) concludes that what matters most is not availing resources to educational institutions, rather having them utilized by students and teachers to facilitate academic achievement and overall performance. According to Komba *et al*. (2013), class size increase, while it may be perceived as a physical resource, negatively affects achievement and performance, which gives the impression that for academic achievement and performance to be successful, educational institutions should emphasize on quality of resources rather than quantity of resources.

In a study by Ding and Lehrer (2008), it was found out that resource utilization improves the ability of university students to benefit more from reductions in class size. The findings also revealed that students with low educational ability do not benefit in the same manner. For such students, reduction of class size reduces their achievement capacity and leads to low grade retention, less discipline issues, low cases of drop outs and more learners taking exams to enter college (Ajayi, 2014). Kafumbu (2020) also concluded that various reasons have been established to why resource utilization of reduced classes has a positive association with high educational achievement, which include better contact between educators and parents as well as enhanced relationships between educators and learners. For instance, learners pay more attention when the class size is small compared to when the class size is large.

According to Amuma and Idoli (2013) study, when material resources are reinforced in an institution, students' achievement and performance improves compared to students who are disadvantages in terms of material resources. Gulap *et al.* (2017) argues with the sentiment, concluding that when students are positively reinforced, they are motivated, hence improvement in academic performance is realized. Reinforcement plays a significant role in students' achievement and performance.

2.5 Theoretical Framework

The theoretical framework could be delineated as an assortment of interconnected concepts which the researcher adopts to guide a study (Braidotti, 2019). Theoretical perspective entails looking at an idea or a concept and understanding it based on set assumptions and theories in a certain field. In academic research, assumptions respective to adopted theories aid in supporting a study. In this study the theories that will be used are system theory, Implementation theory and Walberg theory of Academic Achievement.

2.5.1 Systems Theory

Systems theory was propounded in 1940 by Ludwig von Bertalanffy and further developed by Ross Ashby. Von Bertalanffy propounded systems theory as a reaction against reductionism and as an attempt for the revival of science's unity. His emphasis was that systems are characterized by their openness and interaction with their environments as well as their capacity of acquiring new aspects through emergence which leads to continuous evolution. Instead of reducing entities only to properties of their elements or parts, systems theory places emphasis on how the parts connected to the whole are arranged and the relationship between the parts. The theory points out that a

system is determined by the organization of its parts. Further, the system is independent of the various interrelated parts. Thus, the principles and concepts of organization form the basis of various disciplines, thus facilitates their unification. Subsequently, concepts of systems include input, output, system-environment boundary, state, goal-directedness, process, hierarchy and information.

The system theory would guide the study in a manner that the various students are admitted into the university and lecturers instill knowledge into them that is the input. As they learn, do assingments and examinations those are processes and when they graduate and are awarded the degree then that is the output. The students ability to demonstrate and practically do what they have learnt in the various industries is the (feedback). The students pursuing the different courses and being taught by different lecturers in the university are like the different parts or elements of a system. One part of a system (a student) cannot perform without the other part (a lecturer) in that there is need to incorporate all the parts in order for the system to work efficiently and acquire new knowledge. According to Ayuba (2018), regardless of the aesthetics of an institution's assets and programmes, in the absence of academic personnel, the institution cannot attain its objectives and goals. The different courses that students pursue are interdependent and interconnected with one another in that one leads to another in form of a process in order to make the system complete. They support each other in order to work well.

2.5.2 Implementation Theory

Implementation theory initiated by Maskin (1999) is a component of game theory which is closely associated with mechanism design where a mechanism is added to a game

leading to the game's equilibrium conforming to an optimality concept such as Pareto optimality. If the mechanism has a property that, in each state, the equilibrium outcomes match the optimal outcomes, indicated by the rule of social choice, then it is surmised that the mechanism implements the rule of social choice.

According to the theory, the extent to which the rule of social choice is implementable or not relies on the game-theoretic concept used. The theory guides the study in that the aim of any higher learning institution is to produce competent and all round graduates. The implementation of the various learning strategies in the institution is for the sole reason to improve the performance of the students and hence the institution has to sacrifice a lot in terms of finances and time in order to acquire qualified staff, inventing latest technologies, acquire learning and teaching materials and building enough classrooms in order for their students to perform upto the required standard.

2.5.3 Walberg's Theory of Academic Achievement

Walberg's theory posits that individual psychological factors of students and their subsequent environments significantly influence their educational achievement (attitudinal, behavioral and cognitive) (Reynold & Walberg, 1992). More recently, Galizty and Sutarni (2021) showed the significance of domains of self-regulated learning strategies, social-interpersonal abilities and motivational orientations on enhancing educational achievement and academic performance of students. When students have mentors who guide them through their psychosocial,emotional, informational and instrumental aspects within their reach then it becomes easy for them to pull through when they are in distress. If a student psychologically believes in themselves and understands that they have a shoulder to lean on or a person they can trust to solve their
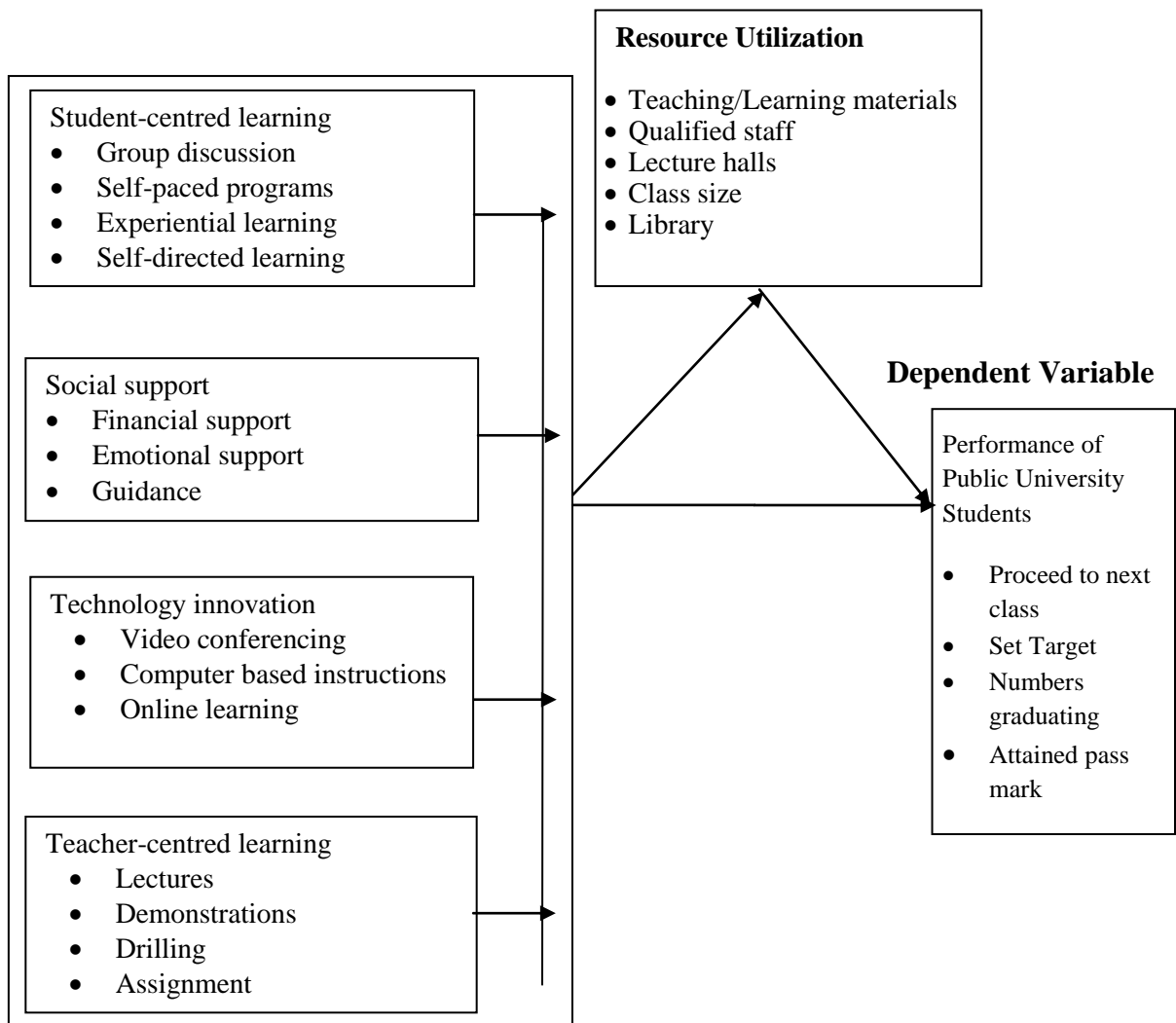
problems then working hard will be very practical for them. At the same time, having an environment around them that is conducive for learning will enable the student to perform.

2.6 Conceptual Framework

Creswell (2013) refers to a conceptual framework as an illustration depicting a study's concerns that a researcher is investigating and the association between the study's variables. A conceptual framework visually presents what the research is about and the outcome the researcher expects based on previous and similar studies and guiding theory. The conceptual framework adopted for this study is shown in Figure 2.1. From the diagram, performance of public university students is the dependent variable while independent variables comprise of student-centred learning, social support, technology innovation and teacher-centred learning. The mediating variable which is resource utilization could affect the dependent variable either negatively or positively depending on whether it would be over-utilized, underutilized or not utized at all. Simply put the independent variables affect the mediator (resource utilization), which in turn affect the dependent variable (student performance) either negatively or positively and also in the presence or absence of the mediator the independent variable still affects the dependent variable. The independent variables as well affect student academic performance directly in that if they are not utilized in the right manner then they will affect academic performance of the students.

Independent Variables   **Mediating Variable**

Implementation of leaning strategies

Resource Utilization

- Teaching/Learning materials
- Qualified staff
- Lecture halls
- Class size
- Library

Student-centred learning
- Group discussion
- Self-paced programs
- Experiential learning
- Self-directed learning

Dependent Variable

Social support
- Financial support
- Emotional support
- Guidance

Performance of Public University Students

- Proceed to next class
- Set Target
- Numbers graduating
- Attained pass mark

Technology innovation
- Video conferencing
- Computer based instructions
- Online learning

Teacher-centred learning
- Lectures
- Demonstrations
- Drilling
- Assignment

Figure 2.1 Conceptual Framework

Source: Author, (2022)

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents research design, area of study, target population, sampling frame, sampling techniques, data collection instruments, instrument reliability and validity and procedures for data analysis.

3.2 Research Design

Research design is defined as the structure of the research project. Wayne (2013) posits that research design is a scientific or systematic process where new knowledge is discovered and used in the interpretation of facts, revision of theories in addressing a research problem. According to Hilde (2017) he argues that research design is a framework forming the basis of a study's answers to research questions. In this study, the researcher employed the explanatory research design which addressed the problem of student academic performance. The design was on the verge of unveiling the problem of student academc performance through the implementation of learning strategies and resource utilization. As Grey (2014) argues, explanatory research design is aimed at explaining and accounting for descriptive information. Whereas descriptive research ask "what" questions, explanatory research asks "how" and "why" questions. Grey (2014) adds that explanatory studies look for reasons and causes, providing evidence supporting or refuting predictions or explanations. Additionally, explanatory studies are carried out to report and discover associations between various aspects of a studied phenomenon.

3.3 Study Area

The study was carried out in the nine public universities from the existing thirty-one public universities in Kenya. The study was carried out in the nine public universities as follows: Technical University of Kenya (TUK) in Nairobi County, Kenyatta University (KU) in Nairobi County, Kisii University (KSU) in Kisii County, Jomo Kenyatta University of Science and Technology (JKUAT) in Kiambu County, Maseno University (MU) in Kisumu County, Maasai Mara University (MMU) in Narok County, Egerton University (EU) in Nakuru County , Moi University (MU) in Uasin Gishu County, and Jaramogi Oginga Odinga University of Science and Technology (JOOUST) in Siaya County.

3.4 Target Population

A target population is defined as the group specifically relevant to the study. According to Mugenda and Mugenda (2013), a population is referred to as a group of objects or individuals having similar characteristics or form. The target populations for the study was arrived at using Yamane (1973) which constituted 4,343 full time teaching staff drawn from 9 public universities in Kenya as shown in Table 3.1.

Table 3.1 Target Population

Target	Number
Teaching staff	4343
Total	4343

3.5 Sample Size and Sampling Techniques

The choice of sampling methods and sample size determination are significant in applied

statistics since they allow the researcher to make correct inferences. When the sample

size is too small, it may fail to yield expected relations or effects. Alternatively, with a

sample size that is too large, the study's complexity will be increased which would result

to inaccuracy of findings.

3.5.1 Sample Size

The sample size is important in empirical studies whereby the objective is to make

conclusions about the population from the selected sample. Mugenda and Mugenda

(2013) argue that in instances where the population is below 10,000, the sample size

should be selected between a 10% to 30% representation therefore 10% is considered

appropriate for analysis. In this study, the sample size of public universities was arrived

at by using Mugenda and Mugenda (2013) approximation. The formula by Yamane

(1973) was applied in sample size determination of teaching staff in the 9 universities and

in each university where the size of the population is known. The sample size of public

Universities is given as below:

31 public Universities in Kenya
Mugenda and Mugenda (2013)

$$\frac{30}{100} \quad X \quad 31 \quad = 9.3 \text{ universities} \quad = 9 \text{ universities}$$

Sample size of teaching staff
Yamane (1973)

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

N= population size = 4,343

 n= sample size

 e= standard error; acceptable level is 0.05.

$= 4343/ \{1+4343(0.05)^2\}$

 4343/ (1+11.86) =366

Hence 366 teaching staff as shown in Table 3.2.

Table 3.2 The Sample Size

Target	Sample size
Teaching staff	366
Total	366

3.5.2 Sampling Techniques

In this study, simple random sampling was used to determine the sample size. Nine universities were selected randomly by picking pieces of paper containing the names of the universities out of the thirty one existing universities and those are the ones that were used for data analysis. Then the researcher also picked the respondents using simple random sampling from each selected university. The Yamane formular was used to determine the number of respondents per university for the nine universitites.The researcher visited physically the departments and asked for the full time teaching staff list where random sampling was used to select the names. This is because part time teaching staff were not reliablie to get since they did not have physical offices and contacting them would be difficult.

3.6 Data Collection Tools

In this study, a questionnaires were the primary instrument for data collection that were administered by the researcher. According to Creswell (2014), a questionnaires is defined as a written tool presenting participants with statements of questions to which they react by either selecting a response from provided statement or providing their written answers. Creswell (2014) adds that a questionnaires is utilized when collecting data on a phenomenon that is not observable directly for instance opinions, interests, inner experiences and values since they have a higher convenience compared to observation. There are various merits of using a questionnaire such as; it can be administered to a large group of participants, participants can fill the instrument when convenient to them, questionnaire items can be answered without following a specific order, questions can be skipped, several sessions can be taken in answering questionnaire items, comments can be written, and time and cost involved in questionnaire use is less compared with interviews. The researcher took the questionnaire to each respondents in the respective universities and gave them to fill out after which a date was agreed upon on when to collect the filled questionnaires.

3.6.1 Pilot testing of Instruments

In order to test the instrument, a pilot study was conducted in two universities which are University of Kabianga and Masinde Muliro University that were randomly selected and are not among the selected universities for study. Questionnaires were given to the respondent who are teaching staff of those universities to fill in the researcher's presence to determine if they could encounter any challenge or needed clarification on some items. In University of Kabianga I used Mugenda and Mugenda (2013) to get the sample size of

14 participants. In Masinde Muliro I applied the same Mugenda and Mugenda (2013) and got a sample size of 32 that totaled to 46. After distributing the questionnaires I got back 36 questionnaires which represent 78% and 10 were not returned representing 22%. The instruments were tested for reliability and had a Cronbach α 0f .760 meaning the data was reliable. Overall, pilot studies are used by researchers for the evaluation of adequacy of procedures and methods to be applied in a study (Polit & Beck, 2017). Pilot studies provide researchers with "opportunity of practice", allowing them to address both logistical topics for instance how the study is conducted and substantive topics for instance refinement of adopted methodology.

3.6.2 Reliability and Validity

Bajpai and Bajpai (2014) note that instrument validity and reliability is the tendency of measuring correctness and relevance. Bajpai and Bajpai (2014) add that validity and reliability form psychometric aspects of measurement which are instrumental in estimation of accuracy and adequacy in scientific research.

3.6.3 Reliability

According to Heale and Twycross (2015), reliability is defined as the assessment of consistency between a variable's multiple measurements. Mohajan (2017) defined reliability as "the extent to which measurements are repeatable when different people perform the measurement on different occasion, under different condition, supposedly with alternative instruments which measure the construct or skill". Similarly, it can be delineated as the measure of a construct's dependability or consistency. Cronbach's alpha coefficient was used to determine the instrument's internal consistency and its overall reliability of each factor of productivity values. Generally, a value of $\alpha > 0.7$ is

acknowledged by researchers as reliable for data sets where α is the reliability test item. The test-retest approach was utilized in testing reliability.

3.6.4 Validity

Validity is referred to as the extent that obtained findings from data analysis represent the phenomena being studied. It is "the extent to which a measure adequately represents the underlying construct that it is supposed to measure" (Mohajan, 2017). It is very important in analyzing the appropriateness, meaningfulness and usefulness of a research study. Noble and Smith (2015) posits that validity is a quality ascribed to proposition or is a measurement of the degree to which propositions conform to establish truth or knowledge. Zohrabi (2013) also alludes to the fact that validity is an exercise whereby the researcher tries to explain truth of the study's findings. In this study, content validity was used. The researcher determined the instrument's content validity by discussing the questionnaire items with supervisors. The feedback given by them aided the researcher in improving the research instrument's validity whereby necessary amendments were made. The instruments were not only used in the collection of data from participants but also used in cross-checking correctness of collected data.

In the study, Kaiser-Meyer-Olkin (KMO) measures of sampling adequacyand Bartlett's test of sphericity were utilized in testing existence of correlation between the study's variables. A KMO of between 0.6-1 indicate that the sample size is adequate for factor analysis. The researcher used factor analysis to determine whether the items in all sections of the instrument loaded into categories as expected. The eigen value of a factor represents the amount of the total variance explained by that factor. In factor analysis, the remarkable factors having eigenvalue greater than one are retained. Rotation makes

maximimum loading of the variables onto one factor and it minimizes the loadings onto the others. This aims to help when it comes to interpreting what the factors represent. The researcher applied Varimax rotation in validation of the constructs which are distinct in implementation of learning strategy implementation. In Varimax rotation the method helps to detect factors which are associated to few variables and minimizes the number of variables that have high loadings on a given factor.

3.7 Measures of Variables

Dependent and independent variables are based on constructs and used 5 point likert scales. The measurements were adopted from previous studies and 5 items on student-centred learning were adopted from Wilson et al. (2019), 4 items on social support were adopted from Raelin et al. (2014), 6 items on technology innovation were adopted from Bergman (2016) 6 items on teacher-centred learning were adopted from Zhao *et al.* (2014) 6 items on student performance were adopted from Rossi (2017) and 4 items of resource utilization adopted from Agnetta et al. (2022) were modified slightly for this study.

3.8 Data Analysis and Presentation

Data was organized methodically in a way that facilitated analysis. In data analysis, the data was prepared, coded, edited and cleaned which facilitated processing. Data analysis was carried out descriptively and inferentially with the help of SPSS version 23 Software. Multiple linear regression as predictive analysis was used in explaining the influence between the dependent and independent variables (Kenton, 2019). Further, the researcher used regression coefficients in explaining the nature of relationship between dependent and independent variables. In determining the effect of implementation of learning

strategies on students' performance, the study utilized multiple regression analysis for hypothesis testing.

R square (coefficient of determination) was used by the researcher to measure explanatory power, showing how the dependent variable is explained by independent variables. Adjusted R square was utilized to measure independent variables' explanatory power in the dependent variable's exclusion. The F-test was used further to determine the validity of the model while R squared measured the model's goodness of fit. The nature of association between independent and dependent variables was explained by regression coefficient summary. ANOVA (F statistics) measured the model's goodness of fit.

3.8.1 Model Specification

Baron and Kenny (1996) used a four step approach to test for mediation effect of resource utilization (M) by understanding the relationship between the dependent variable (Y) and the independent variable (X) through the mediator (M). In this study the researcher seeks to understand how implementation of learning strategies affects performance of students (direct effect) and through resource utilization (indirect effect). The regression model used in this study is given as;

$$Y=\beta_0+\beta_1 X1+\beta_2 X2+\beta_3 X3+\beta_4 X4+\varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

$$M=\beta_0+\beta_1 X1+\beta_2 X2+\beta_3 X3+\beta_4 X4+\varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(2)$$

$$Y=\beta_0+\beta_1 X1+\beta_2 X2+\beta_3 X3+\beta_4 X4+\beta_5 X5+\varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \ldots\ldots(3)$$

Step 1- The first step was a simple regression analysis conducted to test the direct effect of X on Y for the significance of path c

Step 2 -The second step was a simple regression analysis conducted to test the indirect effect of X on M for the significance of path a

Step 3 -The third step was to conduct a simple regression analysis to test the indirect effect of M on Y for the significance of path b

Step 4- The fourth step was to conduct a multiple regression analysis to test the direct and indirect effects of X and M on Y for the significance of path c, a and b.

β_0=Constant, β_1, β_2, β_3, β_4.... β_5=Coefficients

Y=Students' Performance

X1= Student-Centered learning

X2= Social Support

X3= Technology Innovation

X4= Teacher-Centered learning

X5= Resource Utilization

3.9 Diagnostic Tests

Diagnostic tests is important in finding and validating relationship between dependent and independent variables. They are tools that asses the compliance of a model to its assumption and investigate if there is a single of group of observations that are not well represented in the model appropriately represents the data of their study.It covers the major assumptions of regression, visual and statistical diagnostic tests and corrective actions.

3.9.1 Normality Test

Casella and Berger (2021) posits that the assumption is centered on the normal distribution shape and it provides the researcher with knowledge on expected values. Heimann and Isaacs (2018) posits that the assumption is centered on the normal distribution shape and it provides the researcher with knowledge on expected values. Normal distributions take the form of a symmetric bell-shaped curve. It was necessary for data to be cleaned to check this assumption through outlier identification. Normal distributions take the shape of a symmetric bell-shaped curve. The standard normal distribution also called z-scores or standardized data, is one with a mean of 0 and a standard deviation of 1. Normality is assessed visually by looking at histogram of frequencies or by looking at normal probability plot output. When testing for normality Probabilities > 0.05 indicate that the data are normal. Probabilities < 0.05 indicate that the data are NOT normal.

3.9.2 Linearity Tests

James *et al*. (2021) surmises that multiple regression accurately estimates the association between independent and dependent variables in instances when the association is linear. James *et al*. (2021) argue that when this assumption is violated, it threatens the meaning of estimated parameters in the analysis. Fahrmeir *et al*. (2022), argues that multiple regression accurately provides estimates of the association between independent and dependent variables when the association is linear. When there is no linearity, a plot of standardized residuals against fitted estimates (standardized values) of the dependent variable should reveal a random pattern.

3.9.3 Homoscedasticity

Rosopa *et al.* (2013) further argue that the assumption of homoscedasticity points to equal error variance across all independent variables levels Fahrmeir *et al.* (2022) further argue that the assumption of homoscedasticity points to equal error variance across all independent variables levels. This means that in this study, the assumption was that errors are consistently spread out between variables.

3.9.4 Multicollinearity

Daoud (2017) surmises that multicollinearity arises when various independent variables correlate highly with one another, or when an independent variable is a near linear combination to other independent variables. Heimann & Isaacs (2018) surmises that multicollinearity arises when various independent variables correlate highly with one another, or when an independent variable is a near linear combination to other independent variables. Daoud (2017) adds that if more variables correlate (overlap), researchers are less able to separate the effects of variables. Collinearity diagnostics are implemented to measure the extent that independent variables are independent of each other. In this study, diagnostics were carried out through Tolerance and Variance Inflation Factors (VIF) statistics. According to Kim (2019), the rule of thumb for a large VIF value is 10 and tolerance should be greater than 0.2. Additionally, small values for tolerance and large VIF values show the presence of multicollinearity.

3.10 Ethical Considerations

A letter of permission was obtained by the researcher from the School of Business & Management (SBM), University of Eldoret and a research permit from the National

Council of Science & Technology (NCST), to allow the study to proceed to data collection.

The researcher ensured that confidentiality of respondents was guaranteed and maintained, with the respondents' identity kept secret. Further, personal identifiers in respondents' feedback was only used for the study's purpose and nothing more than that. Respondents' identity was not be revealed to any other source and the information given by them was treated confidentially.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter provides data analysis respective the study's objectives. Findings and interpretations are done and presented corresponding to the study's objectives. Data analysis was carried out both descriptively and inferentially. The researcher organized this chapter in the following sections: rate of response, demographic data, descriptive analysis, validity and reliability, correlation and regression analysis and discussion of findings.

4.2 Response Rate

The researcher administered 366 questionnaires in total. Of the administered questionnaires, 294 were filled and returned by the respondents and 72 were not returned. The return rate represents 80% of questionnaires. The returned questionnaires were used to interpret the results. A response rate of over 60% is good and hence acceptable for analysis. Nyanjom (2013) argues that a 75% response rate is excellent and adequately represents the population in studying phenomena. Hence the 80% response rate in this study was adequate. Table 4.1 shows the rate of response.

Table 4.1 Questionnaire Rate of Response

	Count	Percentage
Returned	294	80
Non-returned	72	20
Total	**366**	**100**

4.3 Demographic Information

Demographic information in this study was categorized as; age, education, programme and teaching experience as summarized in Table 4.2. With regard to respondents' ages, 168(57.1%), were over 40 years, 96(32.7%) were between 31 and 40 years and 30(10.2%) were between 20 and 30 years. The results showed that majority exceeded 40 years, hence would give adequate information on implementation of implementation of learning strategies.

Table 4.2 Demographic of the Respondents

Variable	Category	Frequency	Percent	Cumulative Percent
Age	20-30 years	30	10.2	10.2
	31-40 years	96	32.7	42.9
	>40 years	168	57.1	100.0
	Total	294	100.0	
Highest level of education	Diploma	0	0	**0**
	Degree	36	12.2	12.2
	Masters	120	40.8	53.1
	PhD	138	46.9	100.0
	Total	294	100.0	
Programme	Diploma	0	0	0
	Degree	168	57.1	57.1
	Masters	42	14.3	71.4
	PhD	84	28.6	100.0
	Total	294	100.0	
Experience	<5 years	66	22.4	22.4
	5-10 years	114	38.8	61.2
	10-15 years	48	16.3	77.6
	15-20 years	30	10.2	87.8
	>20 years	36	12.2	100.0
	Total	294	100.0	

With regard to education, 138(46.9%) had attained PhD qualifications, 120(40.8%) had master's qualification and 36(12.2%) had bachelors' qualification. This implied that majority of the lecturers had above master's qualification and could adequately explain implementation of learning strategies implementation in public universities. On the programme taught, majority 168(57.1%) of the lecturers have been teaching the undergraduate students, with 84 (28.6%) teaching the PhD class and 42(14.3%) teaching masters students. This showed that most of the lecturers taught the undergraduate students. Finally, on the teaching experience 114 (38.8%) had been lecturing for between 5 and 10 years, with 48 (16.3%) for 10 to 15 years, while 66 (22.4%) for less than 5 years, (36)12.2% for more than 20 years and (30) 10.2% for between 15 and 20 years. This indicated that majority of the lecturers had been teaching in the public universities for more than 5 years.

4.4 Descriptive Analysis

The study used descriptive analysis in describing the data's basic aspects to provide a summary about the sample population. During the study the independent variable was implementation of implementation of strategies measured using student- centered learning, social support, technology innovation and teacher-centered learning strategies. The study's variables were framed in five point Likert scale statements, where respondents were required to make choices from the scores. The statement scores were; SA (Strongly Agree), A (Agree), U (Undecided), D (Disagree) and SD (Strongly Disagree). Respondents' statement scoring explained the independent variables. Subsequently, means and standard deviations were used in descriptive analysis and presented in tables. Variable distribution was considered normal if kurtosis and skewness

was between -2.0 and 3.0. In this study, the values for kurtosis and skewness were within acceptable range, hence normality was met.

4.4.1 Student–Centred Learning

On the student-centered method, based on the means majority of the respondents agreed that there were group discussions to ensure effective students' performance (3.86) and skills were developed during training improves students' performance (4.20). The student-centered method created cooperation amongst the students enhances student performance (4.39) and students master concepts well during self-directed learning (3.86). It also makes an attitude change towards learning that improved students' performance (4.33) and students enjoyed self-paced learning which improves their performance (3.55). The student centered creates experiential learning over time enhances students' performance (4.27). The student-centered variable standard deviations were between 0.73 and 1.18 as indicated in Table 4.3.

Table 4.3 Student-Centered Learning

	Mean	Std. Dev	Skew ness	Kurtosis
There are group discussions to ensure effective students' performance	3.86	0.97	-0.79	0.30
Skills developed during training improves students' performance	4.20	0.73	-1.29	2.69
Cooperation amongst students enhances student performance	4.39	0.85	-1.43	1.40
Students master concepts well during self-directed learning	3.86	1.18	-0.70	-0.52
Attitude change towards learning improves students' performance	4.33	0.74	-0.91	0.43
Students enjoy self-paced learning which improves their performance	3.55	1.01	-0.79	0.01
Experiential learning over time enhances students' performance	4.27	0.83	-1.62	3.79

4.4.2 Social Support

With regard to the means of social support variable, majority of respondents agreed that guardian support was evident through raising fees for the students (4.06), with dean of students assisting in the management of students' discipline (3.53) and lecturers were involved in the guidance of students toward right direction (3.57). The social support enabled students need counseling from peers for consolation when they were upset (3.90) and course lecturers provided full support to their students for motivation (3.59). Respondents were not sure whether social support makes the students rely on counsellors to help them relax when they are tensed (3.20), school management encouraged students in their worst or weak points (3.33) and counselors assisted students to keep good company in order to perform (3.41). Standard deviations were between 0.87 and 1.26 as shown in Table 4.4.

Table 4.4 Social Support

	Mean	Std. Dev	Skew	Kurtosis
Guardian support is evident through raising fees for the students	4.06	0.87	-0.69	-0.18
The Dean of students assists in the management of students' discipline	3.53	1.13	-0.89	-0.05
Lecturers are involved in the guidance of students toward right direction	3.57	1.20	-0.86	-0.12
Students rely on Counselors to help them relax when they are tensed	3.20	1.14	-0.16	-0.70
The school management encourage students in their worst or weak points	3.33	1.30	-0.46	-1.01
Students need counseling from peers for consolation when they are upset	3.90	0.91	-0.94	0.99
Counselors assist students to keep good company in order to perform	3.41	1.23	-0.62	-0.49
Course lecturers provide full support to their students for motivation	3.59	1.26	-0.61	-0.71

4.4.3 Technology Innovation

On technology innovation variable, most of the respondents agreed that more focus on technology improvement enhances job market potential with a mean of (4.08) and online learning had provided an opportunity for busy students to learn (3.92). Computer based programs aid students to adapt to changing technology (4.24), investment in technology opens a potential for student scaling (3.94) and technology aims at knowledge development and student's performance (3.92). The respondents were undecided whether video conferencing was used by distant learning students to learn (3.31). The standard deviations range between 0.94 and 1.29 as presented in Table 4.5.

Table 4.5 Technology Innovation

	Mean	Std. Dev	Skewness	Kurtosis
More focus on technology improvement enhances job market potential	4.08	0.95	-1.63	3.03
Online learning has provided an opportunity for busy students to learn	3.92	1.07	-1.26	1.30
Computer based programs aid students to adapt to changing technology	4.24	0.94	-1.85	3.94
Video conferencing is used by distant learning students to learn	3.31	1.31	-0.36	-0.89
Investment in technology opens a potential for student scaling	3.94	1.29	-1.22	0.36
Technology aims at knowledge development and student's performance	3.92	1.09	-1.19	1.04

4.4.4 Teacher–Centred Learning

On teacher-centered learning most of the respondents agreed that lecturers tailored the curriculum toward student needs with a mean of (3.73) and lecturers taught courses geared toward the job market (3.86). Lecturers taught students so that they can concentrate and perform (3.73), lecturers gave assignments to students which enabled

them to excel (4.20). Lecturers demonstrated in class to make students understand better (3.96) and lecturers participated in class discussions as it made students active (4.18). The curriculum content was not demonstrated more practically than theoretical (3.43). The results reveal standard deviations ranging between 0.76 and 1.16 as indicated in Table 4.6.

Table 4.6 Teacher-Centered Learning

	Mean	Std. Dev	Skewness	Kurtosis
Lecturers tailor the curriculum toward student needs	3.73	1.12	-1.04	0.28
Curriculum content is demonstrated more practically than theoretical	3.43	1.16	-0.42	-0.75
Lecturers teach courses geared toward the job market	3.86	1.07	-0.92	0.32
Lecturers teach students so that they concentrate and perform	3.73	0.92	-0.87	0.55
Lecturers give assignments to students which enable them excel	4.20	0.76	-1.79	5.74
Lecturers demonstrate in class to make students understand better	3.96	0.95	-1.08	1.01
Lecturers participate in class discussions as it makes students active	4.18	0.94	-1.41	1.91

4.5 Performance of Students

The study's dependent variable was students' performance which was measured using five point Likert scale and seven statements. Standard deviation and mean were utilized in summarizing respondents' responses as shown in Table 4.7. The means of the seven statements elucidating performance of students were in agreement that there was high students' achievement in our institution (3.57) and student performance reflected overall

university objective (3.96). There was high graduate rate at the end of our courses (3.90) and ranking of our institution is among the top performing institution (3.63). Majority of our students had high profile jobs in government sector (3.80). There was no positive public perception about our institution (3.24) and the potential employers came to interview students more often (3.43). The descriptive statistics for performance of student's standard deviations ranged between 0.78 and 1.12.

Table 4.7 Performance of Students

	Mean	Std. Deviation	Skewness	Kurtosis
There is high students' achievement in our institution	3.57	0.91	-1.05	1.04
Student performance reflects overall university objective	3.96	0.93	-1.01	1.03
There is high graduate rate at the end of our courses	3.90	0.82	-1.41	2.82
Ranking of our institution is among the top performing institution	3.63	1.08	-0.59	-0.68
There is a positive public perception about our institution	3.24	1.12	-0.58	-0.51
Majority of our students have high profile jobs in government sector	3.80	0.78	-0.40	-0.09
Potential employers come to interview our students more often	3.43	0.93	-0.80	0.92

4.6 Resource Utilization

The mediator variable in the study was resource utilization. This was measured by a five point Likert scale and seven statements. The researcher aimed to determine the extent of agreement by the respondents on the provided statements with regard to resource utilization. Responses were summarized using means and standard deviations as presented in Table 4.8. Consequently, respondents were uncertain that institution had right systems that assist in enhancing student performance (3.24) and institution had

information systems like computers and internet usage (3.47). The institution had automated student feedback mechanism (2.98), institution had right software that manages student's documentation (3.06) and institution had teaching and learning materials to assist students' study (3.31). The existing policies regulated teaching load to avoid overloading (3.04) and institution had adequate lecture halls that accommodate required capacity (2.49). The institution admitted the correct class size as per existing facilities (2.41) and institution had materials in class adequate for courses and students taught (2.71). The standard deviations ranged between 1.13 and 1.46.

Table 4.8 Resource Utilization

	Mean	Std. Dev.	Skew	Kurtosis
Institution has right systems that assist in enhancing student performance	3.24	1.34	-0.30	-1.08
The institution has information systems like computers and internet usage	3.47	1.28	-0.64	-0.83
The institution has automated student feedback mechanisms	2.98	1.24	-0.22	-1.11
The institution has right software that manages student's documentatio	3.06	1.13	-0.04	-1.18
Institution has teaching and learning materials to assist students' study	3.31	1.18	-0.54	-0.70
The existing policies regulates teaching load to avoid overloading	3.04	1.42	-0.12	-1.33
Institution has adequate lecture halls that accommodate required capacity	2.49	1.42	0.52	-1.15
Institution admits the correct class size as per existing facilities	2.41	1.36	0.42	-1.28
Institution has materials in class adequate for courses and students taught	2.71	1.46	0.23	-1.43

4.7 Reliability Analysis

Research instruments are considered reliable when after administration to varying groups of participants in the population sample, there is consistency in results. In this study, Cronbach's alpha was adopted in assessment of internal consistency (homogeneity)

among items of the research instrument. Results from Cronbach's alpha analysis reveal the variables' coefficients as; student centered learning (.768), social support (.834), technology innovation (.856), teacher centered learning (.845), resource utilization (.907), and student performance (.772). The summation from these results was that all variables' Cronbach's coefficient was > 0.7. The highest observed coefficient was for resource utilization (0.907) and the lowest for student centered (0.768) as shown in Table 4.9. All instruments with Cronbach alpha greater than or equal to 0.7 mean that the instrument is valid.

Table 4.9 Reliability Statistics

	Cronbach's Alpha	**Number of Items**
Student-centred learning	.768	7
Social support	.834	8
Technology innovation	.856	6
Teacher-centred learning	.845	7
Utilization	.907	9
Student performance	.772	7
Overall	**.830**	**44**

The findings revealed that the Cronbach alpha was 0.830, which is due to the fact that all coefficients were greater than 0.7 when combined, hence they were all reliable. The high Cronbach alpha value for all variables is an indication that all items in the research instrument were consistent. The researcher utilized published articles and journals that have been conceptualized or tested empirically in development of items of the research instrument.

4.8 Validity of the Research Instrument

Validity refers to the degree that an instrument measures what it is meant to measure. Before the researcher administered the research instrument in data collection, supervisors were consulted and the items discussed. Due to the fact that the researcher personally administered the research instruments, respondents were encouraged to be expressive in their opinions, which ensured that the questions were clear. Opinions provided by respondents were adopted by the researcher in improving the instrument.

4.8.1 Rotated factor Matrix on Measurement Items for Student-Centred Learning

On the student-centered learning construct, two components had eigen values >1.0 and a 59.23% total variance as presented in Table 4.10. The findings also showed a KMO of 0.738 which is an indication of inter-correlation sufficiency, whereas the sphericity test was significant (Chi-square 585.8, p <0.05). The results showed that student-centered learning was factorially distinct and unidimensional, hence all items were loaded on two factors. All statements were retained, computed and renamed student for further analysis. The KMO of 0.738 showed that data was adequate for factor analysis.

Table 4.10 Rotated Factor Matrix on Measurement Items for Evaluating Student-Centered Learning

Survey Items	Component		
Student-Centered Learning	**1**	**2**	**3**
There are group discussions to ensure effective students' performance		.684	
Skills developed during training improves students' performance	.793		
Cooperation amongst students enhances student performance		.535	
Students master concepts well during self-directed learning		.790	
Attitude change towards learning improves students' performance	.713		
Students enjoy self-paced learning which improves their performance	.532	.533	
Experiential learning over time enhances students' performance	.791		
KMO	.738		
Chi-Square	585.79		
Bartlett's Test of Sphericity (df=21)	7		
Eigenvalues	.000	1.022	
% of Variance (59.263)	3.126	26.953	
	32.309		

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

4.8.2 Rotated Factor Matrix on Measurement Items for Social Support

On the social construct, three components had eigen values >1.0 and a 75.19% total variance as presented in Table 4.11. The findings also showed a KMO of 0.760 which was adequate for factor analysis. The sphericity test was significant (Chi-square 1027.22, p<0.05). Eight items were retained, computed and renamed support for further analysis.

Table 4.11 Rotated Factor Matrix on Measurement Items for Social Support

Survey Items	Component		
	1	2	3
Social Support			
Guardian support is evident through raising fees for the students			.906
The Dean of students assists in the management of students' discipline		.768	
Lecturers are involved in the guidance of students toward right direction	.905		
Students rely on Counselors to help them relax when they are tensed		.783	
The school management encourage students in their worst or weak points	.565	.664	
Students need counseling from peers for consolation when they are upset			.723
Counselors assist students to keep good company in order to perform		.598	
Course lecturers provide full support to their students for motivation	.907		
KMO	.760		
Chi-Square	1027.224		
Bartlett's Test of Sphericity (df=55)			
	.000		
Eigenvalues	27.677	26.666	20.847
% of Variance (75.191)	3.726	1.246	1.043

Extraction Method: Principal Component Analysis.

 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

4.8.3 Rotated Factor Matrix on Measurement Items for Technology Innovation

On the technology innovation construct, one component had eigen values >1.0 and a 60.413% total variance as presented in Table 4.12. The findings also showed a KMO of .735 which is an indication of inter-correlation sufficiency, whereas the sphericity test was significant (Chi-square = 979.187, p <0.05). The results showed that technology innovation was factorially distinct and unidimensional, hence all items were loaded on one factor. All statements were retained, computed and renamed technology for further analysis.

Table 4.12 Rotated Factor Matrix on Measurement Items for Technology

Innovation

Survey Items	Component		
	1	2	3
Technology Innovation			
More focus on technology improvement enhances job market potential	.794		
Online learning has provided an opportunity for busy students to learn	.799		
Computer based programs aid students to adapt to changing technology	.798		
Video conferencing is used by distant learning students to learn	.569		
Investment in technology opens a potential for student scaling	.858		
Technology aims at knowledge development and student's performance	.813		
KMO	.735		
Chi-Square	979.187		
Bartlett's Test of Sphericity (df=15)	.000		
Eigenvalues	3.625		
% of Variance (60.413)	60.413		

Extraction Method: Principal Component Analysis.

 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

4.8.4 Rotated Factor Matrix on Measurement Items for Teacher-Centered Learning

On the teacher-centered learning construct, one component had eigen values >1.0 and a 53.818% total variance as presented in Table 4.13. The findings also showed a KMO of 0.755 and a sphericity test of Chi-square = 886.303, p<.05). All statements were retained, computed and renamed teacher for additional analysis.

Table 4.13 Rotated Factor Matrix on Measurement Items for Teacher-Centered

Learning

Survey Items	Component		
Teacher-Centered Learning	**1**	**2**	**3**
Lecturers tailor the curriculum toward student needs			
Curriculum content is demonstrated more practically than theoretical	.745		
Lecturers teach courses geared toward the job market	.759		
Lecturers teach students so that they concentrate and perform	.726		
Lecturers give assignments to students which enable them excel	.750		
Lecturers demonstrate in class to make students understand better	.814		
Lecturers participate in class discussions as it makes students active	.797		
KMO	.755		
Chi-Square	886.303		
Bartlett's Test of Sphericity (df=21)	.000		
Eigenvalues	3.767		
% of Variance (52.991)	53.818		

Extraction Method: Principal Component Analysis.

 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

4.8 Rotated factor matrix on Resource Utilization

On the resource utilization construct, two components had eigen values >1.0 and a

73.632% total variance as presented in Table 4.14. The findings also showed a KMO of

0.835 and sphericity test of Chi-square = 2008.27, p<.05). No statement was deleted.

The remaining four were retained, computed and renamed performance for further analysis.

Table 4.14 Rotated Factor Matrix on Resource Utilization

	Component	
	1	2
Institution has right systems that assist in enhancing studen		.783
The institution has information systems like computers and internet usage		.884
The institution has automated student feedback mechanisms		.654
The institution has right software that manages student's documentation		.817
Institution has teaching and learning materials to assist students' study		.664
The existing policies regulates teaching load to avoid overloading	.707	
Institution has adequate lecture halls that accommodate required capacity	.941	
Institution admits the correct class size as per existing facilities	.917	
Institution has materials in class adequate for courses and students taught	.843	
KMO	**.835**	
Approx. Chi-Square	2008.270	
Bartlett's Test of Sphericity (df=36)	**.000**	
Eigenvalues	5.184	1.442
% of Variance (73.632)	37.773	35.859

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

4.9 Rotated Factor Matrix on Student Performance Variable

Varimax rotation and factor analysis was carried out for validation of appropriateness and dimensionality of student performance. Eigen values were >1.00 and total variance was 62.21%. The results also showed a KMO of 0.695 which showed inter-correlation

sufficiency. The sphericity test was significant (Chi square 615.439, p <0.05). Seven statements that represented resource utilization were retained, computed and renamed utilization for analysis as shown in Table 4.15.

Table 4.15 Rotated Factor Matrix of Student Performance

	Component	
	1	2
There is high students achievement in our institution		.730
Student performance is a reflection of overall university objective		.810
There is high graduate rate at the end of our courses		.704
Ranking of our institution is among the top performing institution	.631	
There is a positive public perception about our institution	.874	
Majority of our students have high profile jobs in government sector	.523	
Potential employers come to interview our students more often	.717	
KMO	**.695**	
Bartlett's Test of Sphericity (df=21)	**.000**	
Approx. Chi-Square	615.439	1.129
		28.175
Eigenvalues	3.042	
% of Variance (62.210)	31.411	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

4.10 Correlation Analysis of the Variables

The researcher sought to determine the extent of the relationship between implementation of learning strategies and performance of students. Pearson's moment correlation was utilized in this case. Its appropriateness was due to the fact that all variables were of interval scale. The findings revealed that student-centered-learning significantly

influenced student performance (r=0.451, p =0.000) as seen in Table 4.16. This gives the implication that with increase in student-centered learning, subsequently, student performance improved.

Social support and student performance had positive significant association (r= 0. 607, p =0.000). Hence, an increase in social support positively influenced student performance. Technology innovation positively and significantly influenced student performance (r=0.498, p=0.00). Hence, an increase in technology positively influenced student performance.

The findings further revealed that teacher-centered learning positively and significantly influenced student performance (r =0. 582, p=0.000). This finding gave the summation that with thorough training, student performance improved. Resource utilization significantly influenced student performance (r =0.606, p=0.000). This implied that improvement in resource utilization positively influenced student performance. The study's results revealed that student-centered learning, social support, technology innovation, teacher-centered learning and resource utilization had a significant influence students' performance in public universities.

Table 4.16 Correlation Analysis

Performance		1	2	3	4	5	6
	Pearson Correlation	1	.451[**]	.607[**]	.498[**]	.582[**]	.606[**]
	Sig. (2-tailed)		.000	.000	.000	.000	.000
Student	Pearson Correlation	.451[**]	1	.557[**]	.569[**]	.564[**]	.405[**]
	Sig. (2-tailed)	.000		.000	.000	.000	.000
Support	Pearson Correlation	.607[**]	.557[**]	1	.607[**]	.704[**]	.323[**]
	Sig. (2-tailed)	.000	.000		.000	.000	.000
Technology	Pearson Correlation	.498[**]	.569[**]	.607[**]	1	.661[**]	.461[**]
	Sig. (2-tailed)	.000	.000	.000		.000	.000
Teaching	Pearson Correlation	.582[**]	.564[**]	.704[**]	.661[**]	1	.500[**]
	Sig. (2-tailed)	.000	.000	.000	.000		.000
Utilization	Pearson Correlation	.606[**]	.405[**]	.323[**]	.461[**]	.500[**]	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=294

4.11 Diagnostic Tests

Researchers utilize regression due to the fact that data adheres to parameters or assumptions such as; the level of data is interval, a linear relationship exists, distributions are normal, outliers are identified and omitted. Regression assumptions in this study were linearity, normality, collinearity and homoscedasticity. The aim of a diagnostic test is to develop predictiverelationship between the dependent (response) and independent (predictor)variables.

4.11.1 Normality Test

Kwak and Park (2019) posits that the presumption is centered on the normal distribution shape and provides the researcher with knowledge on expected values. This assumption was tested in the study through pieces of information using histograms of frequencies to visually evaluate normality. It was important for data cleaning to be done by identifying outliers. In order to assume normality the results have to have a mean of zero (0) and a standard deviation of one (1). The results were checked by visually looking at the shape of the histogram which was symmetrical and bell shaped evidence of normality. As elaborated by Kwak and Park (2019), normality was checked further through standardized residuals histograms. Histograms are delineated as graphs of residuals with superimposed normal curve. Figure 4.1 summarizes the result.
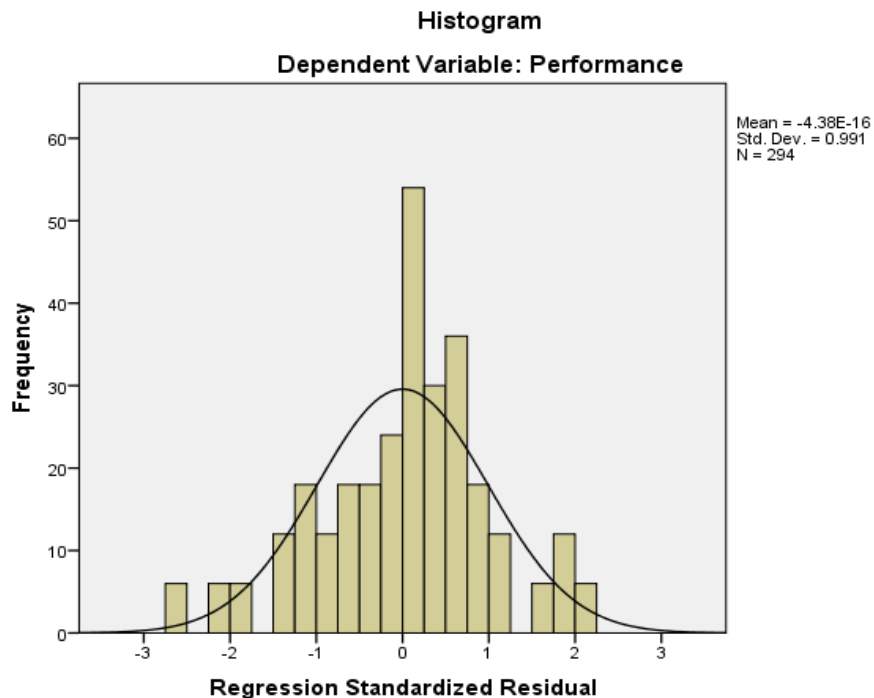
Figure 4.1 Normality Test

4.11.2 Linearity Test

Further in-depth analysis of residual and scatter plots provided in statistical software showed curvilinear vs. linear associations (James *et al.*, 2021). Residual plots showing standardized residuals vs. predicted values facilitated detection of linearity violations. James *et al.* (2021) posits that violation is identified with clustering or systematic patterns of residuals. Since the standardized residuals and predicted values followed a linear form rather than a random pattern from the observation then linearity is said to exist. Linearity was established using residual plots that showed standardized residuals and predicted values as seen in Figure 4.2.
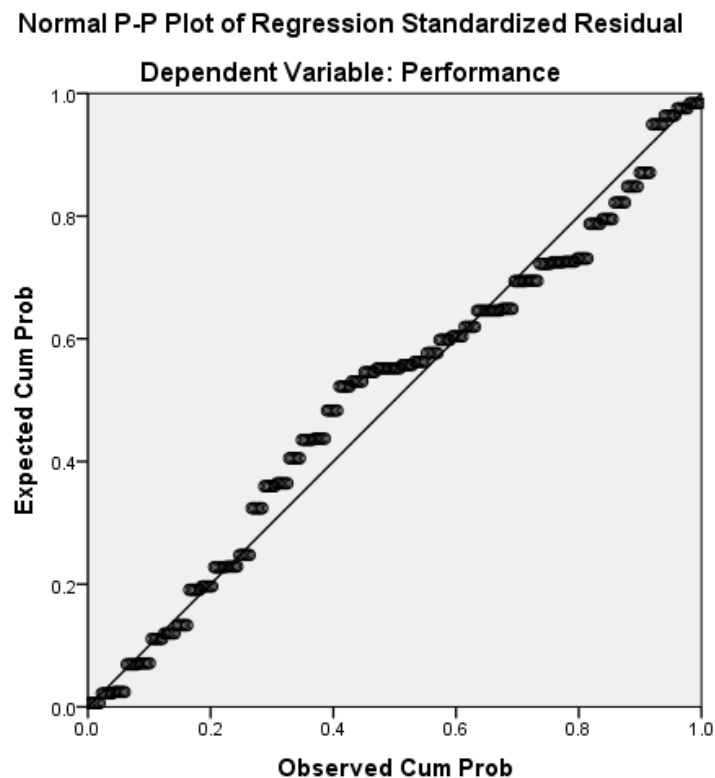
Figure 4.2 Linearity Test

4.11.3 Homoscedasticity Test

Scatterplots of residuals were specifically used in this study to examine homoscedasticity. According to Yang and Chen (2019), heteroscedasticity is indicated by uneven scatter. Butterfly and fan forms are also common violation patterns. Scatterplots revealed examples of homoscedasticity and heteroscedasticity. In this study, homoscedasticity was examined through the standardized residual scatter plot shown in Figure 4.3.
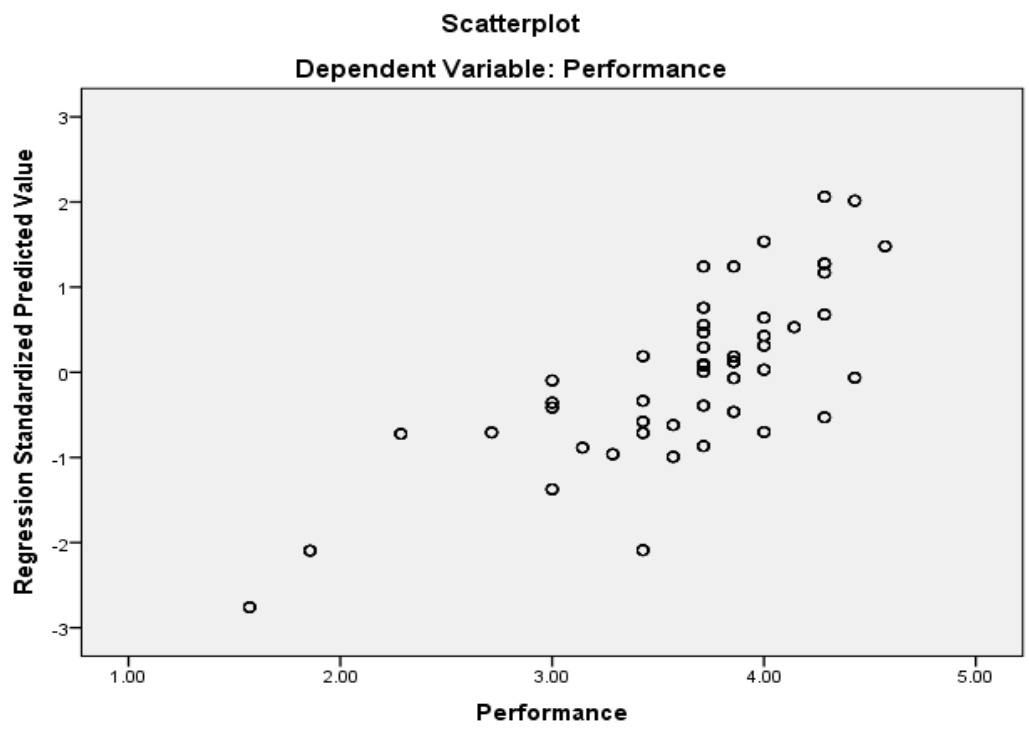
Figure 4.3 Homoscedasticity Test

The findings revealed whether there was concentration of standardized residuals in the center (around 0) and whether it was a rectangular distribution. It is evident that standardized residuals were distributed around the centre closer to zero and portrayed a rectangular shape. This indicated that residual variance about dependent variable scores are similar, which showed that there was no problem of homoscedasticity.

4.11.4 Multicolinearity Test

Statistical software have collonearity diagnostics which the researcher used in measuring the extent that independent variables are independent of each other. Variance inflation factors and tolerance statistics were utilized in carrying out this diagnosis. The general rule for large VIF value is 10 and tolerance is greater than 0.2 (Shrestha, 2020) as seen in Table 4.17. The tolerance and VIF for student-centred learning is (Tolerance .575 and VIF 1.738), for Social Support (Tolerance is .440 and VIF 2.271), for Technology innovation (Tolerance .471 and VIF 2.122), Teacher centred learning (Tolerance is .373 and VIF is 2.678) and finally for resource utilization is (Tolerance is .697 and VIF is 1.435). According to Shrestha (2020), small tolerance values and large VIF values reveal that there is multicollinearity. From the study it does indicate that there were no values of VIF greater than 10 and hence there was no multicollinearity.

Table 4.17 Multicolineary Test

Model	Collinearity Statistics	
	Tolerance	VIF
. Student	.575	1.738
Support	.440	2.271
Technology	.471	2.122
Teacher	.373	2.678
Utilization	.697	1.435

a. Dependent Variable: Performance

4.12 Regression Analysis Results

The researcher used multiple regression analysis to explain the effect of independent variable (implementation of learning strategies) on the dependent variable (students'academic performance). The nature of association between independent and dependent variables was explained using regression coefficient summary. The study used Mutiple regression analysis to test the first four null hypotheses as summarized in Table 4.18 of the results. R-Square or the coefficient of determination is the proportion of variance in the dependent variable (Student academic performance) which can be predicted from the independent variables (student centred learning, social support, technology innovation, teacher centrted learning and resource utilization). The findings indicates that a value of 52.5% of the variance in the dependent variable (Student academic performance)can be predicted from the independent variables student centred learning, social support, technology innovation, teacher centred learning and resource utilization. This is an overall measure of the strength of association, and does not reflect the extent to which any particular independent variable is associated with the dependent variable.

The change statistics were used to test whether the change in adjusted R^2 is significant using the F-ratio of the independent variables. The regression model with learning strategies implementation as a predictor was significant and that there was a significant relationship between implementation of learning strategies and students' academic performance.

4.12.1 Student Centered Learning

In the regression analysis student centred learning (β=.468, p=0.000) it means it is statistically significant meaning that the student academic performance increases when student centred learning increases by a unit. From the regression models, (R^2) for implementation of learning strategies variables student centred learning accounts for 20.3% change in students academic performance. The p values of student centred leanrning associated with F- ratio of (74.58) p=0.000 is relatively small compared to alpha value α= 0.05 meaning the independent variable reliably predict the independent variable. Therefore, the null hypotheses that student centred learning has no significant effect on student academic performance is rejected.

4.12.2 Social Support

In the regression analysis social support (β=.481, p=0.000) it means it is statistically significant meaning that the student academic performance increases when social support increases by a unit. From the regression models, (R^2) for implementation of learning strategies variables social support accounts for 36.9%, change in students academic performance. The p values of social support associated with F- ratio of (170.64) p=0.000 is relatively small compared to alpha value α= 0.05 meaning the independent variable reliably predict the independent variable. Therefore the null hypotheses that social support has no significant effect on student academic performance is rejected.

4.12.3 Technology Innovation

In the regression analysis technology innovation (β=.358, p=0.000) it means it is statistically significant meaning that the student academic performance increases when technology innovation increases by a unit. From the regression models, (R^2) for implementation of learning strategies variables technology innovation accounts for 24.8%, change in students academic performance. The p values of technology innovation associated with F- ratio of 96.15, p=0.000 is relatively small compared to alpha value α= 0.05 meaning the independent variable reliably predict the independent variable. Therefore the null hypotheses that technology innovation has no significant effect on student academic performance is rejected.

4.12.4 Teacher Centred Learning

In the regression analysis teacher centred learning (β=.497, p=0.000) it means it is statistically significant meaning that the student academic performance increases when teacher centred learning increases by a unit. From the regression models, (R^2) for implementation of learning strategies variables teacher centred learning accounts for 33.9% change in students academic performance. The p values of teacher centred learning associated with F- ratio of 149.43, p=0.000 is relatively small compared to alpha value α= 0.05 meaning the independent variable reliably predict the independent variable. Therefore the null hypotheses that teacher centred learning has no significant effect on student academic performance is rejected.

4.12.5 Resource Utilization

In the regression analysis resource utilization (β=.372, p=0.000) it means it is statistically significant meaning that the student academic performance increases when resource utilization increases by a unit. From the regression models, (R^2) for implementation of learning strategies variables resource utilization accounts for 36.7% change in students academic performance. The p values of resource utilization associated with F- ratio of 169.60, p=0.000 is relatively small compared to alpha value α= 0.05 meaning the independent variable reliably predict the independent variable. Therefore the null hypotheses that resource utilization has no significant effect on student academic performance is rejected

Table 4.18: Linear Regression Results

	Variable				
	Student	**Support**	**Technology**	**Teacher**	**Utilization**
Constant	1.745 (.223)	1.930(.135)	2.249(.146)	1.724(.160)	2.542(.089)
Coefficients	.468 (.054)*	.481(.037)*	.358(.037)*	.497(.041)*	.372 (.029)*
R Square	.203	.369	.248	.339	.367
Adjusted R Square	.201	.367	.245	.336	0.365
R Square Change	.203	.369	.248	.339	0.367
F	74.583	170.635	96.150	149.434	169.60
Sig.	.000	.000	.000	.000	.000

*significant at 0.05

4.13   Hypotheses Testing

The β coefficients for implementation of learning strategies were generated to test the study's hypotheses. The contribution of implementation of learning strategies on the model was measured using the t-test where the null hypothesis is either rejected or accepted.

H0$_1$:   There is no significant effect of student-centered learning strategy on the academic performance of students in Kenyan public universities

The results on table 4.18 revealed a significant positive association between student-centered learning and academic performance of students (β_1=.468 and p<0.05). The p value was <0.05, hence the null hypothesis (**Ho$_1$**) was rejected. Student-centered learning significantly and positively influenced academic performance of students in public universities.

H0$_2$:   There is no significant effect of social support on the academic performance of students in Kenyan public universities

The results on table 4.18 revealed a significant positive association between social support and performance of students (β_2=.481 and p<0.05). The p value was <0.05, hence the null hypothesis (**Ho$_2$**) was rejected. Social support significantly and positively influenced academic performance of students in public universities.

H0$_3$:   There is no significant effect of technology innovation on the academic performance of students in Kenyan public universities

The results on table 4.18 revealed a significant positive association between technology innovation and performance of students (β_3=.358 and p<0.05). The p value was <0.05,

hence the null hypothesis (**Ho₃**) was rejected. Technology innovation significantly and positively influenced academic performance of students in public universities.

H0₄: **There is no significant effect of teacher-centered learning on the academic performance of students in Kenyan public universities**

The results on table 4.18 revealed a significant positive association between teacher-centered learning and performance of students (β_4=.497 and p<0.05). The p value was <0.05, hence the null hypothesis (**Ho₄**) was not accepted. Teacher-centered learning significantly and positively influenced academic performance of students in public universities.

4.14 Mediating Effect of Resource Utilization on the Relationsthip between Implementation of Learning Strategies and Academic Performance of Students

The study sought to determine the mediation of resource utilization on the association between implementation of learning strategies and students' performance. Independent variables signifying learning strategies were calculated and denoted as `StrIP`. Literature established that learning strategies have an influence on students' performance, but the mechanism is not known. Hence the study's hypothesis was that resource utilization was one mechanism. Using Baron and Kenny (1986) model the findings were as follows: There was significant association between implementation of learning strategies and student academic performance as shown in figure 4.4 and depicted in Table 4.19. The initial part of output shows all hypothesized variables – the dependent variable student academic performance Per→ (Y), independent variable implementation of learning

strategies ($\texttt{StrIP}$) $\rightarrow$ (X) and mediator resource utilization (Ruti) $\rightarrow$ (M). The mediation of resource utilization on the association between implementation of learning strategies and students' performance was tested using total, direct and indirect effect.
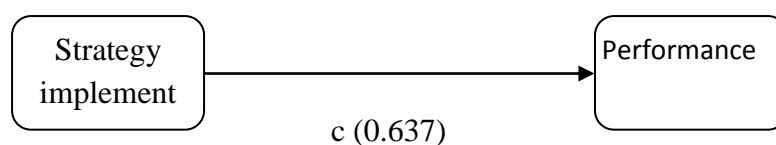
4.14.1 Total Effect

The total effect was determined by assessing the association between implementation of learning strategies and student academic performance as shown in Table 4.19. The results showed R^2=0.4116 and positive significance (p<0.000) an indication that implementation of learning strategies predict 41.16% of academic performance of students. In the model, regression of implementation of learning strategies on student performance with mediator ignored was significant ($\beta = 0.637$, t (292) = 14.29, p <.000).

Table 4.19 Total Effect Model (Outcome: Performance)

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6415	.4116	.2221	204.227	1.000	292.0	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	1.2017	.1733	6.9336	.0000	.8606	1.5428
StrIP	.6367	.0446	14.2908	.0000	.5490	.7243

This result showed that with an increase in implementation of learning strategies by a unit, student academic performance increased by 0.637 units. The implication is that implementation of learning strategies has a significant influence on student academic performance. Substituting equation 3.1 with these results becomes equation 4.1 thus;

Performance=1.20+.637SI+.173..(4.1)

c (0.637)

Figure 4.4 Analytical Model (Total Effect)

4.14.2 Direct Effect

The effect of implementation of learning strategies on resource utilization was sought for the purpose of condition No.2. Table 4.20 indicates that the R^2=0.244, hence significant (p<0.000). 24.4% of resource utilization is predicted by implementation of learning strategies. From the model, the influence of implementation of learning strategies on resource utilization is significant (β = 0.798, t (292) = 9.7, p <.000) (Figure 4.5)

Table 4.20 Model Summary (Outcome: Resource Utilization)

R	R-sq	MSE	F	df1	df2	p
4940	.2440	.7567	94.2647	1.0000	292.0000	.0000

Model	coeff	se	t	p	LLCI	ULCI
constant	-.0983	.3199	-.3072	.7589	-.7279	.5313
StrIP	.7983	.0822	9.7090	.0000	.6365	.9602

From these findings a unit increase in implementation of learning strategies causes 0.798 units increase in resource utilization. Thus, implementation of learning strategies significantly contributes to the resource utilization among lecturers. Substituting equation 4.1 with the results becomes equation 4.2 thus;

Ruti=-0.0983+ .7983StrIp +.3199…... (4.2)

4.14.3 Indirect Effect

The indirect effect of resource utilization on performance of students and the influence of implementation of learning strategies on performance of students with control for resource utilization was determined. Results of the model [β = 0.235, t (291) = 8.2, p <.000]. This indicated that resource utilization controlling for implementation of learning strategies predict 52.2% of performance of students. Further, the analysis revealed that, the effect of implementation of learning strategies on student performance with control for resource utilization was also significant (β = 0.449, t (291) = 9.71, p = <.000) as indicated in Table 4.21.

Table 4.21 Indirect Effects Model Summary (Outcome: Performance)

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7226	.5222	.1810	159.0335	2.0000	291.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	1.2248	.1565	7.8280	.0000	.9169	1.5328
Ruti	.2350	.0286	8.2097	.0000	.1786	.2913
StrIP	.4491	.0463	9.7101	.0000	.3581	.5401

Though the indirect effect remained significant at 0.449, it reduced from 0.637 in model 1 (total effect).

Substituting equation 4.2 with the results becomes equation 4.3 thus;

$$Performance = 1.22 + .449SI + .235RU + .157 \text{ ....(4.3)}$$

The results showed that with mediator control (resource utilization), implementation of learning strategies was still significant in prediction of academic performance of students as shown [c' = 0.449, t (291)]. However, the significance dropped from 0.637, confirming that the mediation was partial. The analytical mediation framework is shown in Figure 4.5.
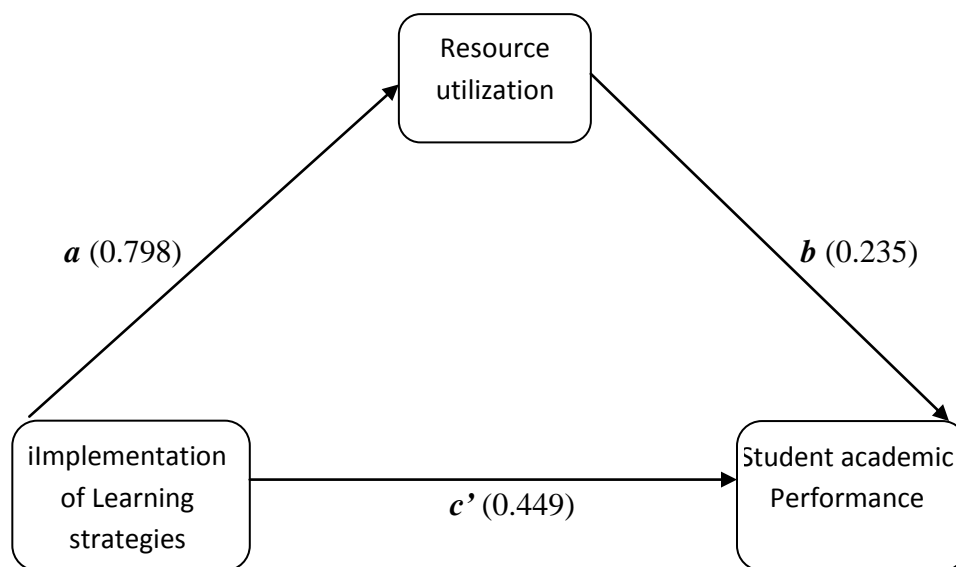
Figure 4.5 Analytical Model; Direct and indirect effect

Total effect – c =.637 total effect = direct effect + indirect effect which is c = c'+ab
.637= . 449+ (.798 x .235)

Direct effect – c' =.449 direct effect = indirect effect – total effect c'=ab-c
.449 =(.798 x.235) - .637

Indirect effect=$ab = c - c'$ indirect effect =total effect –direct effect
(0.798 x 0.235) = 0.188= c-c'= (0.637-0.449) =0.188

4.14.4 Confirming Mediation Effect

Vander Weele (2016) suggested a confirmation of the existence of an equity relationship among the parameters of the models above (Figure 4.5). The strength of the mediation was worked out from the Total effect as shown in Table 4.19. The mediating effect of

Resource utilization was obtained as a product of two indirect paths of performance (Per) denoted as *a* and *b* (Figure 4.5) which is equivalent to total effect minus direct effect. This confirms the figures given by regression output on figure 4.4. This figure also conforms with the regression figures given in Table 4.22.

Table 4.22 Total, Direct and Indirect Effects

Effect of X on Y	Total	Direct	Indirect (Ruti)
Effect	.6367	.4491	.1876
SE	.0446	.0463	.0244
T	14.2908	9.7101	
P	.0000	.0000	
LLCI	.5490	.3581	.1444
ULCI	.7243	.5401	.2424

The researcher utilized a bootstrap procedure in testing the significance of indirect effects in the mediated model. The bootstrap procedure gives a 95% confidence for indirect effect value *ab* in unstandardized coefficients terms. The results revealed a lower limit interval of .144 and upper limit interval of .242. Considering that the confidence interval at $p<0.05$ does not include zero, the null hypothesis **(HO$_5$)** that *ab* = 0 was not accepted.

4.14.5 Normal Theory Tests for Indirect Effect

A Sobel test is also given in the regression output showing partial mediation in the model [Z= 6.2497, p = .0001] Table 4.23. This implies that resource utilization is not the single dominant mediator; there may be other mediating variables through which implementation of learning strategies might influence performance. Thus, the hypothesis

(**H_O5**) stating that resource utilization does not mediate the association between implementation of learning strategies and performance of students is rejected.

Table 4.23 Normal Theory Tests for Indirect Effect

Effect	se	Z	P
.1876	.0300	6.2497	.0000

In Step 1 of the mediation model, the regression of implementation of learning strategies on student academic performance, ignoring the mediator, was significant, β = .637, t (292) = 14.30, p = .000. The model results showed R^2=0.412 and was significant (p<0.000) an indication that implementation of learning strategies predict 41.2% of student academic performance. The implementation of learning strategies predicts 41.2% of student academic performance. The model also showed that implementation of learning strategies predicts 24.4% of resource utilization.

Step 2 showed that the regression of implementation of learning strategies on the mediator, resource utilization, was also significant, β = .798, t (292) = 9.71, p = .000. Step 3 of the mediation process showed that the mediator (resource utilization), controlling for strategy implementation, was significant, β = .235, t(291) = 8.21, p = .000. In the mediation model, resource utilization controlling for implementation of learning strategies was significant having predicted 52.2% of student academic performance. Step 4 of the analyses revealed that, controlling for the mediator (resource utilization), implementation of learning strategies scores was a significant predictor of student academic performance, β = .4491, t (291) = 9.71, p =.000.

In this case, while the independent variable was a significant predictor for both the dependent and the mediator variables, it is no longer significant in the presence of the mediator variable; confirming the mediation effect. A measure for the indirect effect of X on Y was also presented after the regression models. In this case the effect size was .188, with a 95% confidence interval which did not include zero; that is to say the effect was significantly greater that zero at $\alpha = .05$. The confidence interval ranged between .144 and .242. Thus, the indirect effect of X on Y is significantly greater than zero. A Sobel test was conducted and found full mediation in the model ($z = 6.2497$, $p = .000$). It was found that resource utilization fully mediated the relationship between implementation of learning strategies and academic performance of students in Kenyan public universities.

CHAPTER FIVE

SUMMARY CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the researcher discusses the summary from findings, derives conclusions and makes recommendations. The aim of the study was determining the mediating role of resource utilization on the association between implementation of learning strategies and academic performance of students in Kenyan public universities.

5.2 Summary of the Study Findings

The findings are summarized based on the research findings. The study investigated the mediating role of resource utilization on the association between implementation of learning strategies and academic performance of students in Kenyan public universities.

5.2.2 Student-Centered Learning on Academic Performance of Students

From the study the first objective was to determine the effect of student-centered learning on the academic performance of students in Kenyan public universities. The findings indicated that there was a statistically significantly positive relationship between student-centered learning and academic performance of students in Kenyan public universities. On the descriptive analysis the student-centered variable gave the standard deviations in the range 0.73 to 1.18. Majority of the respondents agreed with the statement cooperation amongst students enhances student performance with the highest mean of (4.39). From the findings Student-centered learning had a Cronbach α of .768 and a KMO of .738 meaning that the data was reliable and adequate for factor ananlysis respectively.

In the regression analysis p value (p=.000) which is <.05 signifcance level hence the sample data is statistically significant and therefore rejects the null hypothesis (H01) that there is no effect of student-centred learning on the academic performance of students. The findings further indicated that there is an increase of .468 of student academic performance for every increase in student centred learning by a unit. Student-centred learning therefore has influence on the academic performance of students. This is in tandem with Lindquist (2015) who posits that when focus is directed towards the creation of spaces that allows students to act upon their interests, needs and intentions within a supportive structure, learning and overall performance is enhanced.

5.2.3 Social Support on Academic Performance of Students

The second objective of the study sought to determine the effect of social support on the academic performance of students in Kenyan public universities. Majority of the respondents agreed with the various aspects of social support and strongly agreed that guardian support is evident through raising fees for the students with the highest mean of (4.06). The standard deviations for social support ranged between 0.87 and 1.26. The findings indicated a significantly positive relationship between social support on the academic performance of students in Kenyan public universities. From the findings Social support had a Cronbach α of .834 and a KMO of .760 meaning that the data was reliable and adequate for factor ananlysis respectively. In the regression analysis the p value (p=.000) which is <.05 significance level hence the sample data is statistically significant and therefore rejects the null hypothesis (H01) that there is no effect of student-centred learning on the academic performance of students. The findings further indicated that there is an increase of .481 units of student academic performance for

every increase in Social support by a unit. Therefore, Social support strategy has influence on the academic performance of students. This is in line with Piper *et al*. (2018) who argued that social support functions as a protective element that prevents poor academic achievement and disengagement from school activities.

5.2.4 Technology Innovation on Academic Performance of Students

The third objective of the study sought to establish the effect of technology innovation on the academic performance of students in Kenyan public universities. Majority of the respondents agreed with the majority of the aspects of technology innovation and strongly agreed with the statement that computer-based programs aided students to adapt to changing technology with the highest mean of (4.24). The standard deviations range between 0.94 and 1.29. The findings therefore indicated a significantly positive relationship between technology innovation on the academic performance of students in Kenyan public universities. From the findings Technology Innovation had a Cronbach α of .856 and a KMO of .735 meaning that the data was reliable and adequate for factor ananlysis respectively. In the regression analysis the p value (p=.000) which is <.05 significance level hence the sample data is statistically significant and therefore rejects the null hypothesis (H01) that there is no effect of Technology innovation strategy on the academic performance of students. The findings further indicated that there is an increase of .358 units of student academic performance for every increase in Technology innovation by a unit. Therefore, Technology innovation strategy has influence on the academic performance of students. It thus indicates that technology innovation strategy has an impact on the performance of students. This is in agreement with Bigliard and Black et.al. who agreed that technological innovation is the successful implementation of

creative ideas in the organization according to Bigliardi (2013) given that a paradigm shift is being experienced in the world and higher education is not exempted from it (Black, *et al,* 2019).

5.2.5 Teacher-Centered Learning on Performance of Students

The fourth objective of the study sought to establish the effect of teacher centered learning on the academic performance of students in Kenyan public universities. Majority of the respondents agreed with the various aspects of teacher centred learning and strongly agreed with the statement that lecturers give assignments to students which enable them excel with a mean of (4.20). The standard deviations were in the range 0.76 to 1.16. The findings therefore indicated a significantly positive relationship between teacher centred learning on the academic performance of students in Kenyan public universities. This is in line with Zhao, Valcke, Desoete, Sang and Zhu, (2014) who revealed that teacher-centred teaching had a positive impact on students' performance. From the findings Teacher centred learning had a Cronbach α of .845 and a KMO of .755 meaning that the data was reliable and adequate for factor ananlysis respectively. In the regression analysis the p value (p=.000) which is <.05 significance level hence the sample data is statistically significant and therefore rejects the null hypothesis (H01) that there is no effect of Teeacher Centred learning strategy on the academic performance of students. The findings further indicated that there is an increase of .497 units of student academic performance for every increase in Teacher centred learning by a unit. Therefore, Teacher centred learning strategy has influence on the academic performance of students.   It thus indicates that teacher centered learning has an impact on the performance of students.

5.2.6 Resource Utilization on Performance of Students

The fifth objective of the study sought to determine the effect of resource utilization on the academic performance of students in Kenyan public universities. Majority of the respondents agreed with majority of aspects of resource utilization. From the findings it indicated a significantly positive relationship between resource utilization on the academic performance of students in Kenyan public universities. This finding revealed that, when the mediator was controlled (resource utilization), implementation of learning strategies was still a significant predictor of student performance even though a drop was experienced from, c =-0.637 to c' = 0.449 this confirms the presence of partial mediation.

Results of the Sobel test revealed partial mediation [Z= 6.25, p = .0001] as seen in Table 4.17, which implied that resource utilization is not the only mediator. Subsequently, other mediating factors exist which would influence the association between implementation of learning strategies and performance of students in public universities. Results from testing indirect effect significance revealed a lower limit confidence level of .144 and upper limit of .242. However, since zero is not included at p<0.05, the null hypothesis (**HO$_5$**) that *ab* = 0 was not accepted. Therefore, the null hypothesis (H05) is rejected that resource utilization does not mediate between implementation of learning strategies and performance of students. From the findings resource utilization had a Cronbach α of .907 and a KMO of .835 meaning that the data was reliable and adequate for factor ananlysis respectively. In the regression analysis the p value (p=.000) which is <.05 significance level hence the sample data is statistically significant and therefore rejects the null hypothesis (H01) that there is no effect of resource utilization on the academic performance of students. The findings further indicated that there is an increase of .372

units of student academic performance for every increase in resource utilization by a unit. Therefore, resource utilization has influence on the academic performance of students. This agrees with the findings of Udu (2018) that investment in resources is essential in ensuring institutions provides students with an environment to facilitate collaboration, learning from one another and benefitting from the environment overall, as well as maximizing learning to ensure that learners realize their full potential (Udu, 2018). It thus indicates the role that resource utilization mediates between implementation of learning strategies and academic performance of students.

5.3 Conclusions

From the findings it can be concluded that implementation of learning strategies plays a key role in influencing the academic performance of students. If proper strategies are implemented then there is possibility to improve academic performance of students. On student-centred learning findings showed that if students are given the opportunity to interact in form of discussing in class, self-direct themselves, it enables them also to acquire skills that would improve their performance. Social support has also proved to be very crucial in contribution to student performance since the findings indicated that lecturers give support to their students hence motivate them, peers give them the right direction, counsellors console them when they have a problem and guardians support them through payment of fees and emotional support and all these have shown a positive student performance.

On teacher-centered learning lecturers teach students hence they concentrate, give them assignments and do demonstrations in class whereby the students get to understand better and hence improve their performance. On technology innovation computer-based

programs have aided students to adapt to changing technology, online learning has given an opportunity to the busy and distance students and also it has developed student knowledge which has translated to student performance. Resource utilization is also a very important since they make an impact in performance of students. If the right learning strategies and policies have been put in place to avoid overloading of lecturers, feedback systems for students, adequate teaching and learning materials, correct class sizes all these promote or improve academic performance of the students.

5.4 Recommendations

From the findings it is evident that majority of the universities have adopted the teacher centred learning strategy which has greately improved students academic performance. There is need for the learning institutions to also consider using other strategies as well for instance student centred learning so that students become innovative, bring in new ideas and learn to be creative thinkers.

Identification of academic and social mentors within their learning environments would ensure that students are assisted both socially and academically so that they relieve the burden of stress within themselves and this influence academic performance of students. Utilizing students' feedback about their welfare, their learning environments and challenges they could be facing could help solve their social issues that affect their academic performance.

We are in a dynamic and busy environment where people have to handle so many issues at the same time hence there is need to urge learners to embrace technology innovations for instance video conferencing, e-masomo, e-learning since learning can be done

conveniently without necessarily moving from one point to another. Embracing technology innovation strategy would be a good move for most institutions in that there could be circumstances where students might not be in a position to attend physical classes and this would serve as an alternative for them. It would also produce all open minded and rounded graduates who are able to think further and act strategically in order to improve student performance as they will use platforms like google scholar to get a lot of information.

The traditional teacher centred learning form the findings appeared to influence a lot on student academic performance. There is need to try other strategies in order to comparte the results in as far as student academic performance is concerned. They could prove to be better if they are tried and results showed so that the best methods could be adopted.

The study recommends that institutions should utilize the available resources and consider investing a lot in learning resources in order to improve on the academic performance of students. Coming up with clear policies that give direction on which resources should be given priority over others in learning institutions is key in improving the academic performance of students.

Finally, the researcher recommends further researches to be done in order to establish other ways and means of improving performance of students in order to solve the current situation.

5.5 Areas for Further Research

There is need for higher institutions of learning such as universities to do more researches on how to further improve students' performance unders different circumstances for

instance during times of pandemic and serious economic crisis without compromising on quality. This is because any country's economic development depends on how knowledgeable their citizens are in order to be able to strategically think of ways and means to survive. There is need also to do research on the issue of how to attract and retain competent teaching staff who will be able to assist students to perform better.

There is need to do further researches on private universities and courses like engineering and medicine to establish ways of improving student academic performance.

There isneed for future scholars to conduct wide researches on how academic performance of student could be enhanced since it is becoming a challenging problem not only to the developing nations but also to the developed nations.

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APPENDICES

Appendix I: List of Public Universities in Kenya

Name of the Public University	Number of teaching staff
1. University of Nairobi	1636
2. Kenyatta University	981
3. Moi University	825
4. Jomo Kenyatta University of Science And Technology	740
5. Maseno university	373
6. Masinde Muliro university	322
7. Egerton University	545
8. Dedan Kimathi University of Technology	132
9. Chuka University	151
10. Technical University of Kenya	369
11. Technical university of Mombasa	158
12. Pwani University	151
13. Kisii University	190
14. University of Eldoret	275
15. Maasai Mara University	127
16. Jaramogi Oginga Odinga University of Science and Technology	193
17. Laikipia University	93
18. South Eastern Kenya University	120
19. Meru University of Science and Technology	92
20. Multimedia University of Kenya	100
21. University of Kabianga	144
22. Karatina University	137
23. Rongo University College	61
24. University of Embu	46
25. Cooperative University	44
26. Garissa Universty College	23
27. Machakos University College	56
28. Muranga University	52
29. Kibabii University	64
30. Kirinyaga University	57
31. Taita Taveta University	37
Total	8,295

Source: (Commission for University Education, CUE 2017)

Appendix II: **Sample Size of Selected Public Universities in Kenya**

University	Target population	Sample Size
Technical University of Kenya	369	32
Kenyatta University	981	86
Kisii University	190	17
Jomo Kenyatta University of Science and Technology	740	65
Maseno university	373	33
Maasai Mara University	127	11
Egerton University (EU)	545	48
Moi University (MU)	825	73
Jaramogi Oginga Odinga University of Science and Technology (JOOUST)	193	17
Total	4343	366

Source: Author, 2022

Appendix III: Authorization Letter

Dear Respondent,

I am a student at University of Eldoret pursuing a course leading to a Master of Business Management. I am carrying out a research on mediating role of resource utilization on the relationship between implementation of learning strategies and academic performance of students in Kenyan public universities.

The attached questionnaire has been designed to help gather data from respondents. With respect to this, you have been identified as one of the respondents.

Therefore, I kindly request you to facilitate the collection of the necessary data by answering the questions as precisely and factually as possible.

This information sought is purely for academic purposes and this I assure you of strict confidentiality of the information given.

Yours faithfully,

ANN CHERUS

Appendix IV: Questionnaires

Please tick appropriately and use the scales provided where necessary.

Section A: BACKGROUND INFORMATION

1. Indicate your age bracket.

   Between 21-30 [   ] Between 31-40 [   ]

   Between 41-50 [   ] Over 50 years   [   ]

2. Indicate your level of education.

   Diploma level   [   ] Degree level [   ]

   Masters level   [   ] Ph. D [   ]   Others   [   ]

3. Indicate the programmes you are lecturing.

   Diploma level   [   ] Degree level [   ]

   Masters level   [   ] Ph. D [   ]   Others   [   ]

4. Indicate how long you been lecturing at university level?

   Below 5 year [   ]   5-10 years [   ]   10-15 years [   ]

   15-20 years [   ]   above 20 years [   ]

SECTION B

Please tick appropriately in the Boxes provided

1. How would you rate the level of achievement of the following student-centered learning items towards student performance? (1= Strongly Disagree, 2=Disagree, 3=Undecided, 4= Agree, 5=Strongly Agree).

Student-Centered Learning Measures	1	2	3	4	5
There is group discussions to ensure effective students' performance					
Skills developed during training improves student performance					
Cooperation amongst students enhance student performance					
Students master concepts well during self-directed learning					
Attitude change towards learning improves student performance					
Students enjoy self-paced learning which improves their performance					
Experiential learning over time enhances student performance					

2. How would you rate the level of achievement of the following social support measures in student performance? (1= Strongly Disagree, 2=Disagree, 3=Undecided, 4= Agree, 5=Strongly Agree).

Social Support Measures	1	2	3	4	5
Guardian support is evident through raising fees for the students					
The Dean of students assists in the management of students' discipline					
Lecturers are involved in the guidance of students toward right direction					
Students rely on Counselors to help them relax when they are tensed					
The school management encourage students in their worst or weak points					
Students need counseling from peers for consolation when they are upset					
Counselors assist students to keep good company in order to perform					
Course lecturers provide full support to their students for motivation					

3. How would you rate the level of achievement of the following technology innovation measures towards student performance? (1= Strongly Disagree, 2=Disagree, 3=Undecided, 4= Agree, 5=Strongly Agree).

Technology Innovation Measures	1	2	3	4	5
More focus on technology improvement enhances job market potential					
Online learning has provided an opportunity for busy students to learn					
Computer based programs aid students to adapt to changing technology					
Video conferencing is used by distant learning students to learn					
Investment in technology opens a potential for student scaling					
Technology aims at knowledge development and student performance					

4. How would you rate the level of achievement of the following teacher-centered learning measures towards student performance? (1= Strongly Disagree, 2=Disagree, 3=Undecided, 4= Agree, 5=Strongly Agree).

Teacher-Centered Learning Measures	1	2	3	4	5
Lecturers tailor the curriculum toward student needs					
Curriculum content is demonstrated more practically than theoretical					
Lecturers teach courses geared toward the job market					
Lecturers teach students so that they concentrate and perform					
Lecturers give assignments to students which enable them excel					
Lecturers demonstrate in class to make students understand better					
Lecturers participate in class discussions as it makes students active					

5. How would you rate the effects of system utilization on student performance? (1= Strongly Disagree, 2=Disagree, 3=Undecided, 4= Agree, 5=Strongly Agree).

Effects of Resource Utilization	1	2	3	4	5
Institution has right resources that assist in enhancing student performance					
The institution has information systems like complimentary and suggestion boxes that students use to communicate					
The institution has automated student feedback mechanisms					
The institution has right software that manages students databases					
Institution has teaching materials that assist students to study					
The existing policies regulates teaching load of staff to avoid overloading					
Institution has adequate lecture halls that accommodate required capacity					
Institution admits the correct class size as per existing facilities					
Institution has adequate learning materials for students being taught					

6. How would you rate the level of achievement of the following performance items in your institution? (1= Strongly Disagree, 2=Disagree, 3=Undecided, 4= Agree, 5=Strongly Agree).

Student Performance Measures	1	2	3	4	5
There is high student achievement in our institution					
Student performance is a reflection of overall university objective					
There is high graduate rate at the end of our courses					
Ranking of our institution is among the top performing institution					
There is a positive public perception about our institution					
Majority of our students have high profile jobs in government sector					
Potential employers come to interview our students more often					

Appendix V: Matrix

Run MATRIX procedure:

```
**************** PROCESS Procedure for SPSS Release 2.13.2 **************

        Written by Andrew F. Hayes, Ph.D.        www.afhayes.com
    Documentation available in Hayes (2013). www.guilford.com/p/hayes3
***********************************************************************
Model = 4
    Y = Perf
    X = StrIP
    M = Ruti
Sample size
      294
***********************************************************************
Outcome: Ruti
Model Summary
         R         R-sq         MSE           F         df1         df2           p
     .4940        .2440        .7567      94.2647      1.0000     292.0000        .0000
Model
            coeff          se           t           p         LLCI        ULCI
constant   -.0983        .3199      -.3072        .7589       -.7279        .5313
StrIP       .7983        .0822      9.7090        .0000        .6365        .9602


Covariance matrix of regression parameter estimates
           constant       StrIP
constant     .1023       -.0260
StrIP       -.0260        .0068


***********************************************************************
Outcome: Perf
Model Summary
         R         R-sq         MSE           F         df1         df2           p
     .7226        .5222        .1810     159.0335      2.0000     291.0000        .0000

Model
            coeff          se           t           p         LLCI        ULCI
constant   1.2248        .1565      7.8280        .0000        .9169       1.5328
Ruti        .2350        .0286      8.2097        .0000        .1786        .2913
StrIP       .4491        .0463      9.7101        .0000        .3581        .5401


Covariance matrix of regression parameter estimates
           constant        Ruti        StrIP
constant     .0245        .0001       -.0063
Ruti         .0001        .0008       -.0007
StrIP       -.0063       -.0007        .0021
************************** TOTAL EFFECT MODEL **************************
Outcome: Perf
Model Summary
         R         R-sq         MSE           F         df1         df2           p
     .6415        .4116        .2221     204.2274      1.0000     292.0000        .0000
Model
            coeff          se           t           p         LLCI        ULCI
constant   1.2017        .1733      6.9336        .0000        .8606       1.5428
StrIP       .6367        .0446     14.2908        .0000        .5490        .7243
```

```
Covariance matrix of regression parameter estimates
           constant     StrIP
constant     .0300      -.0076
StrIP       -.0076       .0020


***************** TOTAL, DIRECT, AND INDIRECT EFFECTS ********************
Total effect of X on Y
      Effect        SE          t           p        LLCI        ULCI
       .6367      .0446    14.2908       .0000       .5490       .7243


Direct effect of X on Y
      Effect        SE          t           p        LLCI        ULCI
       .4491      .0463     9.7101       .0000       .3581       .5401


Indirect effect of X on Y
           Effect    Boot SE    BootLLCI    BootULCI
Ruti        .1876      .0244       .1444       .2424


Partially standardized indirect effect of X on Y
           Effect    Boot SE    BootLLCI    BootULCI
Ruti        .3058      .0453       .2320       .4206


Completely standardized indirect effect of X on Y
           Effect    Boot SE    BootLLCI    BootULCI
Ruti        .1890      .0255       .1439       .2469


Ratio of indirect to total effect of X on Y
           Effect    Boot SE    BootLLCI    BootULCI
Ruti        .2946      .0517       .2149       .4344


Ratio of indirect to direct effect of X on Y
           Effect    Boot SE    BootLLCI    BootULCI
Ruti        .4177      .1148       .2737       .7680


R-squared mediation effect size (R-sq_med)
           Effect    Boot SE    BootLLCI    BootULCI
Ruti        .2568      .0385       .1826       .3341


Preacher and Kelley (2011) Kappa-squared
           Effect    Boot SE    BootLLCI    BootULCI
Ruti        .2144      .0244       .1701       .2675



Normal theory tests for indirect effect
      Effect        se          Z           p
       .1876      .0300     6.2497       .0000
****************** ANALYSIS NOTES AND WARNINGS *************************
Number of bootstrap samples for bias corrected bootstrap confidence
intervals:
     1000
Level of confidence for all confidence intervals in output:
    95.00
------ END MATRIX ---
```
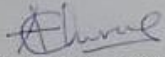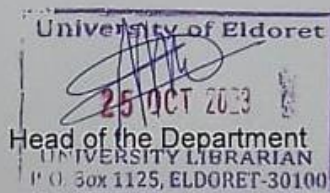
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