

**RELATIONSHIP BETWEEN UTILIZATION OF ONLINE ELECTRONIC
RESOURCES AND ACADEMIC PERFORMANCE OF UNDERGRADUATE
INFORMATION TECHNOLOGY STUDENTS OF JOMO KENYATTA
UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
CONFERMENT OF MASTER OF INFORMATION SCIENCE DEGREE
OF KENYA METHODIST UNIVERSITY**

OCTOBER, 2020

DECLARATION

Declaration by Student

This research thesis is my original work and has not been presented for a degree or any other award in any other University.

Sign... 

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Recommendation by the Supervisors

We confirm that the work reported in this thesis was carried out by the candidate under our supervision.

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DEDICATION

I wish to dedicate this thesis to my beloved wife Risper and our sons Havilah and baby

Hebron.

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First, I wish thank the Almighty God for His grace that has enabled me come this far. Secondly, I wish to acknowledge the counsel, encouragement and guidance of my supervisors Dr. Paul Gichohi (PhD) and Dr. Grace Irura (PhD) whose selfless support enabled me to develop the research idea and complete this MA thesis. My gratitude to my course mates MIS 2017 class, for their encouragement and moral support throughout the period of this thesis. In addition, I would like to thank the director of JKUAT Eldoret campus for allowing me to conduct this research in their institution. To my family: thank you for inspiring me to complete this work. Last but not least, I would like to appreciate all the respondents that participated in this study. To everyone mentioned here, and those who might not been mentioned: may the Almighty God bless you.

ABSTRACT

The ability to search for and get e-resources information by a student does not only improve their academic performance, but it also fosters life-long learning. For a university student to achieve academic success, they have to be equipped with technical know-how, especially on utilization of e-resources. Despite this mechanism and preparation done by university libraries, there is dismal performance in semester examinations among students. This study aimed at investigating the relationship between utilization of online electronic resources and academic performance of undergraduate Information Technology students of Jomo Kenyatta University of Agriculture and Technology- Eldoret Campus. The purpose of the study was to measure the influence of e-books, e-resources, online past examination papers and institutional repository on academic performance. Expectation Confirmation Theory was adopted to guide our investigation. Descriptive survey research design was used in the study. Respondents were the undergraduate students in the department of Information Technology, and librarians in Jomo Kenyatta University of Agriculture and Technology-Eldoret Campus. A sample of 105 students and 2 librarians were considered. Data was collected using closed-ended questionnaires from students while interview guide was used on librarians. Students were sampled using stratified sampling while, Head of library and library staff in charge of e-resources in Eldoret campus were purposively included in the study. To ensure validity and reliability, pre-testing of research instruments was done on 20 undergraduate Information Technology students of Mount Kenya university-Eldoret campus. SPSS was used in analysing data using descriptive statistics such as mean, percentage, frequencies and standard deviation. Univariate and multiple regression analysis were used to test the hypothesis and overall model respectively. After undergraduate students were trained on e-resources the variance within groups was smaller than the variance between groups, hence, there was a higher likelihood that the difference observed in academic performance was higher in second semester as compared to the first semester. Further, the study established that there is a positive and significant relationship between e-books, e-journals, online past examination papers and academic performance. The study also indicated a negative relationship between online institutional repository and academic performance. It was concluded that there was a relationship between utilization of online electronic resources and academic performance of undergraduate Information Technology students of Jomo Kenyatta University of Agriculture and Technology- Eldoret Campus. The overall model in multiple regression analysis indicated that when electronic resources were combined, online past examinations papers significantly affected academic performance. The study recommended that more policies should be developed to able students to access diverse online past examinations papers, not only from JKUAT library, but also government examination bodies such as Kenya National Examination Council (KNEC). Further, the study recommended that JKUAT provides more e-journal articles and e-books for the students to access since they significantly determine their academic performance. Additionally, JKUAT should ensure that students are able to easily access the e-resources through the library website whenever they wish.

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ABBREVIATIONS AND ACRONYMS

CD-ROM	Compact disk- read only memory
EPB	Electronic publication
IT	Information technology
KeMU	Kenya Methodist University
MOBI	Mobi pocket
NACOSTI	National Commission for Science, Technology & Innovation
OPAC	Online public access catalogue
PDF	Portable document format
KOHA	Integrated library management system

CHAPTER ONE

INTRODUCTION

This chapter puts into context the study problem. It presents the background of the study, the purpose of the study, the objectives, research hypothesis, and its significance. The scope, limitations and assumptions of the study are also highlighted, and an operational definition of the key terms used in the study provided.

1.1 Background of the study

The progression of information, connection and computing technologies has revolutionized various industries and sectors of the economy due to its ability to increase efficiency and effectiveness in work processes. Education is among the beneficiaries of e-resources and IT advancements where learning technologies have been integrated in training and education to enhance service delivery. Notably, electronic information resources are widely used by other non-academic parties such as non-governmental organizations, public servants, and inventors for diverse reasons.

The ability to access e-resources information by a student does not only improve their academic performance, but it has also become crucial in the contemporary world. For a university student to achieve the current envied position of utmost success academically, they have to equip themselves with technical know-how of digital niche especially in the utilization of e-resources. The study therefore, was aimed at investigating the relationship between utilization of online electronic resources and academic performance of undergraduate information technology students of Jomo Kenyatta University of Agriculture and Technology.

1.1.1 Concept of academic performance in universities

Generally, academic performance is defined as attainment of either short or long-term objectives by a university, lecturer or a student. The topic on academic performance, especially factors that affect student's performance in the university or higher-level learning institutions, has fascinated many scholars. Academic performance is normally graded using a system of collective grade point average (GPA) for the marking period in most institutions (Srinivas & Venkatkrishnan, 2016).

Quantification of performance is vital process in any organization. It is through this process that parties with various interests in organizations such as a university make decisions on which department would receive various inputs like grants offered to students and how that would facilitate having more distinguishing results (Hennessy & Lynch, 2017). For example, the government is usually keen on releasing various research grants to university students with outstanding research record (Teferra, 2015). That means a university whose students are high performers are at a better position to attract more revenue from diverse sources as compared to universities' whose students are not high performers (Ayub, 2018).

Performance is usually quantified through examinations such as end of semester exams and continuous assessment tests. However, there are arguments on what really is the best way to test a significant technical acquaintance like skills, or declarative acquaintance like facts. While in advanced states such as California, the performance of institutes is quantified through the academic performance index, in developing countries like Zambia, students' performance is based on grades. In Pakistan, academic performance is based on student development performance (Ayub, 2018). The academic performance of students is

influenced by the availability and utilization of the learning resources including online electronic resources. The universities deliver superior services to learners. They have the obligation of producing graduates capable of solving societal difficulties, (Daramola, 2016). Academic performance in a university is hence measured by end of semester exams, continuous assessment tests, assignments, group discussion grades, quality of research and course completion rates (Ayub, 2018; Teferra, 2015). This is because the aforementioned measurement apparatuses are the most commonly used when measuring if there are any improvements on academic performances (Ayub, 2018; Teferra, 2015).

Learners doing various degrees in a university require information to satisfy their communal and mental wants so as to encourage and improve their academic pursuit throughout their progression of learning (Quadri & Quadri, 2015). A university library has a mandate of ensuring that there are enough and updated information resources in soft-copy and hard-copies. Hardcopy resources are items like books, magazines, newspapers and printed journals. Soft copy items include items like e-resources, databases and library repository. Hard and soft copy resources provide support to learners to be able to accomplish their course work and research processes.

1.1.2 Utilization of e-resources by university students

An electronic resource (e-resource) is a constituent entailing information or database programmed for analysis and operation through utilization of the exterior device linked to the computer by internet (Alshahrani et al., 2017). Therefore, e-resources are softcopy documents that are in e-format and which are gotten through internet (Alshahrani et al., 2017). They were obtainable in diverse arrangements such as softcopy books, digital collections, e-journal, e-publication, online learning instructors, online past exam papers,

online institutional repositories (IR), online dialogue, online newscast, information records and electronic mails. Diverse scholars in different nations and fields relies heavily on e-resources (Nicholas et al., 2017).

In regard to utilization of online resources, whereas a lot of individuals, even in developed countries like China, Australia and Germany, require help to get information from databases, there are some who comfortably access such information. Literature reveals that technology is crucial to the transformation of people in regard to utilization of online resources through the use of computers and internet. Access to e-resources necessitates a specific proficiency in computers which enables the individual to examine and sieve information, or basically come up with acceptable directions on what manner of operations to perform (Lan, 2018). Studies show that the learning and research qualities of undergraduate students are mainly reliant on availability, amount and relevance of online resources referred to (Radhika, 2019). This discussion on the utilization of e-resources in modern information settings has captivated scholars in emerging states. Studies conducted in West Africa, particularly in Nigeria by (Ogedebe, 2012) notes that undergraduates extensively utilizes online resources and the cyberspace for research exertion, hence, gradually upgrading their academic performance.

There is scanty research on utilization of e-resources in the north eastern part of Nigeria. Indeed, limited studies had been conducted to demonstrate the execution of ICT in relation to universities in different regions in Nigeria. This is because scientific expansion in universities in the area is less developed. In Uganda, according to Mbarara University of Science and Technology (MUST) Library Annual Report (2008), truncated utilization of e-resources was mentioned as a potential factor for low academic performance among

university students. Nevertheless, Cerretani et al. (2016) observes that much of literature chiefly revolves around the effect of e-resources on academic performance and the general information tenacities. The findings pinpointed that studies that related to student's perception and involvement in e-resources were at their infancy stages (Adekunmisi et al., 2013).

It is meaningful to remark that many of these scientific studies are simply on learners in all nations apart from northern global nations (Nwagwu et al., 2009). As is the case with all other Kenyan higher learning institutions, JKUAT undergraduate students are frequently required to do varied studies to provide solutions in their immediate environments. However, JKUAT Academic report (2018) shows that JKUAT undergraduate students are supposed to utilize online resources to attain their academic tasks, not only in learning but also in research. Thus, there is need to analyze the association between utilization of online resources and academic performance of undergraduates' IT students of JKUAT.

E-resources are crucial to availing information to consumers in distant regions who might want to broaden their knowledge (Shanmugam, 2011). The presence of dispersal of various users over versatile areas of e-resources demands that university libraries make numerous subscriptions to e-resources such as e-books, e-journals and library repository to satisfy this demand (Kibirge & DePalo, 2000). Indeed, there are numerous e-resources in internet such as e-books, e-past papers, online institutional repositories as well as other resources which are readily available for users (Lynch & Hennessy, 2017). The obtainability of information in e-format eases indexing and probing, hence, enhancing the relevance of this study in exploiting updated information resources. When an instructor is satisfied with the content of various e-resources, they transfer the same to the students and users under them,

thereby motivating them to follow the same path, hence, enhancing their respective computer knowledge.

Although the youthful age group is labelled the digital age, there is compelling evidence that their interest in scientific modernizations particularly in academics is relatively wanting (Mawere & Sai, 2018). Therefore, the present study is relevant to both the scholars and the administration of universities in promoting friendly solutions to challenges of low utilization of e-resources as it places interest on the challenges in access of e-resources as a major ground for low academic performance in JKUAT (Togia & Tsigilis, 2009). Electronic resources are helpful resources for learning, knowledge and research. The growing demand for exploitation of the cyberspace has eased the formation and application of e-resources (Mosha, & Bea, 2014).

1.1.3 Student performance and utilization of e-resources

The quick expansion in the utilization of the web encourages the creation and utilization of electronic resources. The traditional teaching whereby a lecturer was the main wellspring of information is rapidly getting out of date since data keeps on relocating to the computer cloud (Abubakar & Adetimirin, 2016). In modern times, students have significantly been enabled to learn more as well as study at their own pace by getting access to e-resources. Such electronic resources as e-journals and online databases, have an edge over the conventional print-based media as they were well on the way to contain data and offer propelled search capacities. Additionally, IT knowledge enhances adaptability and empowers access of data without time and area limitations.

Although students in institutions of higher learning lack access to important information, they are left to battle on their own in comprehending various subjects before taking the

mandatory test (Alshahrani et al., 2017). The accessibility of data in electronic configuration which encourages simpler ordering and looking through disentangles students' lives in getting to pertinent information. One significant part of advanced education is research and as such advanced education creates and ingrained examination aptitudes so as to deliver qualified people, with a lasting quest for information vital for personal and professional development (Callicott, et al., 2015). In addition, it is normal that a teacher who agrees to utilization of electronic resources may support their students to do likewise, thereby adding to their computer and data proficiency (Daramola, 2016). For students in the IT division, the capacity to viably use electronic data resources is a key issue since it helps with upgrading the nature of their work when they become professionals.

1.1.4 Jomo Kenyatta university library

Jomo Kenyatta University library has subscribed to thousands of online resources such as e-books and e-journals and facilitates access and utilization of these resources by the JKUAT undergraduate students. JKUT library conducted a thorough department specific e-resources training for all students during the second trimester 2019. The training was conducted in collaboration with the chair of each academic department. However, there were propositions that the students do not utilize the online resources appropriately and hence low academic performance. According to Commission for University Education (CUE, 2019), a campus, which is the smallest part of a parent university, ought to have satisfactory resources to sustain various course requirements. That means that no matter how small a campus is, availability of resources is a mandatory requirement.

JKUAT library has a collection of 130,000 books, both in softcopy and hardcopy formats in its various campuses. There has been a push to shift to digital library where there is over

238,000 e-resources; of which 75,000 comprise e-journals and 163,000 are e-books. Both the students and staff have access to e-resources through online repository at the convenience of their location globally. In addition, JKUT library has subscribed to Ez-proxy, a software that enables users to access e-resources while inside and outside the university premises. This software, authenticates users of e-resources where one is required to log in using students' registration numbers. One is able to know IT students who have logged in by checking the registration numbers. Nevertheless, there is low utilization of online electronic resources by the students, and hence dismal performance in semester exams.

JKUAT library has simplified the process whereby one has to physically appear in the library to register as a member. The library user is required to fill in the e-registration form and submit it to the library online. JKUAT library uses an integrated library management system called (KOHA). This software ensures that all services of the library are updated and incase a subscription is almost expired, there is always a notification meant to promote best services by avoiding abrupt suspension. JKUAT University has several campuses across Kenya. Eldoret campus is one of its constituent campuses. JKUAT Eldoret campus was established in the year 2014, with an enrollment of 135 students pursuing courses in the departments of business, and pure and applied science (Jomo Kenyatta University of Agriculture and Technology [JKUAT], 2020).

1.2 Statement of the problem

Universities in Kenya have policies and systems that ensure students are taught properly and have access to information resources to support teaching, learning and research. In addition, the guidelines from Commission for University Education (CUE) of 2014 require University Libraries to provide quality and adequate information sources. These standards have also outlined measures for ensuring robust technological infrastructure for supporting the provision of online resources. CUE further requires a University Library to establish institutional repository. Kenya Library and Information Services Consortium (KLISC) facilitates access to e-resources in University Libraries in Kenya. The university students are therefore expected to utilize these online information resources in order to excel in their academic pursuits, as well as acquire knowledge and competencies required in the job market (Mushtaq & Khan, 2012).

Despite these mechanisms, systems and investment in online resources, there is dismal performance in semester examinations among students (Okello-Obura & Magara, 2008). Mbarara University of Science and Technology (MUST) Library Annual Report (2016) showed that low exploitation of information resources is a potential factor for low academic performance among university students. This is because; students are pursuing other interests in the internet rather than utilizing online resources gainfully, for example, to enhance their performance in examinations. Jones et al. (2011) reveals that proper utilization of existing research on learning resources helps improve students' accomplishments and academic performance (Jones et al., 2011). However, in 2018, a report from JKUAT showed that high number of students made requests for deferment of their semester examinations as others preferred to sit for special examinations due to

unpreparedness. The problem was attributed to many factors; poor utilization of online resources being one of them.

If this problem goes unaddressed, the University will lose a lot of money in purchasing online resources which would be underutilized by students, while poor academic performance would continue to be noted. Tapfuma and Hoskins (2019) linked low student's performances to the utilization of library information resources. Norhidayah et al. (2009) also reported how library resources positively affected the student's performance. Other past studies done in developed nations such as (Appleton, 2006; Berzins & Hudson, 2011; Deng, 2010; Rogers et al., 2011) gave challenges that can only be applicable in developed nations. Adeniran (2013), Chitanana et al. (2008), Legris, Inghamb and Colletterec (2003), Mittal and Bala (2013), Mosha and Bea (2014) and Okello-Obura (2010) show that use of e-resources includes aspects of cost of usage, web network difficulties, deficiency of innovative gadgets, such as PCs; absence of prepared work force, absence of nearby online databases and constrained transfer speed.

In Kenya, limited past studies have specifically investigated whether utilization of e-resources such as electronic books, electronic journals, online past papers and electronic repository resources have an influence on academic performance of undergraduate university students at Jomo Kenyatta University of Agriculture and Technology-Eldoret campus. This created a gap to which this study aims at addressing.

1.3 Purpose of the study

The purpose of this study was to find out the relationship between utilization of online electronic resources and academic performance of undergraduate Information Technology students of Jomo Kenyatta University of agriculture and technology, Eldoret campus.

1.4 Specific objectives

- i. To assess the influence of utilization of e-books on academic performance of IT students at Jomo Kenyatta university of Agriculture and Technology.
- ii. To examine the influence of utilization of e-journals on academic performance of IT students at Jomo Kenyatta university of Agriculture and Technology.
- iii. To determine the influence of utilization of online past examination papers on academic performance of IT students at Jomo Kenyatta university of Agriculture and Technology.
- iv. To measure the influence of utilization of online institutional repository on academic performance of IT students at Jomo Kenyatta university of Agriculture and Technology.

1.5 Research hypothesis

The study was guided by the following hypotheses:

H₀1: The utilization of e-books had no relationship with academic performance of the Information Technology undergraduate students of Jomo Kenyatta University.

H₀2: The utilization of e-journals had no relationship with academic performance of Information Technology undergraduate students of Jomo Kenyatta University.

H₀3: The utilization of online past examination papers had no relationship with academic performance of the Information Technology undergraduate students of Jomo Kenyatta University.

H₀4: The utilization of institutional repository had no relationship with academic performance of Information Technology undergraduate students of Jomo Kenyatta University.

1.6 Significance of the study

The findings of this study are important to the university administration as regards acquisition and utilization of online resources by students, lecturers and public servants. The research aimed at improving the lowly academic performance of students suggested by low exploitation of e-resources in JKUAT. The study will also add to the literature on the correlation between utilization of online resources and academic performance of university students. Indeed, the findings of the study informs the university teaching on areas of focus in advancing the academic performance of undergraduate students in Kenyan universities.

Further, the findings will be instrumental in resource allocation by the university management as well as the government, which is a major stakeholder in university education. The study will promote proper utilization of resources which have been wasted when undergraduate students underutilize subscribed online resources. In addition, the study will benefit employers in all sectors by enhancing quality education and training, hence, producing effective workers with high intellectual output.

The policy formulators will find this study useful as it will gave foundational knowledge on why there need to have more policies related to application of electronic resources in Kenya.

1.7 Scope of Study

This study focused on the relationship between utilization of online electronic resources and the academic performance of Information Technology undergraduate students of

JKUAT. The data for analysis in the study was collected from IT undergraduate students of Jomo Kenyatta University of Agriculture and Technology, Eldoret campus library, situated along Oginga Odinga Street, on the 6th floor of Sirgoi Holdings building. However, accessibility of online electronic resources that predispose students to difficulties in utilization of online electronic resources was beyond the scope of this study.

1.8 Limitations of the study

The study anticipated respondents' inability to give comprehensive facts in so far as factors affecting utilization of online resources and dismal academic performance of undergraduate students. However, the limitation was minimized by the researcher by explaining the core issues through random check phone calls before they started filling the questionnaires for those respondents who might not have understood some issues.

This study had a methodological limitation considering that, quasi-experimental would have sufficed more by administering pre-test and post-test with training on e-resources being the intervention. However, this study largely relied on information provided by staff regarding the e-resources training and the utilization records kept by the librarian who was in charge of e-resources.

1.9 Assumptions of the study

This study assumed that:

- i. All JKUAT IT undergraduate students, as well as other respondents who use JKUAT library were aware of the online information resources accessible to JKUAT library users.
- ii. The students had already received results of the first and second semester of 2019.
- iii. The students were sincere in providing their actual GPA for the first and second semesters in 2019.
- iv. Assumed that e-resources librarians were keeping records of students trained and downloads done by students for each department
- v. The training on information retrieval skills conducted by library staff were effective and that all IT students had attended such trainings.
- vi. The total downloads reported by e-librarian depicted utilization of particular e-resources.

1.10 Operational Definition of Terms

Academic Library

This refers to an institutional unit that individuals such as students acquire knowledge through numerous informational resources that are managed by the librarians (Abubakar & Adetimirin, 2016).

Academic performance

Academic performance is the result of level through which academic arena participants attains their intended educational objectives.

Digital Library

Digital library refers to a collection of books, journals, past papers and other learning resources accessible to users through a connection (Adekunmisi et al., 2013)

Electronic Resources

An electronic resource is a constituent entailing information or database programmed for analysis and operation through utilization of the exterior device linked to the computer by internet (Alshahrani et al., 2017).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covers literature related to utilization of online electronic resources and academic performance. It also presents the theoretical framework against which the study is molded, as well as the conceptual framework that guided the study. The studies reviewed relate to the variables of this study, namely; academic performance of undergraduate students, utilization of e-books, utilization of e-journals; utilization of online past papers, and utilization of online institutional repository.

2.2 Academic performance of undergraduate students

Academic performance is key to an organization's realization of pleasing results prompted by enhanced excellence in assigned tasks (Neumann, 2019). According to Tadesse et al. (2018) academic performance is not dependent on how old someone is, where they live or their sex. However, a student living near a university performed better than those who do not (Tadesse et al., 2018). Shankland and Rosset (2017) observes that when low performers are mixed with high performers, the students improve their results. This was because, if students have a desire to improve their results, nothing can stop them (Shankland & Rosset, 2017). Tadesse et al. (2018) notes that there is need for students to look for a way to enhance their study habits since weak study habits led to lower grades. Further, Harris and Hall (2017) argue that when the general academic performance is poor, the larger economy of a state is negatively affected.

In Japan, studies on factors that determine academic performance of undergraduate students reveal that access to e-resources has empowered scientists and financial analysts (Hojo, 2012). Considering that disparities in scholarly accomplishments of undergraduate students can in future bring pay imbalances, financial experts have incredible interest in

the determinants of undergraduate students' academic performance. Instruction creation capacities were evaluated utilizing undergraduate level accomplishment information for Japanese undergraduate students with accentuation on assessing the impact of capacity gathering. Sothan (2018) notes that that undergraduate students' grades are influenced by family foundations. However, school resources variable had a more effect (Sothan, 2018). Despite what is expected, the impacts of family foundations are reduced when students are assembled by their capacity. As a result, Hojo (2012) observes that there is a likelihood that schools can succeed if they diminish holes in circumstances among students from various family foundations

Al-Rofo (2010) studies undergraduate students' academic performance at Gurukul Kangri College in India. He uses GPA as a typical pointer of the performance of the students. Vermunt and Donche (2017) notes that legitimate direction is important in assisting the undergraduate students with issues like absence of relationship between ability and accomplishment; broken investigation practice, and defective techniques for learning.

Thayamathy et al. (2018) demonstrated that presentation a student's work depended on a couple of factors like, learning workplaces, age and sexual direction contrasts. The most basic factor with the positive outcome on the introduction of the students was the capacity of understudies being used as online resources. Robert and Sampson (2011) investigated university students who sufficiently participated in the learning methodology to check whether they had a higher consolidated assessment point. They found out that the students who were viably busy with the learning technique had a positive academic performance index. Li and Qiu (2018) found that educational activities of students, perspective on their modifying frameworks, and establishment attributes, such as, family pay, heading from

guardian, number of negative conditions in the house and guardian's level of education, were related to their compound scores.

Raychaudhuri et al. (2010) observes that various examinations have been set to see those elements which influence educational execution of undergraduate studies. Singh et al. (2016) found out that scholarly performance of students also relied upon elements such as their collaboration in the class, family pay, proximity to qualified instructors in school, and sex. A couple of studies have also conducted on the impact of companion sway on college undergraduates' insightful execution. For example, Filade (2019) explores whether buddy sway has more convincing effects than family. He observes that partner help is associated with the undergraduate's ordinary assessment point (Filade, 2019). In addition, various models have been developed to evaluate the student's performance by taking various elements like family pay, heading from watchmen, the instructor students' extent, partition of school and sex. However, the studies did not investigate on utilization of online resources. (Sothan, 2018).

Studies on emerging African economies reveal that the issue of poor academic performance amongst students is of much concern. In developing nations, the issue of poor academic performance is blamed on the fallen standard of training (Alami, 2016). Government's interest in advanced education and its implications to student's accomplishment is important. Economical change and development are impractical without advanced education framework.

With regard to advanced education, one notable pointer of success is the scholarly accomplishment evaluation of a student. Al-Rofo (2010) observes that GPA is a typical marker of the students' academic presentation . As indicated by Oviogbodu (2015) real

heading is essential in helping the students with issues like nonattendance, and the relationship between factors such as capacity and achievement; faulty examination practice; and imperfect strategies for learning. Nkechi et al. (2016) demonstrated that the performance of students depends on learning workplaces, age, sexual direction differences and utilization of online resources.

Yeshimebrat et al. (2013) explores factors influencing female students' academic accomplishment at Bahir Dar College, Ethiopia. They investigated 600 second year undergraduate female students and found out that academic accomplishment of female students was influenced by close-to-home related factors, such as strain, being dependent on drinking, smoking, proximity to disco houses, among others. College related factors, namely; impact of male students, absence of appropriate direction, absence of legitimate perusing place for students, and influence of male instructors came to the fore.

Locally, the investigation of scholastic performance uncovered that many respondents accessed e-resources via office computers connected to the library site (Rogers et al., 2011). In addition, a significant number of the respondents were ignorant and did not utilize on-line theory/expositions, abstracts/files, OPAC, on-line databases, which are extremely relevant to their examinations and research. Bashorun (2011) observes that utilization of electronic resources by students of the College of Ilorin was low. A study by Bashorun (2011) did not establish a connection between the low use of e-resources and scholarly performance of college students. In this way, this study fills this by analyzing the utilization of e-resources and establishing how these resources improve the academic performance of the undergraduate college students. Indeed, there is no literature on the relationship between e-resources and academic performance at JKUAT.

From the studies investigated under this theme, it is evident that learners doing various degrees in a university require information to satisfy their communal and mental wants so as to encourage and improve their academic pursuit throughout their progression of learning (Quadri & Quadri, 2015). In addition, it has been established that students in institutions of higher learning lack access to important information, they are left to battle on their own in comprehending various subjects before taking the mandatory test (Alshahrani et al., 2017). The accessibility of data in electronic configuration which encourages simpler ordering and looking through disentangles students' lives in getting to pertinent information. One significant part of advanced education is research and as such advanced education creates and ingrained examination aptitudes so as to deliver qualified people, with a lasting quest for information vital for personal and professional development (Callicott, et al., 2015).

2.3 Utilization of e-books and academic performance

Electronic books are materials comprising of information on personal computer (PC) program encoded for perusal and control by the PC users through utilization of the fringe gadgets legitimately connected to the PC, through the web (Okiki & Asiru, 2011). This classification incorporated programming applications, electronic writings and bibliographic databases. Online Word reference for Library and Data Science (2019) characterizes a digital book as an advanced rendition of a customary print book intended to be perused on a PC or digital book peruser. Numerous digital books share common attributes with the printed reading material, alongside all figures and outlines. Digital books normally have a list of chapters that one snapped to explore explicit parts or areas.

There are numerous types of e-books, namely; electronic publication (EPUB), Mobipocket (MOBI), AZW3, I-book (IBA) and Portable Document Format (PDF) (Frankland & Ray, 2017; Rotich & Munge, 2013). Electronic publication (EPUB) is an e-book on compatible software that enables a reader to read it in their phones, tablets and computers (Frankland & Ray, 2017). Mobipocket (MOBI) is an extension file that is used to stock digital books and are premeditated precisely for mobile devices with low bandwidth (Berzins & Hudson, 2011). AZW3 e-book is a digital rights management protected kindle format with formatted book text and chapter markers just like mobi-pocket (Appleton et al., 2006). The only difference between Mobi-pocket and AZW3 is that AZW3 is protected. That is, there is a limitation to who can access the e-book in you mobile, tablet of computers. I-book (IBA) is a type of e-book that is supported in video, sound, images, and interactive elements (Rogers et al., 2011). Portable Document Format (PDF) is a type of e-book that has caught all the components of a printed report as an electronic picture that you can see, explore, print, or forward to another person (Croteau, 2015). The indicators of e-books in a university library are the number of retrievals, retrieval intervals, quantity of e-books in the catalogues, and subscription rates. (Walter, 2013).

The verifiable path of digital books started in the mid-1960s, with the presentation of machine coherent list which filled in as an order apparatus to data resources. This followed the utilization of OPAC and bibliographic databases, which were enhanced to the utilization of data on Disc ROM databases in 1980s (Ganaie & Rather, 2015).

Various researchers, for example (Al-Harbi, 2010; Alkharang & Ghinea, 2013; Al-Marabeh & Mohammad, 2013) highlighted the advantages of e-learning to instructors and students. The advantages consist of on-demand availability, discoverability, self-pacing,

interactivity, an increased accessibility to information, content standardization, accountability, confidence and increased convenience, interactive, better content delivery and personalized instruction. E-books are also preferred by students because they allow multi-access, which means that one copy can be utilized simultaneously by thousands of users from various locations over the internet.

The job of scholastic libraries is developing with the reception of new advances in data executives and administration conveyance, to make data promptly accessible and available to clients (Ferguson, 2017). Therefore, the use of the web in enlightening has enabled basic access to various resources including computerized books, and hence, information sharing has basically extended (Croteau, 2015). Furthermore, Frankland and Ray (2017) proclaim that the power of this sharing has brought additional favorable circumstances. They are used in any region, and at whatever point in spite of the way the viability of this advancement is surveyed with use of degree of the perfect results in undergraduate achievement. From now on, much examination was driven after some an ideal opportunity to understand the reasons behind this situation. For example, in the America, the consortia advocate for growth in centralized funding for provision of electronic books and library technology through statewide networks increased the power of these organizations in provision of services to both publicly and privately-funded libraries (Umar, 2018).

Likewise, more data on digital books and full-content databases was presented in 1990s (Ganaie & Rather, 2015). Ganaie and Rather (2015) found out that digital books permitted clients who had web access to be looking and recovering data from any area. Subsequently, clients were presented with amounts of digital books which were savvier and encouraged accessibility of data which was neither open nor known. A lot of inquiries about on the

utilization of digital books have been conducted in created nations (Adams & Bonk, 1995; Berzins & Hudson, 2011; Deng, 2010; Rogers et al., 2011). Emerging states have substantial difficulties such as incorporated expense of performance, web network difficulties, deficiency of mechanical gadgets, for example, PCs, absence of prepared staff, absence of nearby online databases and constrained transfer speed (Mittal & Bala, 2013). However, these difficulties do not have any significant bearing on different nations, hence, justifying and making this examination pertinent.

Institutions of higher learning in emerging states have made significant progress in empowering students to access electronic books so as to enhance their scholarly endeavors. Indeed, in Zimbabwe, institutions like Extraordinary Zimbabwe College (GZU) and Midlands State College have managed to ease access to e-resources in spite of the challenges involved. Buarki and Ahmad (2019) notes that with the development in ubiquity of electronic books, the customary jobs of libraries were bit by bit moving from print books to digital books, and giving access to data was viewed as more significant than claiming it. In Kenya, JKUAT library annual report (2018) shows that JKUAT, like all other universities in Kenya, have subscribed to electronic books databases and electronic databases which provide more data with boundless access in 21st century. These e-resources are important in the academic pursuits of university students. However, the extent to which they affected academic performance of undergraduate students had not been investigated.

Various researchers reviewed under e-books, for example (Al-Harbi, 2010; Al-kharang & Ghinea, 2013; Al-Marabeh & Mohammad, 2013) highlighted the advantages of e-learning to instructors and students. The advantages consist of on-demand availability,

discoverability, self-pacing, interactivity, an increased accessibility to information, content standardization, accountability, confidence and increased convenience, interactive, better content delivery and personalized instruction. However, nations have had substantial difficulties such as incorporated expense of performance, web network difficulties, deficiency of mechanical gadgets, for example, PCs, absence of prepared staff, absence of nearby online databases and constrained transfer speed

2.4 Utilization of e-journals and academic performance

Online journal is a periodical publication offered in electronic medium via the Web (Hinds & Bernhardt 2013). Electronic journals are preferred to the printed journals. It is easy to look through the substance pages as well as the full content of e-journals to discover articles on a specific subject. In addition, e-journals are easier to read articles in students' work places, share with colleagues or even download for printing. The article that a student needs to peruse is easily accessible when put online. In the event that the Library is shut, hypertext permit the library user to move to various segments inside articles and interface one to related resources on the web. They incorporate more pictures and diverse media material. E-journals can be regarded as intelligent since the reader is able to email the creator or editorial manager with their remarks on the quality of the electronic journals. There are different types of e-journals, namely; scholarly e-journals, general public journals and industry e-journals (Lan, 2018). Scholarly e-journals are published journals that are academic in nature and meant to add knowledge in the academic field of interest (Tlakula & Fombad, 2017). General public journals are journals that are written on a general topic that affect people from diverse backgrounds or schools of thought (Tlakula & Fombad, 2017). Industry e-journals are published works of different cooperates on introduction of a

new policy or product fields such as medicine, finance, engineering, education and tourism amongst other fields (Tlakula & Fombad, 2017). The indicators of an e-journal are the number of retrievals, retrieval intervals, number of e-journals in the catalogues and subscription rates (Tlakula & Fombad, 2017).

E-Journals have become a significant section of the College libraries designed to fulfil the library's objective of educating, teaching and research. Whitmire (2001) observes that the utilization of e-resources including e-journals is impacted by student's utilization of the library. The more a student utilizes the library, the more comfortable they become with its e-journals. In advanced states, e-journals have pulled in substantially enthusiasm in the scholarly world in recent years. For instance, Sun et al. (2006) studied the utilization of e-journals through the sites of Huazhong College of Science and Innovation in China. The findings indicated that e-resources were offered and that the working condition of the library website was redone as per clients' socioeconomics. The study recommended that clients be supported with all tools so as to upgrade their data while utilizing electronic diaries. Additionally, Min (2010) reports on various client studies that have been attempted at Tsinghua College in Beijing, China. The study notes that clients' desire for the library are rising. Many studies about e-journals need examination of the variables that have relate to the use of e-resources and academic performance. Indeed, students obtain information from e-journals and other learning resources, open repository resources and business e-learning items which provide more learning openings.

In Africa, several studies have been conducted in academic institutions on issues relating to electronic journals and collection development practices. However, fewer studies focus on utilization of e-resources and academic performance of university students. For

instance, Oyedapo and Ojo (2013) did a study at Obafemi Awolowo College in Nigeria on the utilization of electronic journals. They noted that electronic resources were underutilized. The reason for this under-usage of electronic diaries was poor looking-through abilities (Oyedapo & Ojo, 2013). Baro et al. (2011) investigated the mindfulness and utilization of online data resources including journals by clinical students at Delta State College in Nigeria and found that academic electronic journals databases were under-used. Shonola et al. (2016) studied on two Colleges in South-West Nigeria and found out that the students utilized their compact gadgets to trade educational related messages and academic records with cohorts, search the web and library databases for scholarly materials, practice online tests and have conversations with schoolmates. Students in Igbinedion College, Nigeria admitted that they utilized cell phones to look for academic materials and insightful articles for assignments. Additionally, they indicated that utilizing the web on their cell phones empowered them to look and access scholastic data right away. Poushter (2016) observes that structural improvement in colleges was not advantageous compared to usage of data and correspondence innovation which had been embraced in many colleges in Nigeria.

A recent study done in Tanzania by Katalabwa (2016) indicated that electronic journals are significant and valuable resources that help learning and research in higher learning institutions. The study suggested that most postgraduate students in Tanzania use electronic journals because they are relevant and very useful for coursework and research. The findings of hi study indicated that electronic journals were up to date; some were freely available and easily accessible anywhere within the University compound; and that users downloaded, printed and store them. Okello-Obura and Magara (2008) analyzed electronic

information access and utilization at the East African School of Library and Information Science, Makerere School, Uganda. The study pointed out that customers appreciated information given in electronic diaries. They noted absence of current resources as a major concern that they had. Okello and Magara (2008) notes the challenge of underutilization and observe that the difficulties of access and use of electronic diaries by Makerere undergraduates in Uganda just like students in other institutions of higher learning was to a great extent credited to absence of mindfulness about the resources.

Undergraduate students use electronic journals for different purposes. Kumar and Kumar (2008) observe that the purpose of accessing electronic journals is to support learning and to write project work. Ansari and Zuberi (2010) observes that many students use e-resources for research. In addition, other students use them to complete assignments, prepare for examinations and to gain subject knowledge (Ansari & Zuberi, 2010). Crothan (2011) confirms that graduate students use Google Researcher more since they think that it is simple to learn and easier to explore. In addition, students noted that the structure and interface of web crawlers was easy to understand and it was a helpful resource for their examination. Emereole and Ogugua (2007) in their study of library utilization discovered that there was low support of library benefits particularly in the territory of utilization of electronic journals as a low number of clients did not completely understand the chances of the library in this data age.

On the opposite view, Manjack et al. (2019) investigated accessibility and usage of e-journals. The study uncovered that electronic resources like the web, email, online databases, electronic databases and electronic journals were exceptionally utilized by the respondents in two colleges, while other electronic resources like CD- ROM databases, e-

journals, OPAC and electronic books were infrequently utilized. The study uncovered that the college students utilized the electronic diaries for different reasons, namely; sourcing materials for venture composing, finishing assignments, and for other individual reasons.

Locally, there are various e-resources activities accessible to Kenyans. Some are free while others are offered at a cost undertaken by financiers. A portion of the activities that Kenyans have the option of using throughout the year included HINARI, OARE, AJOL, Medline and PERI. Notably, giver supported ventures require the contributor to quit financing and in this way the consortium is a significant model for supportability of such resources. PERI resources are important and lead to the development of sustainable networks for information resource sharing among Kenyan universities (Rotich & Munge, 2013).

This study addresses the gap that existed on relationship between utilization of online resources and academic performance of undergraduate students. Despite efforts by JKUAT library, it had been noted that students did not appreciate utilization of electronic resources, yet they had tremendous impact on their academic performance. However, the study found out that there was need for them to get more skills in the utilization of electronic resources.

From the reviewed studies, it is clear that e-resources are crucial to availing information to consumers in distant regions who might want to broaden their knowledge (Shanmugam, 2011). The presence of dispersal of various users over versatile areas of e-resources demands that university libraries make numerous subscriptions to e-resources such as e-books, e-journals and library repository to satisfy this demand (Kibirge & DePalo, 2000). Few studies have directed focused on utilization of e-resources and academic performance

of university students. For instance, Oyedapo and Ojo (2013) did a study at Obafemi Awolowo College in Nigeria on the utilization of electronic journals. They noted that electronic resources were underutilized. The reason for this under-usage of electronic diaries was poor looking-through abilities (Oyedapo & Ojo, 2013). Baro et al. (2011) investigated the mindfulness and utilization of online data resources including journals by clinical students at Delta State College in Nigeria and found that academic electronic journals databases were under-used.

2.5 Utilization of online past examination papers and academic performance

Online past examination papers are past examination question papers which have been digitized in a read only electronic format and then uploaded into a system. They are therefore accessed through the university website for broad access through searching by either the title or code of the paper. Once it is retrieved and displayed on the screen, it is also read online or downloaded for later use when offline. The features for online past examination papers are that once accessed through online platform from one's convenient location, the same paper provide multi-use by several patrons at a given time; hence, very appropriate to students. E-past papers are utilized by both students and lecturers in preparation for semester examinations. There are different types of online past examination papers, namely; school-based e-papers, essay e-papers, problem-based e-papers, audio e-papers and multiple-choice e-papers (Lan, 2018). School-based e-papers are all the examinations that have ever been done specifically in the university (Daramola, 2016). Essay e-papers are writings done on various subjects which have been written by students before (Abubakar & Adetimirin, 2016). Problem-based e-papers are any kind of step-based writing on how to derive a solution; for example, students performing an experiment in a

lab (Abubakar & Adetimirin, 2016). Audio e-papers are examinations that are recorded in an oral version (Daramola, 2016). Multiple choice e-papers are examinations that have options in answers given (Daramola, 2016). The indicators of an online past examination papers in a university library are the number of retrievals, retrieval intervals, number of e-journals in the catalogues and subscription rates (Tlakula & Fombad, 2017).

Development in ICT is changing individuals' disposition towards the reception of progressively current data resources to meet their data needs. College libraries need to have solid assortment advancement of e-past assessment papers in print and non-print type to meet information necessities of both neighborhood and remote clients of libraries (Olofinsawe & Oyeniya, 2010). The scholarly library has an obligation to guarantee sufficient e-past assessment papers to help college students complete their course work. This would encourage students to utilize the online library resources.

Shukla and Mishra (2011) found out that exploration researchers preferred utilization of e-past assessment papers to print papers and that e-papers were frequently utilized. These findings were attested to by Okiki and Asiru (2011) who saw that college students use e-past assessment papers on 'month to month' and 'periodic' basis. Thus, the selection pace of e-past assessment papers was apparently growing because of the degree of mindfulness by users and the undergraduate students. College libraries give limited time exercises to improve access and utilization of e-past assessment papers so as to expand the utilization of online resources. The time component allowed users to pick data from numerous sources to fulfill their data needs. Majid and Tan (2002) noted that students consider print resources in the library more valuable for their examination needs than electronic resources.

The findings of Majid & Tan (2002) contradicted Kumbar and Lohar (2005) who observed that majority of undergraduate students with exceptional academic performance use online resources. Notably, when users have the skill and information on specific data resources, their entrance to such data resources increases. As such, the library should enhance mindfulness so that the students can improve their utilization of the library resources and administrations. However, fewer studies provide motivations for irregularity as regards support of e-resources by users. This explains the development all in all data arrangements by libraries.

The reviewed studies show that the issue of data expansion poses diverse challenges to students, scientists and data users since they have to filter through large amounts of data to decide quality data from the internet. Users of e-resources in institutions of higher education need to have data from solid, dependable and thoroughly evaluated sources so as to empower them to lead quality research. Thus, scholarly libraries transfer sufficient past assessment papers; and buy in electronic databases and journals to furnish users with authentic boundless data (Spalding & Wang, 2006).

2.6 Utilization of online institutional repository and academic performance

Online institutional repository can be defined as "a group of amenities that a university offers to its students and lecturers for the administration and dissemination of insightful materials made by the foundation and its locale individuals (Ukwoma & Dicke, 2017). In a university, this incorporates materials, such as, monographs, e-prints of scholarly articles that are going through peer audit. An institutional repository incorporates other advanced resources created by scholars, namely; datasets, regulatory archives, course notes, reports, learning items, or meeting procedures (Ukwoma & Dicke, 2017). Store of materials in an

institutional repository is regularly ordered by that foundation (Callicott et al., 2015). Repositories included advanced libraries, computerized repository, metadata, open access journals and open access archives.

A repository permits universities to gather, oversee, and feature the entirety of their personnel yield and information inside a solitary repository (Callicott et al., 2015). To meet this necessity, it needs to help diverse advantage types over a full scope of scholarly trainings. The repository is not restricted to distributions yet it incorporates pre-prints, informational indexes, varying media, innovative works, PC codes, blog entries, and different kinds of materials. A perfect institutional archive gives universities a simple method to interface investigate yield with the informational indexes, introductions, blog entries, press inclusion, online life notices, grants, and different materials related to this yield (Callicott et al., 2015). That way, any individual who was perusing a faculty examination paper approaches the paper itself. However, a wide scope of data assists repository with comprehension and utilizes this more successfully. Users have the option to explore effectively starting with one related resource, progressively onto the next. An institutional archive applies to the reasonable information standards so as to make information findable, open, interpretable, and reusable by different specialists and organizations (Ukwoma & Dicke, 2017). Repository incorporates university's current work processes and innovation frameworks through application programming interfaces (APIs) and notable gauges.

An institutional repository utilizes computerized procedures to capture data and makes it simpler to store research resources at every possible opportunity, hence, lessening the work associated with stationary libraries (Callicott et al., 2015). For example, repository has the

option of distinguishing journal articles distributed by staff, and the metadata related with these articles, and adds this exploration to the archive naturally at every possible opportunity. An institutional repository utilizes progress examination to give learners more prominent knowledge into their exploration. Executive managers, senior members of staff, office staff, and other workers have the option of gathering experiences beyond what number of papers their workforce had distributed in scholastic diaries, and how regularly these papers had been cited. Consequently, access to information is a significant resource in personal improvement.

Competence in utilization of e-resources is achieved when users of the library procure data and information about the presence of e-resources while using institutional repository for the library. At the point when users of a library are presented with data resources accessible in a specific library, they already have a possibility of getting to them and are urged to use them prudently to fulfill their data needs (Amayah, 2013). Knowledge of using institutional repository in libraries is an issue of concern. However, accessibility is not an assurance utilization. In this manner, ideal use of institutional archives by users relied upon the consciousness of the resources. A study by Chirra and Madhusudhan (2009) indicated that 100% of doctoral research researchers knew about the online resources and accessed them. Institutional repository empowered access to online e-resources including propositions and expositions which are cited by students and analysts. By some coincidence, these researchers are early adopters of e-journals and other electronic library assets. For example, e-postulation are increasingly agreeable in getting to these data resources for students' scholarly undertakings.

There are different methods by which a client consideration is attributed to the utilization of online assets of libraries. An investigation by Soyizwapi (2005) uncovered that postgraduate students became mindful of online institutional repository from an assortment of sources, namely; companions, library direction projects and scholastic staff. Different methods for mindfulness creation are through banners, flyers, leaflet, library manage, library site, shows, radio projects and through verbal exchange by talks or educators who guide undergraduates to data destinations. Despite this innovation, libraries are expected to re-plan their special exercises by embracing mechanical patterns to elevate their administrations to cover both nearby and remote clients. Libraries would generally fail if they are not involved in overseeing data, but simply fail to answer client questions. In the present data period, libraries are increasingly proactive with the intention of giving their undergraduate clients compelling and proficient resources and administrations which improve their academic performance upon access.

In this way, libraries that do not receive appropriate components to get their resources and administrations to clients are probably going to deny them the benefits of online institutional vault (Okello-Obura & Magara, 2010). Indeed, the support of a library's online resources has improved after they have been introduced to potential clients. Tragically, scholarly libraries accomplish this order because of restricted spending plans, swelling and the expanding cost of electronic data resources. Egberongbe (2011) observes that e-resources, such as, bibliographic databases, e-papers and e-magazines are not well utilized. Notably, absence of attention to such online resources, kept clients from acknowledging the possibilities of meeting their data needs. There is a lot to be finished by data experts or administrators to guarantee better utilization of e-resources by library clients. Other than

the customary methods for mindfulness creation, libraries are required to receive increasingly mechanical intuitive intends to advance their administrations.

Various studies have been done on client familiarity with online resources in Ghana. Badu and Markwei (2005) found that both the scholarly staff and postgraduate students knew about online institutional repository and their administrations yet academic staff utilized online institutional repository more than the postgraduate students. In addition, college students did not know more about institutional repository than their postgraduate counterparts. Their study noted that appropriation of online institutional archive did not occur at the same time in the social framework. As such, some clients received or utilized the advancement before others.

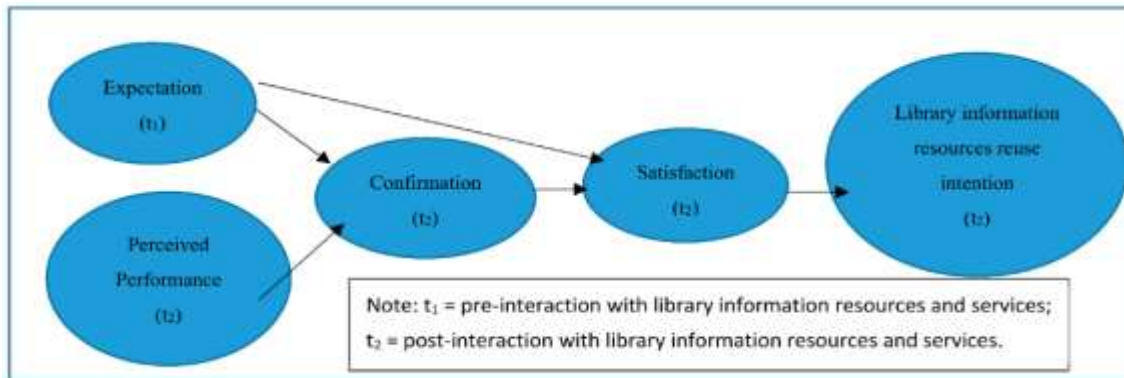
2.7 Theoretical Framework

This study was molded according to the principles of Expectation Confirmation Theory (ECT) propounded by Bhattacharjee in the year 2001. The theory was motivated by showcasing field and it was broadly utilized in purchaser conduct writing to examine shopper fulfillment, post-buy conduct and administration advertising. This theory comprises of five builds, namely; desire, execution, affirmation, and fulfillment and repurchase goal. It proposes that desires, expected results bring about post-buy fulfillment. Expected results are intermediated through positive or negative affirmation of desires by execution. When an item or administration meets desire (positive affirmation), post-buy delight will take structure. If an item/administration fails to meet desires (negative affirmation), purchasers' disappointment is likely to occur. In this study, university students' desire indicated what their possibilities were about the library and library data

resources. A library client shaped biased discernment about library data resources before utilization as appeared in Figure 2.1.

Figure 2.1

Model on expectation confirmation theory



As indicated by ECT, observations dependent on the presentation of an item were legitimately partial by pre-use desires, and therefore straightforwardly sway affirmation or any case of assessments and post-use fulfillment of library data resources. The pertinence implies that in the wake of utilizing a specific online data resources for a while, the clients structure an origination of saw helpfulness. Secondly, the clients decided to what degree their impression of handiness about that data resources have been affirmed. In the event that the client found that the item/administration was as helpful as he/she saw, he/she shapes a thought of fulfillment. At that point the fulfilled clients meet to proceed with the utilization of data resources, while the disappointed clients are expected to stop the administration.

After communication with library data resources, affirmation or any biased recognition was shown up. These appraisals or ends are shown in contrast with the client's underlying desires. At the point when a help or item beat the client's biased desires, the affirmation is

certain. This is altogether estimated to expand post-use fulfillment of library data resources. At the point when the results are not the same as the client's underlying desires, the affirmation was negative, which is attributed to diminished post-use or post-reception fulfillment of library data resources. The model predicts that the customers' conduct is utilized in sending important advertising systems dependent on the shopper fulfillment status. This theory was used also by Sothan (2018) who saw that connection between the autonomous variable (use of e-resources) and ward variable (scholarly execution) existed since fulfilled clients kept utilizing the online resources and subsequently improve their scholastic execution of the undergraduate students.

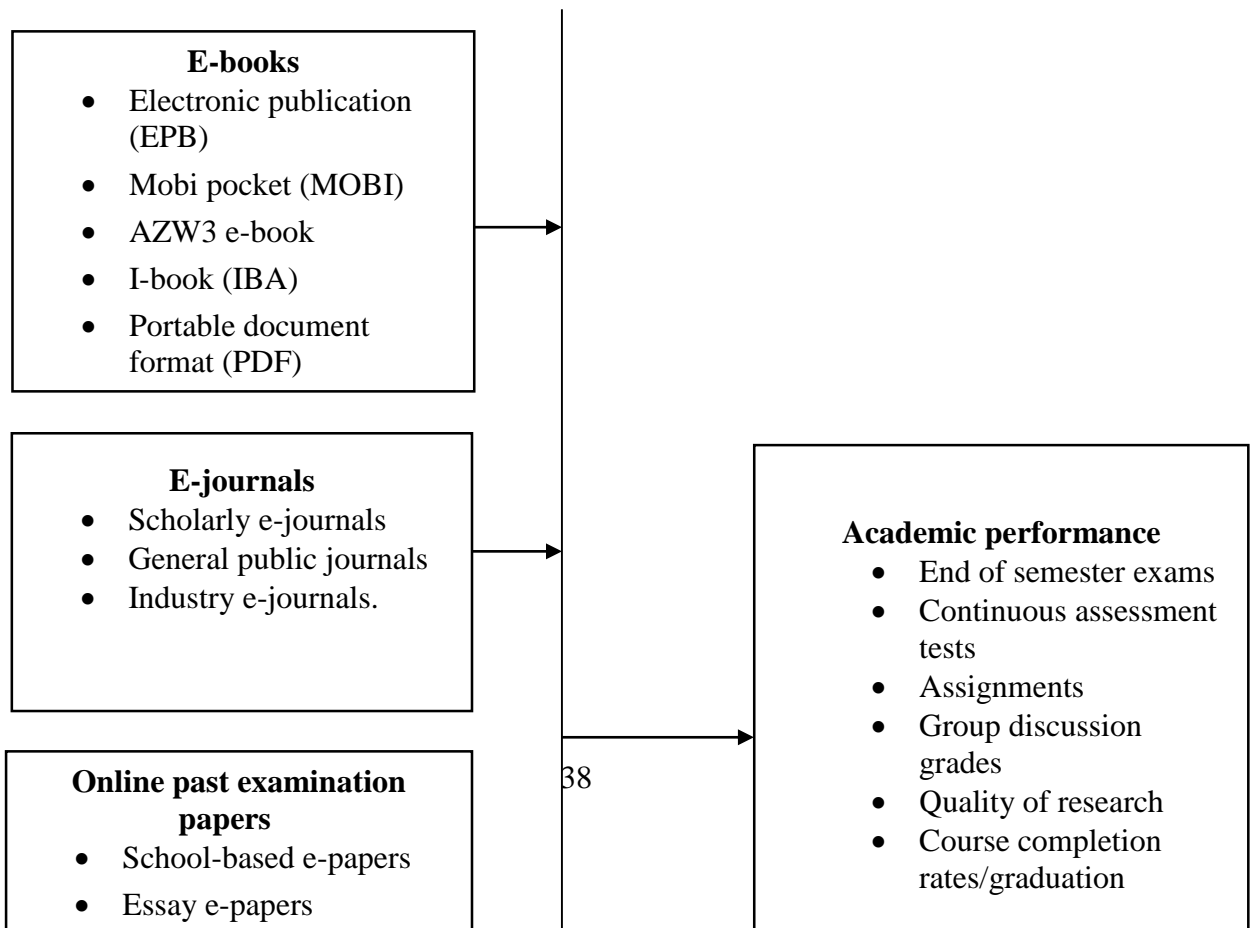
2.8 Conceptual Framework

Conceptual framework is the speculated model highlighting the ideas in the examination including the connections of the factors. The conceptual framework includes independent variable, namely; usage of online resources, dependent variables and outcome variables, namely; academic performance of undergraduate students. It helps to envision the connection between key ideas and factors that are applicable to this examination, as indicated in Figure 2.2.

2.8.1 Operational framework

Figure 2.2

Conceptual framework





Online institutional repository

- Administrative documents
- Course notes
- Reports
- Conference proceedings
- E-thesis and dissertations



The conceptual framework is formulated to depict the connections of various variables in the study. These variables will be explained further using an operational framework. Utilization of online electronic resources including e-books, online journals, online past examination papers and online repository are depicted here as independent variables. E-books are measured in electronic publication (EPB), mobi pocket (MOBI), AZW3 e-book, I-book (IBA) and portable document format (PDF) (Rotich & Munge, 2013). E-journals are measured by scholarly e-journals, general public journals and industry e-journals (Tlakula & Fombad, 2017). Online past examination papers are measured by school-based e-papers, essay e-papers, problem-based e-papers, audio e-papers and multiple-choice e-papers (Lan, 2018).

Online institutional repository are measured by administrative documents, course notes, academic reports, conference proceedings and e-thesis and dissertations (Ukwoma & Dicke, 2017). Academic performance is the dependent variable which is measured using end of semester exams, continuous assessment tests, assignments, group discussion grades, quality of research and course completion rates or graduation (Ayub, 2018; Teferra, 2015; Tlakula & Fombad, 2017).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives an outline of strategy adopted in bid to achieve the research objectives. It describes the study area, the target population, research design and the sample size, research instruments, pre-testing of instruments, validity of research instruments, reliability of research instruments, and data analysis procedures. The ethical considerations are also given.

3.2 Research design

Saunders et al. (2009) defines a research design as arrangement of the collection conditions and data investigation strategies. This study adopted descriptive survey research design to investigate the relationship between utilization of online resources and academic performance of IT undergraduate students of JKUAT, Eldoret campus. Descriptive survey research design allowed study of relationships between independent and dependent variables. The descriptive survey research design was adopted in this study because it helped the researcher explain why, what and how the dismal academic performance of undergraduate students in semester examination was despite the utilization of online resources.

3.3 Location of the study

The research was carried out in Jomo Kenyatta University of Agriculture & Technology - Eldoret campus library situated in Central Business District of Eldoret town Uasin Gishu

County, Kenya. Eldoret town is termed as the regional business hub that connected Kenya, Uganda and Tanzania's investors (Kenya Investment Authority [KIA], 2016). It is considered a manufacturing and business center characterized by several multinational firms such as Toyota Company and Safaricom. Eldoret town, therefore, has an increasing requirement for skilled and qualified workforce who are supposed to be trained in various higher learning institutions (Ministry of education- Kenya, 2012).

Higher institutions of learning have been encouraged to cultivate research skills amongst the students so that they can replicate these skills and benefit their societies. The universities available in Eldoret town are Moi University, Catholic University of East Africa, Jomo Kenyatta University, University of Nairobi, University of East Africa - Baraton and Kisii Universities. JKUAT is historically recognized in Kenya for training IT professionals. The JKUAT Eldoret campus is one of the fastest growing satellite campuses of JKUAT, with a population of 2278 students and trimester enrollment of over 50 students in most courses (JKUAT, 2018). Eldoret campus has two departments, namely; Business Department and Pure and Applied Sciences Department. The latter is further sub-divided into Health Sciences, Information Technology (IT), and Pure and Applied Sciences.

JKUAT offers full-time, part-time and distance learning study modes. According to JKUAT (2018), students mainly depend on the campus library to do their assignments, revise for their examinations and access books and other resources that help them to do assignments. The library is well stocked, and has subscribed to online e-resources. It also has a vibrant digital repository that is accessed remotely. JKUAT library was chosen as an ideal study location due to its centrality in handling the rapidly growing student population, hence, necessitating frequent use of the library. In addition, the increasing thrill for e-

learning was occasioned by COVID-19. There was need to assess whether by utilizing e-resources, students from JKUAT, which is the leading university in technological innovation in Kenya, improved in their academic performance.

3.4 Target population

Population can be defined as collection of people, occasions or items having normal noticeable attributes (Saunders et al., 2009). In this study, the population comprised 526 undergraduate students in IT department and 2 library staff members (JKUAT report, 2018). The list of students was obtained from library management system (KOHA) by generating their email addresses together with their phone contacts. Questionnaires were sent to the respondents in Google forms via emails, and follow up was done on phone. The report from JKUAT (2018) showed that there is frequent usage of online library services by undergraduate students from the department of IT. The population of undergraduate students in the department of IT was larger compared to all other departments considering number of students enrolled for IT per semester. In addition, despite this enrollment in IT, the literature reviewed in chapter two showed that no study had been carried out in the department of IT to find out the relationship between utilization of online resources and academic performance.

The library staff were considered in this study because they were instrumental in shedding light on the availability of online resources in the JKUAT Eldoret campus library. Head of the library and the librarian in-charge of e-resources were considered in this study because they are key in providing information on the levels of utilization of various online electronic resources in the library (Katalabwa, 2016).

3.5 Sample size and sampling technique

Sampling is the methodology a researcher uses to assemble individuals, spots or things to be investigated. It is a procedure of choosing various people or articles from a population with the aim of choosing a bunch containing components of the attributes found in the whole gathering (Scheel et al., 2018).

3.5.1 Sample size

A sample is a limited piece of measurable population whose properties can be concentrated to pick up data about the entirety. According to Mugenda and Mugenda (2003) a sample of between 10-30 percent could be used to signify the whole population. This study used a sample size of 20% of 526 IT undergraduate student's population. This gave the study a sample size of 105.

3.5.2 Sampling technique

In this study the department of IT was purposively selected because of its relatively high enrollment of undergraduate students registered as library users at Eldoret campus. Simple random sampling was used to select the student's respondents who would fill in questionnaires that were inform of online Google forms due to covid-19 pandemic. Students were sampled using stratified sampling technique where they were grouped according to their year of study. First, second, third and fourth-year students all had an equal chance to participate in the study to avoid bias and enhance credible results. Systematic random sampling method was used to select students at each of the four strata to ensure everyone had an equivalent possibility of being chosen. The study obtained the 5th of every student from the 526 number of IT students to obtain 105. Purposive sampling technique was used in interviewing, via online zoom meeting due to COVID-19 pandemic,

the head of the library and the library staff in-charge of e-resources. These two interviewees gave information on the actual usage of e-resources by undergraduate students and how that was affecting their academic performance.

Table 3.1

Sampled Population

Students	Population	Sample size	Percentage
First year	163	33	31
Second year	154	31	30
Third year	125	25	23
Fourth year	84	16	21
Total	526	105	100

3.6 Data collection methods

The study used both questionnaire and telephone interview to collect data from undergraduate students and library staff respectively.

3.6.1 Questionnaire

The main instrument for collecting information from students was the questionnaire. Questionnaires were administered to undergraduate students in the department of IT. The questionnaires were divided into five areas, namely; the primary segment aimed at assembling the demographic data of the respondents; and the second area that addressed different subjects gotten from objectives of the study. The questionnaire comprised of

closed-ended questions. Closed-ended questionnaire gave the respondents a set of choices or options that used 5-point ordinal Likert scale to rate the statements. The 5-point Likert ordinal scale they answered was ticked either 1-Strongly disagree, 2-disagree, 3- Neither agree nor disagree, 4- Agree, 5- Strongly agree. The questionnaires were crafted based on the gaps identified in previous studies reviewed in chapter two (See appendix iii). Chirra and Madhusudhan (2009) used questionnaires in their studies.

3.6.2 Telephone interviews

Information from librarians was collected by use of interviews. The study chose this method since it yielded a very high response rate, detailed information and gave chance to seek clarification in case of a vague answer. Librarians were interviewed on utilization information of e-books, e-journals, online past examination papers and online institutional repository by students. The interviews were conducted through telephone interview platform due to covid-19 pandemic. Such interviews were suitable for librarians because librarians were well knowledgeable on how these variables worked in an academic library. The interview schedule was divided into 5 parts. Part one asked questions related to demographic information of the library staff. Part 2-5 addressed various variables of the study. The questions asked were derived from various gaps reviewed in previous studies in chapter two. See Appendix IV of this study provides the interview schedule that was used in this study.

3.7 Pre-testing of research instruments

In this study, the pre-testing of instruments was conducted in order to survey the validity and reliability of the research instruments. In the pre-testing, the researcher was able to

familiarize and assess issues that affected the data collection process, such as flow of questions, level of difficulties, and interpretation of questions. To ensure the questionnaires were tested freely, a pretest was done. Due to covid-19 pandemic, the researcher utilized online Google forms for the student's respondents while online zoom meeting was used to interview the head of library and the librarian in charge of e-resources.

Pre-testing was done at Mt. Kenya University, Eldoret Campus situated in Eldoret town. This university was selected because it was an accredited university and had a huge department of Information Technology (IT) department in its Eldoret campus just like JKUAT in Eldoret. The population for the pretest were identified using simple random sampling. A total number of 20 undergraduate students in IT Department were randomly selected and called using the telephone contacts obtained from the head-librarian in Eldoret campus of Mount Kenya University. Interview schedules were pre-tested through telephone calls to only the head of library and the librarian in charge of e-resources who were selected through purposive sampling method. Results of pre-test showed the need for refinement, modification and revision of the questions. The researcher was able to reformat the questions in the research instrument; and also remove redundancies from the questions so as to ensure easy understanding, organization and smooth flow of the study.

3.7.2 Reliability

Reliability is the consistency of estimation after some time that give comparable results on repeated trials (Scheel et al., 2018). To acquire this, a pre-test was directed and information gathered was utilized to compute reliability. Test on reliability was done by various techniques such as parallel forms reliability, internal consistency reliability and Cronbach's

alpha coefficient (Scheel et al., 2018). In this study, Cronbach's alpha coefficient was used in assessing the reliability of the research instruments. According to Kothari and Garg (2014), a reliable research instrument has a Cronbach's alpha coefficient range of above 0.7.

3.7.3 Validity

Validity of a research instrument is the level of exactness and weightiness of induction dependent on the investigation results (Saunders et al., 2016). Validity is the degree to which results obtained from the analysis of data represent the phenomenon under investigation. The validity of an exploration venture relied upon the kind of research instrument chosen.

The researcher considered validity measures like face validity, criterion validity and content validity. Face validity was ensured when the effect of e-books, e-journals, online past examination papers and online institutional repository on academic performance was known. That was, the effect of e-book on academic performance; the effect of e-journals on academic performance; the effect of online past examination papers on academic performance; and effect of online institutional repository on academic performance. The researcher guaranteed the instruments picked for the investigation yielded the ideal outcomes on knowing the impact.

Criterion validity was ensured by the researcher when results of this study were compared with other studies that had been done on the topic. For example, results gotten on the effect of e-book, e-resources, online past examination papers and online institutional repository on academic performance were compared with the findings of (Buarki & Ahmad, 2019;

Chirra & Madhusudhan, 2009) amongst other works. The studies reviewed in chapter two benefited the study in maintaining criterion validity. The study also maintained content validity by asking questions, both in questionnaires and interviews, which were easily relatable to the variables. The questionnaires avoided irrelevant questions, were clear and precise, so as to save time for the respondents. The gaps identified in reviewed literature guided towards framing questions and statements that related to e-book, e-resources, online past examination papers, online institutional repository and academic performance.

3.8 Data collection procedure

The study sought introduction letter from Kenya Methodist University (KeMU). This letter was a requirement by NACOSTI in the application for a research permit. NACOSTI issued research permit (provided in appendix VII) which gave authorized collection of data. The researcher hired only two research assistants who helped in administering questionnaires. However, the researcher himself conducted the interviews on the 2-library staff. The research assistants were trained on confidence, clear communication and listening skills. The procedures for collecting data by questionnaires and interviews were described in 3.8.1 and 3.8.2.

3.8.1 Procedures for administering questionnaires

The researcher prepared questionnaires in form of online Google forms in which administration of questionnaires began by seeking authority from the Director of JKUAT Eldoret Campus (see appendix I). When approval was issued (appendix VIII), the first step in data collection through questionnaires was contacting the librarian in Eldoret campus to obtain the contacts IT students registered as library users. Once these contacts were issued,

the researcher sent them an email with clear introduction and the reason for the study. The study did not use research assistants due to the fact that the questionnaires were issued as google forms. Once introduction was done, the researcher created Google forms as replicated on the questionnaires and sent to the students by emailing them a link for answering. The link was sent to students who had been sampled only. All this was done due to covid-19 pandemic that had prompted spontaneous closure of learning institutions.

3.8.2 Procedures for conducting telephone interview

The basic procedure was identifying the head librarian who worked in the library department and the librarian staff who provided professional library e-resource services. This was made possible after the Director of JKUAT- Eldoret campus gave the researcher the mobile contacts of the head of library and librarian in charge of e-resources. The researcher called them on phone, introduced himself and booked an appointment to conduct an interview with them at a date and time convenient to them. After they agreed, the researcher interviewed them at the agreed date and time. The interview sessions involved the researcher taking down notes on the telephone responses given by the interviewees. These responses from the two librarians were combined after the interviews for analysis. The researcher noted down the responses and did not record the sources since most of the respondents valued discretion and avoided direct quotations.

3.9 Data analysis and presentation

The collected data on questionnaires and interviews was analyzed both quantitatively and qualitatively respectively.

3.9.1 Analysis of quantitative data

Proper coding of data was done with the help of Statistical Package for Social Sciences (SPSS software, Version 22). Data from Google forms was first assembled through excel whereby various responses under questionnaire sections were included. The list was therefore easy to transfer to SPSS software. The coding involved conveying different statistics arrangements with numbers to assist in the analysis. Normality test, linearity test, heteroskedasticity test and multicollinearity test were done on the results. These tests enabled the researcher ascertain that the data to be analyzed was reliable and had minimum errors, and to help in determining the statistical tests that were used. This was followed by descriptive interpretation and detailed explanations that were utilized to introduce the conclusive outcomes of the investigation. Different computation on descriptive statistics such as mean, standard deviation, frequency and percentages were first computed. Analysis of Variance (ANOVA) was also done to compare results before and after training on e-resources was done by library staff.

Later on, linear regression was used to test each hypothesis while multiple regression analysis was done to test the overall model on the relationship between e-resources and academic performance of undergraduate information technology students of JKUAT. The model of the study was as follows:

$$\text{Academic performance} = C + \beta_1 B_{i,t} + \beta_2 I_{i,t} + \beta_3 E_{i,t} + \beta_3 R_{i,t} + e$$

Where;

B= e-books

J= e-journals

E= online past examination papers

R = online institutional repository

C = constant coefficient (intercept)

β = slope coefficient of independent variables

i = number of students

t = time

ϵ = error

In addition, this study considered GPA results of first the semester 2019 which took place before e-resources training was administered, and that of the second semester 2019 which took place after the training on e-resources was conducted by library staff.

3.9.2 Analysis of interview data (qualitative data)

Data collected from librarians during the telephone interview sessions was analyzed by content analysis technique. In each question, the two responses given were issued special codes such as A001 and A002. This aided in describing the content. Thereafter the researcher looked for patterns of responses that looked similar across the 2 librarians. When these responses were identified, they were grouped under different themes. These themes were used in analysis for production of interview report in the study.

3.10 Measurement of variables

E-books variable was quantified using five items. Both the questionnaires and interviews were used to collect data on e-books. They were measured to know the effects that e-books utilization had on academic performance of Information Technology undergraduate students of JKUAT. These 5 items from the both the questionnaires and interview questions were adapted from Cerratani et al. (2016) and Dadzie (2005).

E-resources were measured using 3 items. They were measured by the method of both questionnaires and interviews. They were measured to know the effects that e-journals utilization had on academic performance of undergraduate Information Technology students of JKUAT. These 3 items from the interview questions were adapted from Daramola (2016) and Ferguson (2017).

Online past examination papers were measured by 5 items. They were measured by the method of questionnaires and interviews. They were measured to know the effects that utilization of online past examination papers had on academic performance of undergraduate Information Technology students of JKUAT. These 5 items from the questionnaires were adapted from Harris et al. (2017). Online institutional repository was measured by 5 items. They were measured by the method of questionnaires and interviews. They were measured to know the effect that utilization of online institutional repository had on academic performance of undergraduate Information Technology students of JKUAT. These 5 items from the questionnaires were adapted from Kumar and Kumar (2008).

3.11 Ethical consideration

The study sought introduction letter from Kenya Methodist University (KeMU). This letter was attached to other documents required by NACOSTI for issuance of a research permit. NACOSTI issued the research permit (appendix VII) that gave authority to collect data. This research permit and letter of authorization in appendix I, sought consent for the study in the selected department. The principle of voluntary participation was strictly adhered to and the respondents were not coerced into participation in the research. The respondents were requested by the researcher to grant their acceptance by responding through answering the Google forms or by telephone calls. The researcher requested the interviewee for permission to record the conversation. However, they declined, hence, the researcher did not record conversations but took down notes as they gave their responses. Formal communication on confidentiality was issued through introduction letter that was sent to the respondents through their emails. Anonymity was maintained as the Google forms questionnaires did not have any personal details such as their emails. Respondents were explained to the reason for the study, noting that it was absolutely for scholarly purpose, hence privacy was guaranteed (see appendix II). Pre-testing of instruments was based on voluntary participation from the respondents and if the respondents did not want to participate, the researcher thanked them. The study was keen not to fabricate data that had been used by other studies, and incase a contribution was made by a study; in-text citations were made in the study and also the same acknowledged in the references section.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

In this chapter, the findings are introduced as guided by the objectives of the study. The findings are interpreted according to issues explored in chapter two. The motivation behind the investigation was to discover the relationship between usage of online electronic resources and scholarly performance of undergraduate IT students of Jomo Kenyatta University of Agriculture and Technology, Eldoret Campus. To start with, reliability rate of the information gathered following the response rate was given. Various responses from the respondents were later given. Linear and multiple regression analysis were likewise indicated. The chapter has given the study's results as guided by the objectives, and the hypotheses have been tested separately.

4.2 Reliability test

The study also assessed whether the research instruments would be able to amicably enable the study achieve its purpose and objectives. This was done by establishing the Cronbach's Alpha status of the research instruments used. These research instruments used were questionnaires and interview guide for head of library and library staff in charge of e-resources. According to Trizano-Hermosilla and Alvarado (2016) and Bhattacharjee (2012) the Cronbach's coefficient should be above 0.7 to be considered strong enough to be used to answer the objectives and purpose of the study. The research instruments used on various respondents had an average Cronbach's coefficient of 0.857 which indicated that the instruments were reliable to be used in the study. Questionnaires had alpha value of 0.942; interview for e-resources librarian had an alpha value of 0.856; and interview guide for head of library had an alpha value of 0.773

4.3 Response rate

The researcher had purposed to issue 105 questionnaires to IT undergraduate students, and conduct interviews to both head of library and library staff in charge of e-resource at JKUAT Library. The answered questionnaires were 84 and both interviews were conducted to satisfaction. Most of the IT undergraduate students were well versed with online survey participation since they were continuing with their syllabus through online platforms. Being able to be online at least once in every three days given that they were accessing their notes and attending their lectures put them at a better position to see the researcher's email notification on the online survey through Google forms. This response was 80% response rate, while there was 100% response rate on the interviews. The reason why all interviewees cooperated with interviewer was because of their small number at only 2 respondents. Table 4.1 indicted the responses of the study.

Table 4.1

Response Rate

Instrument	Issued	Answered	Percentage
Questionnaires	105	84	80
Interview	2	2	100

4.4 Background information of the respondents

The respondent's background information which was inquired on the research instruments, was analyzed. The order followed in the analysis began with student's information and later both the head of library and library staff in charge of e-resources.

4.4.1 Background information on students

The study concentrated on two key background information from students. This information included their gender and the academic year they were in at the time of the study. Table 4.2 indicates the results obtained.

Table 4.2.

Background Information on Students

Gender	Frequency	Percent	Cumulative Percent
Male	58	69	69
Female	26	31	100
Total	84	100	
Academic year	Frequency	Percent	Cumulative Percent
First year	34	40	40
Second year	26	31	71
Third year	15	18	89
Fourth year	9	11	100
Total	84	100.0	

The students that responded to the questionnaires were mainly male at 58 (69%) and the rest were female at 26(31%). Abubakar and Adetimirin (2016) shared the same results when they found out the number of male students in their study was 1348 while the number of female students was 937. In addition, the male students were found to utilize online

resources more than the female students. In terms of their academic years, first year students were the majority at 34(40%); second year students came second 26(31%); Third year students came third 15(18%); and fourth year students were only 9(11%). Interestingly, Alami (2016), while collecting data from Omani students, found out that majority of the respondents were first year students, trailed by second, third and lastly fourth year students. In attempt to give an explanation on the results, Alami (2016) indicated that first year's students were highly motivated and had higher academic performance followed by second year students, third year and finally fourth year students.

4.4.2 Background information on library staff

The study also gathered information from the two library staffs who were head of the library and library staff in charge of e-resources. The study concentrated on knowing how long they had stayed in their current job positions. The results gotten are presented in Table 4.3.

Table 4.3

Background Information on Library Staff

How long have you been a librarian	Frequency	Percent	Cumulative Percent
Below 1 year	0	0	0
2-5 years	0	0	0
6-9 years	1	100	100
10 years and above	0	0	100
Total	1	100	

How long have you been the head of the library	Frequency	Percent	Cumulative Percent
Below 1 year	0	0	0
2-5 years	1	100	100
6-9 years	0	0	0
10 years and above	0	0	100
Total	1	100	

Since there were just two library staff, their participation in the interview resulted to 100% response. The library staff in charge of e-resources in JKUAT indicated that she had stayed in the current position for a period of between 6-9 years. Incidentally, Al-Marabeh and Mohammad (2013) notes that one of the main reasons why e-learning has succeeded in Jordanian Higher education System is because of maximizing on the strength of having over five-year experienced staff who guided students on how to interact with e-learning queries. The head of library indicated that the duration of stay in the current position was between 2-5years. Comparatively, Al-kharang and Ghinea (2013) observes that most head of library staffs in the Kuwait did not stay long in one education institution. As a result, these institutions often look for new heads of library services. Looking at the scenario, Al-

kharang and Ghinea (2013) had mainly studied public institutions which were also similar with the current study, where the head of the library had only stayed for less than 5 years in the institution. Marabeh and Mohammad (2013) and Al-kharang and Ghinea (2013) notes that the more a library staff has worked in a library, the more they are well versed with activities that promote better use of e-resources and academic performance of students who sought their guidance in the library.

4.5 Diagnostic tests

The researcher had a mandate to ensure that regression assumptions are fulfilled. That is, to ensure suitability of statistical tests for the data. The study conducted diagnostic tests such as normality tests, linearity, heteroskedasticity test and multicollinearity tests. They were explained in the sections 4.5.1 to sections 4.5.4.

4.5.1 Normality test

The researcher noticed that due to the suitability of the number of respondents being more than fifty, Kolmogorov-Smirnov test was most suitable to use. The Kolmogorov-Smirnov test dictates that P should be greater than 0.05 (Ghasemi & Zahediasl, 2012). The results indicated in Table 4.4 show that the Asymp. Sig. (2-tailed) were all greater than 0.05 (X1, $P= .111$; X2, $P= .360$; X3, $P=.242$; X4, $P= .524$; Y, $P=.141$). The results are indicated in Table 4.4.

Table 4.4*Normality Test: One-Sample Kolmogorov-Smirnov Test*

		Y	XI	X2	X3	X4
N		84	84	84	84	84
Normal Parameters ^{a,b}	Mean	22.5119	17.2857	24.1429	28.2262	16.5119
	Std. Deviation	3.47277	4.74550	3.71627	2.04380	4.33949
Most Extreme Differences	Absolute	.227	.131	.294	.200	.089
	Positive	.145	.094	.206	.193	.089
	Negative	-.227	-.131	-.294	-.200	-.063
Kolmogorov-Smirnov Z		2.084	1.203	2.696	1.834	.812
Asymp. Sig. (2-tailed)		.141	.111	.360	.242	.524

a. Test distribution is Normal.

b. Calculated from data.

4.5.2 Linearity test

Linearity was tested using the Pearson correlation coefficient (Schober et al., 2018). The findings were shown in Table 4.5

Table 4.5*Linearity Test: Pearson Correlation*

		Academic performance	Online past examination papers	e-books	Online institutional repository	e-journals
Academic performance	Pearson Correlation	1	.715**	.312**	.109	.652**
	Sig. (2-tailed)		.000	.004	.003	.000
	N	84	84	84	84	84
Online past examination papers	Pearson Correlation	.715**	1	.235*	.004	.934**
	Sig. (2-tailed)	.000		.001	.009	.000
	N	84	84	84	84	84
e-books	Pearson Correlation	.312**	.235*	1	-.209	.178
	Sig. (2-tailed)	.004	.001		.006	.004
	N	84	84	84	84	84
Online institutional repository	Pearson Correlation	.109	.004	.209	1	-.038
	Sig. (2-tailed)	.023	.009	.006		.004
	N	84	84	84	84	84
e-journals	Pearson Correlation	.652**	.934**	.178	-.038	1
	Sig. (2-tailed)	.000	.000	.004	.004	
	N	84	84	84	84	84

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

* . Correlation is significant at the 0.05 level (2-tailed).

From Table 4.5, the online past examinations papers had a significant influence on academic performance of $r = .715$, $p=0.000$. E-books had a significant influence on

academic performance of $r = .312$, $p = 0.004$; online institutional repository had a significant influence on academic performance of $r = .109$, $p = 0.003$; e-journals had a significant influence on academic performance of $r = .652$, $p = 0.000$. All the p values were less than 0.05, hence, there was a positive linear relationship between academic performance and online past examinations papers, e-books, online institutional repository and e-journal. Schober et al. (2018) advises that the more the p values are inclined away from 0.05, the stronger the linearity relationship that exists.

4.5.3 Heteroskedasticity test

Heteroskedasticity test was also done on the variables and the results presented in Table 4.6. Table 4.6 shows that the significance levels of all the variables were above 0.05, hence, there was no heteroskedasticity issue (Li & Yao, 2019). However, though the total response rate was 84 responses, there was one outlier due to heteroskedasticity issue which was handled by adjusting the regression coefficients of the study as indicated on Table 4.6. The adjusted coefficients were indicated on bold by the researcher.

Table 4.6*Heteroskedasticity Test*

	B	Std Error^a	Beta^a	T	Sig
(Constant)	2.666	4.463		.589	.545
e-books	.498	.156	.681	3.157	.169
e-journals	.169	.074	.182	2.275	.182
Online past examination papers	.252	.130	.148	1.911	.195
Online institution repository	-.138	.168	-.017	-.083	.062

a. Dependent Variable: Academic performance

4.5.4 Multicollinearity test

The regression analysis assumed that there was no multicollinearity between variables. To test for multicollinearity, Variance Inflation Variable (VIF) or tolerance were used. Using the VIF method, a tolerance of less than 0.20 and a VIF of more than 5 indicated a presence of multicollinearity (Bryman, 2016).

Table 4.7*Multicollinearity Test*

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
E-books	.221	1.332
E-journals	.883	1.133
Online past examinations paper	.940	1.064
Online institutional repository	.225	1.346

Table 4.7 VIF values of various variables were all less than 5, with a tolerance of above 0.20.

4.6 Academic performance of IT students

This study showed that e-books, e-journals, online past examination papers, online institutional repository amongst others had influenced academic performance of students.

The results are shown in Table 4.8.

Table 4.8*Descriptive Statistics on Academic Performance*

Statements N=84	1	2	3	4	5	Mean	Std Dev
E-books have improved the academic performance	6(7%)	32(38%)	0(0%)	46(55%)	0(0%)	3.02	1.11
E-journals have improved the academic performance	1(1.2%)	15(17.9%)	0(0%)	43(51.2%)	25(29.8%)	3.90	1.06
E-exams papers have improved the academic performance	1(1.2%)	1(1.2%)	0(0%)	8(9.5%)	74(88.1%)	4.82	0.60
E-repository has improved the academic performance	8(9.5%)	29(34.5%)	2(2.4%)	44(52.4%)	1(1.2%)	3.01	1.15
E-newspapers has improved academic performance	3(3.6%)	34(40.5%)	0(0%)	45(53.6%)	2(2.4%)	3.11	1.09
Posting of e-results on time has motivated students	1(1.2%)	1(1.2%)	0(0%)	23(27.4%)	59(70.2%)	4.64	0.67
Average Mean						3.75	0.95

The results shown in Table 4.8 indicates that academic performance statements had an average mean of 3.75 and standard deviation of 0.95. This indicates that responses given were cohesively interrelated, hence did not disperse over a large area. The respondents agreed that utilization of online past examination papers had improved their academic performance. This statement had a mean of 4.82. The respondents also disagreed that utilization of online institutional repository had improved their academic performance. This statement had a mean of 3.01. Various past studies such as (Filade, 2019; Harris et al., 2017; Hojo, 2012; Katalabwa, 2016) confirms that academic performance is affected by various factors such as exposure on e-resources, peer group influence, self-efficacy, ethnic identity, gender, and socioeconomic status. However, utility of various e-resources was named as the most important factor in determining the academic performance of students in a university.

In modern knowledge and learning environment, undergraduate students need to agree to the simple rule that electronic resources are now, perhaps more than ever before, the backbone of academic services in universities. Acknowledging this will lead to proper utilization of e-resources and derive utmost satisfaction leading to improved academic performance.

4.7 Average academic performance improvement of IT students at JKUAT

There was need to know whether academic performance improved when undergraduate students were trained on utilization of e-resources.

4.7.1 Descriptive Statistics on Average Performance in First Semester 2019/2020

Students were required to show their average GPA or semester grades in 2019, that is, 1-Above 70 (GPA 4.0); 60-69 (GPA 3.0); 50-59 (GPA 2.5); 40-49 (GPA 2.0); and 5-Below 40 (GPA 1) by ticking in the questionnaires. The students had already received their annual 2019/2020 results by the time the study collected data. The results were indicated in Table 4.9.

Table 4.9

Average Academic Performance in First Semester for Undergraduate IT students 2019/20

Statements	GPA	GPA	GPA	GPA	GPA	Mean	Std
N=84	4.0	3.0	2.5	2.0	1.0		Dev
Average semester grade before e-resources training	18(21%)	32(38%)	24(29%)	5(6%)	5(6%)	0.98	2.12

According to the results on Table 4.9, most students had GPA 3.0 and 2.5 respectively in their end of first semester examinations in 2019/2020. Those with GPA 3.0 were 32(38%) while those with GPA 2.5 were 24 (29%). The average mean was 0.98 with a standard deviation of 2.12 proving the grades were highly dispersed.

4.7.2 Descriptive Statistics on Average Performance in Second Semester 2019/2020

Students were required to show their average GPA or second semester grade in 2019/2020. That is, 1-Above 70 (GPA 4.0); 60-69 (GPA 3.0); 3-50-59 (GPA 2.5); 40-49 (GPA 2.0); and 5-Below 40 (GPA 1) by ticking in the questionnaires. It was noted after training on e-resources was done, there were improvements as tabulated on Table 4.10.

Table 4.10

Average Academic Performance in First Semester for Undergraduate IT students 2019/20

Statements	GPA	GPA	GPA 2.5	GPA	GPA	Mean	Std Dev
N=84	4.0	3.0		2.0	1.0		
Average semester grade in after e-resource training	52(70%)	32(30%)	0(0%)	0(0%)	0(0%)	1.38	0.49

Tables 4.10 indicated that most IT student's average performance was GPA 4.0 and 3.0 respectively. They had a mean of 1.38, and a standard deviation of .49 meaning they were somehow less dispersed contrary to the first semester results. This indicated that performance of students had greatly improved as a result of availability of e-resources in JKUAT University, Eldoret campus. Manjack et al. (2019) agrees that undergraduate performance in Nigeria, specifically in Gombe State, was boosted due to improved use of electronic resources.

It can thus be concluded that proper utilization of e-resources has a positive impact towards improving semester results. Therefore, the university should ensure that improvement remains constant by always availing e-resources to undergraduate students.

4.7.3 ANOVA on Average Performance comparison between first and Second Semester in 2019/2020

The study conducted analysis of variance on academic performance comparison between first and second semester in 2019/2020. The results were shown in Table 4.11.

Table 4.11

ANOVA analysis on Average Academic Performance in First and Second Semester 2019/2020

		Sum of Squares	Df	Mean Square	F	Sig.
Average semester grade in the first semester in 2019	Between Groups	33.880	3	11.293	.934	.041
	Within Groups	967.108	80	12.089		
	Total	1000.988	83			
Average semester grade in the second semester in 2019	Between Groups	19.430	2	19.430	1.623	.006
	Within Groups	981.558	81	11.970		
	Total	1000.988	83			

Table 4.11 indicated that after undergraduate students were trained on e-resources the variance within groups was smaller than the variance between groups, hence, the F-test had a higher F-value of 1.623. This proved that there was a higher likelihood that the difference observed in academic performance was higher in second semester as compared to the first semester.

4.8 Utilization of e-books at JKUAT- Eldoret campus

Objective one was to assess the influence of utilization of e-books on academic performance of IT students at JKUAT. The variable had some elements such as electronic publication (EPB), mobi pocket (MOBI), AZW3 e-book, I-book (IBA) and portable document format (PDF). The students answering questionnaires were asked how utilization of e-books influenced academic performance of IT undergraduate students at JKUAT. There were statements that the respondents were supposed to use, viz; 1-Strongly disagree, 2-disagree, 3- Neither agree nor disagree, 4- Agree, 5- Strongly agree; in rating on how utilization of e-books influenced academic performance of IT students at JKUAT. The researcher was keen on establishing the impact of utilizing electronic publication (EPB), mobi pocket (MOBI), AZW3 e-book, I-book (IBA) and portable document format (PDF). Table 4.12 shows the results.

Table 4.12

Descriptive Statistics of E-books at JKUAT- Eldoret Campus

Statements	1	2	3	4	5	Mean	Std Dev
Relevant, knowledge from e-books	0(0%)	36(43%)	0(0%)	48(57%)	0(0%)	3.14	.99

Training has improved accessing e-books	3(3.6%)	34(41%)	0(0%)	45(54%)	2(2.4%)	3.11	1.09
Plenty of computer devices to access e-books	32(38%)	16(19%)	12(14%)	11(13%)	13(16%)	2.49	1.49
Stable internet to get e-books	34(40.5%)	16(19.0%)	8(9.5%)	14(16.7%)	12(14.3%)	2.45	1.51
E-books with videos, sounds and images are there	5(6.0%)	32(38.1%)	0(0%)	46(54.8%)	1(1.2%)	3.07	1.11
E-books gives students relevant revision content	6(7.1%)	32(38.1%)	0(0%)	46(54.8%)	0(0%)	3.02	1.11
Average Mean						2.88	1.21

Table 4.12 indicated that e-books statements had an average mean of 2.88 and standard deviation of 1.21. This mean was among the least means derived in this study. This affected the standard deviation to be high which indicated that values derived from the study spread out in a large area far from the mean. The most consented statement had a mean of 3.14. This indicated that there was availability of different e-books that could be stored in

phones, tablets and computers. These e-books had enabled the students to acquire relevant, fast and convenient knowledge required to do their assignments within or out of campus. The most disagreed statement which had the lowest mean in this category had a mean of 2.45 on efficient internet connectivity which greatly reduced the time required to download different chapters of electronic books through phones, tablets and computers.

It could thus be proved that JKUAT Eldoret campus internet connectivity was not efficient. Apart from that, indicators of expectation to utilize e-books by students was seen to be inhibited by absence of information, negative perspectives; and insufficient and constrained foundation. In this way, higher use of e-books in academic libraries were seen when there was satisfactory substance and administration quality; information and access to the innovation; accessibility of the essential computers; ease of convenience; and student's very own attributes, such as, education level. A prior study by Alshahrani et al. (2017) found out that one of the impacts of e- resources that has been boosting student–lecturer connection in higher education was the availability of e-books. This was because e-books served both the interests of both the student and the lecturer; and both of them have a common ground on accessibility of content on e-books.

These sentiments were also shared by Amayah (2013) who points out that an e-book is one of the sources of information that is commonly shared in a public sector organization. Aharony (2014) while utilizing structural equation modeling, on data from a sample of 169 respondents, argues that supposed practicality, supposed effortlessness of application, individual innovativeness and other particular features, were prognosticators of student's intent to utilize e-books. Walters (2013) remarks that the actual utilization of e-books was essential as compared to acceptance by students.

The study conducted interview on library staff in charge of e-resources at JKUAT Eldoret campus. The researcher inquired on various aspects related to the variables of the study. These aspects were e-books, e-journals, online past examination papers and online institutional repository. On the utilization of e-books and academic performance, the researcher had inquired what was the average download rate of e-books by students was in the first and second semesters consecutively. The interviewees' response was averagely 250 e-books per month in the first semester and 350 per month in the second semester in 2019. Berzins and Hudson (2011), while considering a snapshot of basic utilization of e-resources in London institutions, discovered that e-books were among the mostly used e-resources in the institutions.

The researcher inquired on the challenges that the library staff in charge of e-resource faced when offering services. The responses included challenges such as slow internet power interruptions, limited retrieval skills, slow-computers. Chirra and Madhusudhan (2009) named limited retrieval skills and slow internet as problems affecting the full potential utilization of e-books among the doctoral students in Indian Goa University. Power interruption was mentioned by Deng (2010) as a developing pattern and drifts in limiting full exploitation of e-resources.

The study conducted interview on head of library at JKUAT Eldoret campus. The researcher inquired on various aspects related to the variables of the study. The researcher inquired on what e-resources policy cover in terms of guiding what e-resources users, such as students, should conform to. The head of the library stated that e-resources policy covers are anchored on electronic format, connectivity, and downloadable content. A previous study by Spalding and Wang (2006) explains that as academic libraries were marketing

themselves in America, most concerns emanated from what types, and how well their policies were formulated to cover all the needs of future library users. Poor articulation of these policies will led to low library registration by users.

From the foregoing results, it was established that e-books portability made it easier for the students and also library staff to utilize them effectively. The e-books users were able to easily access-books via various media such as phones, tablets and computers; and had a chance to share them further to other users. That notwithstanding, internet connectivity was a challenge experienced by e–books users.

4.8.1 Model summary of e-books

In assessing the influence of utilization of e-books on academic performance of IT students at JKUAT, the study measured hypothesis. The first hypothesis indicated that the utilization of e-books had no relationship with academic performance of the undergraduate’s Information Technology students at JKUAT. Table 4.13 indicated that e-books had an R value of .312.

Table 4.13

Model Summary of E-books

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
E-books	.312 ^a	.397	.382	3.319

b. Predictors: (Constant), e-books

The P value of constant is significant (.000), hence R square value was used. The R square value of 0.397 implied that e-books predicted 39.7% of the variability in the academic performance.

4.8.2 Analysis of variance for linear relationship of E-books and academic performance

In measuring the linear relationship between the independent variables and dependent variable in this study, the researcher assessed the p value in the ANOVA Table 4.14. The ANOVA had a significant p-value which was 0.000, which was lower than 0.05 significance level. In the relationship between e-books and academic performance, the study found out that e-books were statistically significant and could be used to predict academic performance. Therefore, null hypothesis was rejected since e-books were key factors of academic performance. Confirmation from Walters (2013) was made when the study dispensed the notion that e-books in academic libraries were irrelevant towards academic improvement as compared to other e-resources. The results are indicated in Table 4.14.

Table 4.14

ANOVA for E-Books and Academic Performance

Model		Sum of Squares	Df	Mean Square	F	Sig.
E-books	Regression	397.236	1	397.24	8.823	.000 ^b
	Residual	903.752	82	2.572		

- a. Dependent Variable: Academic performance
- b. Predictors: (Constant), e-books

4.8.3 Regression coefficients for e-books

The study conducted the regression coefficients for e-books as indicated on Table 4.15.

Table 4.15

Regression Coefficients for E-Books and Academic Performance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	15.480	2.395		6.464	.000
E-books	.291	.098	.312	2.970	.004

- a. Dependent Variable: Academic performance

Table 4.15 showed that the unstandardized coefficients constant value was 15.480, which was significant, hence the beta value was 0.291 at $p < 0.004$. This further showed that e-books separately added to academic performance by 0.291. Adeniran (2013) additionally considered these elements while deciding the use of e-resources by university students and uncovered that the utilization of e-resources had huge effect on the academic performance of the students. Nonetheless, there is a requirement for students to get more aptitudes in the utilization of e-resources.

4.9 Utilization of e-journals at JKUAT- Eldoret campus

The second objective was to examine the influence of utilization of e-journals on academic performance of IT students at JKUAT. The variable had elements such as scholarly e-

journals, general public journals and industry e-journals. The students answering questionnaires were asked how utilization of e-journals influenced academic performance of IT students at JKUAT. There were statements that the respondents were supposed to choose, viz; 1-Strongly disagree, 2-disagree, 3- Neither agree nor disagree, 4- Agree, 5- Strongly agree) in rating how utilization of e-journals influenced academic performance of IT students at JKUAT. The researcher was keen on establishing how utilization of e-journals had impacted scholarly e-journals, general public journals and industry e-journals. Table 4.16 shows the results.

Table 4.16

Descriptive Statistics of E-Journals at JKUAT- Eldoret Campus

Statements	1	2	3	4	5	Mean	Std Dev
N=84							
Accessibility of e-journals for research	0(0%)	30(36%)	0(0)	48(57%)	6(7%)	3.36	1.05
Availability of various	0(0%)	15(18%)	0(0)	43(51%)	26(31%)	3.95	1.02

non-academic electronic journals							
High consultation on e-journals by students	0(0%)	9(11%)	0(0)	43(51%)	32(38%)	4.17	.89
Reference of previous thesis by students	0(0%)	5(6%)	0(0)	43(51%)	36(43%)	4.31	.76
Relevant information on e-journal by students	0(0%)	1(1.2%)	0(0)	43(51%)	40(48%)	4.45	.57
Plan and expression of logical arguments when responding to exam	1(1%)	15(18%)	0(0%)	43(51%)	25(30%)	3.90	1.06
Average Mean						4.02	0.8

Table 4.16 indicates that e-journal statements had an average mean of 4.02 and standard deviation of 0.8. This standard deviation indicated that the values of the variable were close to the mean. The respondents agreed, with a mean of 4.45, that e- journals had enabled students have relevant information on different types citations and references which were used when citing assignments and in group discussions. The respondents also disagreed with a mean of 3.36 that when doing academic research, students were able to access electronic journals through the library which greatly improved the quality of the research.

These findings indicated that there was a major problem with accessing e-journals by undergraduate students at JKUAT Eldoret campus.

In the University of Karachi, Ansari and Zuberi (2010) indicated that e-journals utilization among the university users played a significant role in disseminating information and was highly used. Malemia (2014) added that, e-journals are more used in areas where awareness points are very high and utilizers are issued satisfactory training. Kwadzo (2015) stressed on the necessity for awareness creation in utilizer amenities. He further adds that confines like poor search skills, insufficient ICT set-up, and poor downloading time were some of the challenges affecting maximum utilization of e-journals (Kwadzo, 2015).

The second section was on the influence of utilization of e-journals on academic performance. The researcher inquired on the average download rate of e-journals by students in the first and second semesters in 2019 consecutively. The response was 300 e-journals per month in the first semester and 400 e-journals per month in the second semester in 2019. Daramola (2016) seemed to share the same ideology when he was indicated that 500 e-journals download per month was small while considering the kind of perception that existed on undergraduate students in Akure University. Daramola (2016) had noticed that students rarely utilized e-resources such as e-journals. The researcher inquired on the challenges faced by a librarian when offering services on e-journals. The librarian gave challenges such as low skills, low subscription, and low internet. According to Ganaie and Rather (2015) and Gakibayo et al. (2013) low utilization of e-resources in Mbarara University was partly attributed to few subscriptions by students; librarians not skilled to assist students; and unreliable internet services. These factors were inhibiting student interaction with the e-resources provided for by the university.

The study conducted interview on head of library at JKUAT Eldoret campus. The researcher inquired on what proportion of the library budget was spent on e-resources functions. The head of the library stated that 20 percent was allocated to e-resources. This has been a very interesting phenomenon and has been attracting various contributions from past researchers, such as (Oviogbodu & Okorie, 2015; Oyedapo & Ojo, 2013; Olofinsawe & Oyeniyi, 2010). These authors termed budget allocation as one of the key factors that measures how well a university management is prepared to handle growing demands of use of library services. These authors give varied estimation of budgets that should be used in a -library set-up, ranging between 15 to 40 percent of the library budget.

From the results, it was evident that students' level of awareness of the e-journals services offered at the university was high. The students had good basic computer and internet skills; however, they lacked more advanced skills, and this negatively affected their use of e-journal resources. The students used the Internet for various purposes, including to study and do research.

4.9.1 Model summary of e-journals

In examining the influence of utilization of e-journals on academic performance of IT students at JKUAT, the study measured hypothesis. The second hypothesis indicated that the utilization of e-journals had no relationship with academic performance of the undergraduate Information Technology students at JKUAT. Table 4.17 indicates that e-books had an R value of .652.

Table 4.17

Model Summary of E-journals

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
E-journals	.652 ^a	.626	.616	.78144

b. Predictors: (Constant), e-journals

The P value of constant is significant (.000); hence, R square value was used. The R square value of 0.626 implied that e-books predicted 62.6% of the variability in the academic performance.

4.9.2 Analysis of variance for linear relationship of e-journals and academic performance

In the relationship between e-journals and academic performance, the study found out that e-journals were statistically significant and could be used to predict academic performance. The ANOVA had a significant p-value which was 0.000; which was lower than 0.05 significance level. Therefore, null hypothesis was rejected since e-journals were key factors of academic performance. Similar findings were obtained by Tlakula and Fombad (2017) when they ascertained that e-resources, such as e-journals, play an important role in shaping the academic performance of students in the University of Venda in South Africa. The results are given in Table 4.18.

Table 4.18

ANOVA for E-journals and Academic Performance

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	626.002	1	626.002	60.753	.000 ^b

E-journals	Residual	574.986	82	7.012
	Total	1000.988	83	

a. Dependent Variable: Academic performance

b. Predictors: (Constant), e-journals

4.9.3 Regression coefficients for e-journals and academic performance

The study analyzed the regression coefficients of e-journals and tabulated the results in Table 4.19.

Table 4.19

Regression Coefficients for E-journals and Academic Performance

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	13.892	1.143		12.153	.000
E-journals	.522	.067	.652	7.794	.000

a. Dependent Variable: Academic performance

The outcome on Table 4.19 indicated that at an insignificant constant value of 13.892 at $p < 0.000$, the e-journals beta value was 0.522 at $p < 0.000$. That is, individually e-journal increased academic performance with 0.522. Renwick (2005) proved that when the medical science students kept downloading and using e-journals, their academic performance was boosted.

4.10 Utilization of online past examination papers at JKUAT-- Eldoret campus

The third objective was to determine the influence of utilization of online past examination papers on academic performance of IT students at JKUAT. The variable had some elements such as school-based e-papers, essay e-papers, problem-based e-papers, audio e-papers and multiple-choice e-papers. The students answering questionnaires were asked how utilization of online past examination papers influenced their academic performance of IT students at JKUAT. There were statements that the respondents were supposed to 1- Strongly disagree; 2- disagree; 3- Neither agree nor disagree; 4- Agree, 5- Strongly agree; on how utilization of online past examination papers influenced academic performance of IT students at JKUAT. The researcher was keen on establishing how utilization of online past examination papers was impacted by school-based e-papers, essay e-papers, problem-based e-papers, audio e-papers and multiple-choice e-papers. Table 4.20 indicates the results.

Table 4.20*Descriptive Statistics of Online Past Examination Papers at JKUAT-Eldoret Campus*

Statements N=84	1	2	3	4	5	Mean	Std Dev
Better revision due to e-exams	0(0%)	0(0%)	0(0%)	28(33.3%)	56(66.7%)	4.67	.474
Group discussion content is gotten from exams	1(1.2%)	1(1.2%)	0(0%)	27(32.1%)	55(65.5%)	4.60	.679

Students have developed their answering techniques of exams	0(0%)	0(0%)	0(0%)	20(23.8%)	64(76.2%)	4.76	.428
The imagination level of students has been expanded	1(1.2%)	1(1.2%)	0(0%)	15(17.9%)	67(79.8%)	4.74	.642
E-essays have enabled students excel in exams	1(1.2%)	1(1.2%)	0(0%)	23(27.4%)	59(70.2%)	4.64	.670
Improvement of confidence level	1(1.2%)	1(1.2%)	0(0%)	8(9.5%)	74(88.1%)	4.82	.604
Average Mean						4.7	0.58

Table 4.20 indicated that online past examinations papers statements had an average mean of 4.7 and standard deviation of 0.58. This was the highest means derived from the study. In consideration of the standard deviation, the study showed that the responses were closest to the mean value than in this study. This was the highest mean in this study. The respondents agreed with at a mean of 4.84, that their confidence level had been improved during examinations due to adequate revision of various online past papers. The respondents also disagreed with at a mean of 4.60, that students get group discussion content by accessing problem-based electronic papers. This clearly indicated that the

content quality in online past examination papers was low. Studies done before by Badu and Markwei (2005) disagreed with the findings, stating that University of Ghana students had majorly been using internet to download past examination papers for their revision. Cerratani et al. (2016) agreed that students in universities have been utilizing ICT to access past examinations for preparing psychologically to do an exam. This showed that the content quality in past examination papers was high. It was noted that when students do this, they were psychologically stable to complete their courses.

Other previous studies such as Alzubi (2015) analyzed the effect of electronic tests on undergraduate students' accomplishment in an English course. Electronic test was evaluated on 58 undergraduate students, and it was noted that the scores of undergraduate students were measurably critical on the academic accomplishment. Basaran et al., (2016) indicated the significance of electronic examination papers or tests as far as employees are concerned. The examination demonstrated that employees can secure quick outcomes and improve training. Harris and Al-Bataineh, (2015) also bolstered the effect of electronic examinations and uncovered that the computer usage can be of huge source of enthusiasm for undergraduate students and educators in improving academic accomplishment in institutions.

The third variable in the study concerned the influence of utilization of online past examination papers on academic performance of students. The researcher inquired on the types of past papers that were available in the library database. The interviewee enumerated these types as semester examination papers and seminar proceedings. These findings are consistent with Lan (2018) who notes that there were high e-exam papers downloads in

academic institutions in China. Mawere and Sai (2018) whose study was based in Great Zimbabwe University, observes that university databases keep both previous exams and research seminar proceedings for any future reference. Their study provides a good comparison of Lan (2018) in developing nations. The researcher inquired on what was the average download rate of online past examination papers in the first and second semester in 2019 consecutively. The librarian stated that there was an average of 700 papers in the first semester and 900 papers in the second semester in 2019. Though not giving the exact figure, Mittal and Bala (2013) indicated that e-past examination papers were among the most utilized e-resource items on university databases.

The researcher inquired on the challenge's librarians faced when offering services on online past examination papers. The challenges were stated as missing papers, internet, and power interruptions. In Tanzania, Mosha and Bea (2014) noted inconsistencies in e-resources as one of the blockages of utilizing internet resources in higher learning institutions, such as Mzumbe University. They explained that whenever students fail to get e-resources that they are looking for, their search interest in the university database is inhibited.

The study conducted interview on head of library at JKUAT Eldoret campus. The researcher inquired what measures have been taken to ensure that bandwidth of the library serves JKUAT Eldoret library students better, as compared to other libraries. The head of the library stated that there were two different servers. He stated that one was dedicated to serving the physical library, while the other was dedicated to library online users who access materials remotely. However, Wi-Fi was restricted to the 6th floor where the library is located, and for one to access it, they need to use password. A study by Nwagwu et al.

(2009) had a different view as pertained how equipped University of Ibadan, Nigeria was. Nwagwu et al. (2009) pointed out that the university had a server for each school in the university and free internet was available within the institution.

In conclusion it has been noted that the online past papers have boosted student's confidence and enabled them to be well versed with examination questions. However, an issue such as poor computer accessibility has become a limitation, thereby demotivating students to pursue their quench for past examination papers.

4.10.1 Model summary of online past examination papers

In determining the influence of utilization of online past examination papers on academic performance of IT students at JKUAT, the study measured hypothesis. The third hypothesis indicated that the utilization of online past examination papers had no relationship with academic performance of Information Technology undergraduate students at JKUAT, Eldoret Campus. Table 4.21 indicates that e-books had an R value of .715.

Table 4.21

Model Summary of Online Past Examination Papers

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Online past examination papers	.715 ^a	.711	.705	2.443

b. Predictors: (Constant), online past examinations papers

The P value of constant is significant (.000), hence, R square value was used. The R square value of 0.711 implied that e-books predicted 71.1% of the variability in the academic performance.

4.10.2 Analysis of variance for linear relationship of online past examination papers and academic performance

In the relationship between online past examination papers and academic performance, the study found out that online past examination papers were statistically significant and could be used to predict academic performance. The ANOVA had a significant p-value of 0.000, which was lower than 0.05 significance level. Therefore, null hypothesis was rejected since online past examination papers were key factors of academic performance. Tadesse et al. (2018), concurring with the statement, agrees that students that engaged in accessing e-assessment papers, were able to develop academically and their examinations results got validation more than those who did not. The results are indicated in Table 4.22.

Table 4.22

ANOVA for Online Past Examination Papers and Academic Performance

Model		Sum of Squares	Df	Mean Square	F	Sig.
Online past examination papers	Regression	711.424	1	711.42	85.662	.000b
	Residual	489.564	82	5.970		
	Total	1000.988	83			

a. Dependent Variable: Academic performance

b. Predictors: (Constant), online past examinations papers

4.10.3 Regression coefficients for online past examination papers and academic performance

The study analyzed regression coefficients for online past examination papers and academic performance. Table 4.23 gives the findings generated.

Table 4.23

Regression Coefficients for Online Past Examination Papers and Academic Performance

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	13.470	1.013		13.302	.000
Online past examination papers	.523	.057	.715	9.255	.000

a. Dependent Variable: Academic performance

The findings from Table 4.23 explains that at constant value of 13.470, which was insignificant at $p < 0.000$, online past examination papers had a beta value of 0.523 at $p < 0.000$. In Zimbabwe, Mawere and Sai (2018) confirmed that electronic past examination papers has played a significant role towards improving academic performance in Great Zimbabwe University.

4.11 Utilization of online institutional repository at JKUAT- Eldoret campus

The fourth objective was to determine the influence of utilization of online institutional repository on academic performance of IT students at JKUAT. The variable had some elements such as administrative documents, course notes, academic reports, conference proceedings and e-thesis and dissertations. The students answering questionnaires were

asked how utilization of online institutional repository had influenced academic performance of IT students at JKUAT. There were statements that the respondents were supposed to: 1-Strongly disagree; 2-disagree; 3- Neither agree nor disagree; 4- Agree; and 5- Strongly agree; on how utilization of online institutional repository influenced academic performance of IT students at JKUAT. The researcher was keen on establishing how utilization of online institutional repository had impacted by school-based e-papers, essay e-papers, problem-based e-papers, audio e-papers and multiple-choice e-papers. Table 4.24 indicates the results.

Table 4.24

Descriptive Statistics of Online Institutional Repository at JKUAT- Eldoret Campus

Statements N=84	1	2	3	4	5	Mean	Std Dev
Course notes online availability	11(13%)	37(20%)	0(0%)	36(43%)	0(0%)	2.73	1.15

Insight on project format guideline	7(8%)	34(41%)	1(1%)	39(46%)	3(4%)	2.96	1.16
Development of student's interpretation skills	34(41%)	16(19%)	13(16%)	9(11%)	12(14%)	2.39	1.46
There has been positive group cohesion and improved grades	33(39%)	16(19%)	10(12%)	14(17%)	11(13%)	2.45	1.47
Cost effectiveness	7(8%)	33(39%)	3(4%)	38(45%)	3(4%)	2.96	1.15
Morale boost due to access to e-thesis	8(10%)	29(35%)	2(2%)	44(52%)	1(1%)	3.01	1.14
Average Mean						2.75	1.26

The results in Table 4.24 shows that online institutional repository' statements had an average mean of 2.75, and a standard deviation of 1.26. This was the least mean value derived in this study, as compared to other variables, and it was greatly hampered by respondents giving feedback that was largely spread across a large area which was far from the mean. This was the lowest mean in this study. Respondents 'agreed with' at a mean of 3.01 that e-thesis had boosted the morale of students to get interested in various thought-

provoking research areas that required attention around them hence able to contribute in various fields.

The respondents also 'disagreed with' at a mean of 2.39 that students had been able to develop their interpretation skills required during exams when they accessed various reports online. This was a clear elaboration that in as much as morale of students was boosted by presence of online institutional repositories, such as e-thesis, there was still a gap of interpretation of the information by students. Croteau et al. (2015) and Egberongbe (2011) disagrees with the findings of our study since they named institutional repository as one of medium through which information is passed to students. However, their study concentrated on post-graduate students only, while in our case, we concentrated on undergraduate students. Ferguson (2017), in agreement, confirms that open educational resources and institutional repositories depend on the user's awareness when utilizing them.

The last section was the influence of utilization of online institutional repository on academic performance of students. The researcher inquired on the types of documents uploaded in the online institutional repository. The types stated were theses, project, conference papers, speeches, course materials. According to *Hennessy* and Lynch (2017) the ability of both students and teachers to access course materials in library repositories was a major boost to improving academic performance in Ireland.

The researcher inquired on the average download rate of online institutional repository by students in the first and second semester in the year 2019. The average download rate stated was 400 documents in the first semester and 500 in the second semester. Reading culture by students can be forecasted according to how many documents that are downloaded in a

repository (Quadri & Quadri, 2015). Though Quadri and Quadri (2015) were mainly focused on newspapers downloads, it became clear that faculty staff can tell a lot and develop policies by just observing how many various documents have been downloaded in a repository in a particular period. The researcher finally inquired on the challenges librarians faced when offering services on online institutional repository. The challenges were stated as broken URL links, lack of current records, limited content and internet.

The study conducted interview on head of library at JKUAT Eldoret campus. The researcher inquired on how the head of library can identify a competent library staff from how they run their responsibilities. The response given indicated that confidence, efficiency, skills and technical know-how were some of the observable characteristics in a competent library staff. Rotich and Munge (2013) discovered that for e-resources initiatives to become effective, competencies such as skills and technical knowledge was needed for library officers in Kenyan universities libraries. The researcher inquired on how equipped the library staff were to ensure that they responded to queries related to e-resources in the university library. The head of the library stated that the library was equipped on the level of awareness of the availability of resources, skills, professionalism and trainings on e-resources. Mittal and Bala (2013) recommended that for utilization of e-resource to increase, universities need to organize refresher training on e-resources for the library staff since e-resources keeps on changing.

In conclusion, although students were found to have a positive perception of institutional repositories and they were increasingly using them, the study found awareness and adoption to be low. Student awareness of institutional repositories services which includes self-archiving was low.

4.11.1 Model summary of online institutional repository

In measuring the influence of utilization of online institutional repository on academic performance of IT students at JKUAT Eldoret Campus, the study measured hypothesis. The fourth hypothesis indicated that the utilization of online institutional repository had no relationship with academic performance of the Information Technology undergraduate students at JKUAT. Table 4.25 indicates that e-books had an R value of .109.

Table 4.25

Model Summary Online Institutional Repository

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Online institutional repository	.109 ^a	.212	.201	3.473

b. Predictors: (Constant), online institutional repository

The P value of constant is significant (.000), hence, R square value was used. The R square value of 0.212 implied that e-books predicted 21.2 % of the variability in the academic performance.

4.11.2 Analysis of variance for linear relationship of online institutional repository and academic performance

In the relationship between online institutional repository and academic performance, the study found out that online institutional repository was statistically significant and could be used to predict academic performance. The ANOVA had a significant p-value which was 0.000, and which was lower than 0.05 significance level. Therefore, null hypothesis

was rejected since online institutional repository was a key factor of academic performance. As confirmed by Tapfuma and Hoskins (2019), utilization of institutional repositories in Zimbabwe’s public universities affected how they scored in end of semester examinations. The results are indicated in Table 4.26.

Table 4.26

ANOVA for Online Institutional Repository and Academic Performance

Model		Sum of Squares	Df	Mean Square	F	Sig.
Online institutional repository	Regression	212.915	1	212.92	.988	.000 ^b
	Residual	989.073	82	12.062		
	Total	1000.988	83			

a. Dependent Variable: Academic performance

b. Predictors: (Constant), online institutional repository

4.11.3 Regression coefficients for online past examination papers and academic performance

The study analyzed regression coefficients for online past examination papers and academic performance as indicated on Table 4.27.

Table 4.27

Regression Coefficients for Online Institutional Repository and Academic Performance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
_____ (Constant)	17.279	5.278		3.274	.002

Online institutional repositories	.185	.187	.109	.994	.323
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a. Dependent Variable: Academic performance

The outcome on Table 4.27 established that at insignificant constant value of 17.279, $p < 0.002$, online institutional repositories was 0.185 at $p < 0.323$. Shanmugam (2011) gave a positive feedback on the usage of e-resources at Dr T.P.M. Library, Madurai Kamaraj University. This was translated to higher quality of research performance.

4.12 Multiple regression analysis for the overall model

Linear regression was done to investigate the relationship between utilization of online electronic resources and academic performance of Information Technology undergraduate students of JKUAT, Eldoret campus. The researcher first conducted bivariate regression to test each hypothesis. This section presented the model summary and analysis of variance.

4.12.1 Model summary for utilization of online electronic resources and academic performance

In measuring the influence of utilization of online electronic resources (e-books, e-journals, online past examination papers and online institutional repository) on academic performance of IT students at JKUAT, the study developed a model summary. Table 4.14 indicates that online electronic resources had an R value of .745. Table 4.28 gives the results.

Table 4.28

Model Summary for Online Electronic Resources and Academic Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.745 ^a	.554	.532	2.37621	2.484

a. Predictors: (Constant), e-books, e-journals, online past papers, online institutional repository

b. Dependent variable: Academic performance

The P value of constant value on table 4.28 was insignificant; hence, adjusted R square value was used. The adjusted R square value of 0.532 implied that online electronic resources predicted 53.2 % of the variability in the academic performance.

4.12.2 ANOVA for utilization of online electronic resources and academic performance

The combined ANOVA for the relationship between utilization of online electronic resources and academic performance indicated that the significance value was 0.00 which was less than 0.05. The researcher, hence, established that there was a significant relationship between utilization of online electronic resources and academic performance. As such, utilization of online electronic resources was a key element towards the determination of academic performance. It is noted on Table 4.29, that there was one outlier in the data which was evidenced by the Df being 83 responses instead of the original 84 responses.

Table 4.29

ANOVA for Online Electronic Resources and Academic Performance

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	554.926	4	138.732	24.570	.000 ^b
Residual	446.062	79	5.646		
Total	1000.988	83			

- a. Dependent Variable: Academic performance
 a. Predictors: (Constant), e-books, e-journals, online past papers, online institutional repository

The one outlier in the data which was removed and the values adjusted as indicated on Table 4.30 indicated the findings.

Table 4.30

Adjusted ANOVA for Online Electronic Resources and Academic Performance

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	548.319	4	137.7080	24.278	.000 ^b
Residual	440.752	79	5.579		
Total	989.071	83			

- a. Dependent Variable: Academic performance
 b. Predictors: (Constant), e-books, e-journals, online past papers, online institutional repository

4.12.3 Regression coefficients for online electronic resources and academic performance

The study analyzed the regression coefficients for online electronic resources and academic performance as indicated on Table 4.31.

Table 4.31

Regression Coefficients for Online Electronic Resources and Academic Performance

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.666	4.463		.589	.552

Online past examination papers	.498	.156	.681	3.157	.012
E-books	.169	.074	.182	2.275	.000
E-journals	.252	.130	.148	1.911	.007
Online institutional repository	-.138	.168	-.017	-.083	.000

a. Dependent Variable: Academic performance

The values on regression coefficient in Table 4.32 gives estimations of four factors: online past examination papers $\beta = 0.681$ at $p < 0.012$; E-books $\beta = 0.182$ at $p < 0.000$; E-journals $\beta = 0.148$ at $p < 0.007$; online institutional repository $\beta = -.017$ at $p < 0.000$. The study used Standardized Coefficients beta scores because the constant value in Table 4.32 was insignificant. The multi-regression model that was being used in this examination was scholarly performance = $C + \beta_1B + \beta_2J + \beta_3E + \beta_4R + e$. At the point when the estimations of the unstandardized coefficients were included: academic performance = $2.666 + 0.182B + 0.148J + 0.681E - .017R + e$. This is the place where 2.666 is constant; (B) is e-books; (J) is e-journals; (E) is online past examination papers; R is online institutional repository. The investigation finding suggested that an expansion of one unit of B, J, E, R increases or diminishes Y by $0.182 + 0.148 + 0.681 - .017$. This implied that in multiple regression analysis, online past examinations papers significantly affected academic performance. Tlakula and Fombad (2017), while investigating university of Venda South Africa, agreed that undergraduate students were more concerned, and utilized online past examination papers and e-journals more as compared to other types of online resources.

4.13 Chapter summary

Throughout this chapter, the analysis results were given based on the four key independent variables and the dependent variable. Various diagnostic results were done at the

commencement of the chapter followed by descriptive results. Model summary, analysis of variance, regression coefficients of each variable were given. Later on, the combined model summary, analysis of variance, regression coefficients of all the independent variables combined in relation to the dependent variable was given. Consequently, the general model of the study was equated with the values generated in the analysis.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of the findings, conclusions arrive at, recommendations and recommendations for further research. The study aimed at investigating the relationship between utilization of online electronic resources and academic performance of Information Technology undergraduate students of Jomo Kenyatta University of Agriculture and Technology- Eldoret Campus. The objectives of the study were: to assess the influence of utilization of e-books on academic performance of IT students at Jomo Kenyatta university; to examine the influence of utilization of e-journals on academic performance of IT students at Jomo Kenyatta university; to determine the influence of utilization of online past examination papers on academic performance of IT students at Jomo Kenyatta university; and to measure the influence of utilization of online institutional repository on academic performance of IT students at Jomo Kenyatta university. Expectation Confirmation Theory was adopted in this study. Descriptive survey research design was used in the study. Respondents were the undergraduate students in the department of Information Technology, and librarians in Jomo Kenyatta University of Agriculture and Technology- Eldoret Campus.

Data collection was collected from JKUAT IT undergraduate students using closed-ended questionnaires; and JKUAT librarians using interview schedule. Descriptive statistics, namely; mean, percentage, frequencies and standard deviation were used. Linear and

multiple regression analysis were used to test the hypothesis. The results were presented in tables and explanations given.

5.2 Summary of the major findings

This part introduced a framework of the basic disclosures of the examination subject to the four targets that the examiner attempted to accomplish. As a rule, the revelations of the examination revealed that there was a strong relationship between utilization of online electronic resources and academic performance of IT undergraduate students of JKUAT, Eldoret campus.

5.2.1 Summary findings on e-books

Objective one was to assess the influence of utilization of e-books on academic performance of IT students at JKUAT. The variable had some elements such as electronic publication (EPB), mobi pocket (MOBI), AZW3 e-book, I-book (IBA) and portable document format (PDF). E-books statements had an average mean of 2.88 and standard deviation of 1.21. The first hypothesis indicated that the utilization of e-books had no relationship with academic performance of the Information Technology undergraduate students of JKUAT. Table 4.14 indicated that e-books had an R value of .312. The P value of constant is significant (.000), hence R square value was used. The R square value of 0.397 implied that e-books predicted 39.7% of the variability in the academic performance. It had a beta of 0.172 at $p < 0.000$. On the interview findings, JKUAT Eldoret campus had an average of 250 e-books per month in the first semester and 350 per month in the second semester in 2019. The e-resources policy covers were anchored on electronic format, connectivity and downloadable content. That notwithstanding, the challenges such as slow

internet, power interruptions, limited retrieval skills, slow-computers, limited retrieval skills and slow-computers faced librarians as they issued e-books.

5.2.2 Summary findings on e-journals

In knowing the influence of utilization of e-journals on academic performance of IT students at JKUAT, Eldoret Campus, e-journal statements had an average mean of 4.02 and standard deviation of 0.8. The second hypothesis indicated that utilization of e-journals had no relationship with academic performance of the Information Technology undergraduate students at JKUAT. Table 4.14 indicated that e-books had an R value of .652. The P value of constant was significant (.000), hence R square value was used. The R square value of 0.626 implied that e-books predicted 62.6% of the variability in the academic performance. It had a beta of 0.255 at $p < 0.007$. It was established through interview responses that the average download rate was 300 e-journals per month in the first semester and 400 e-journals per month in the second semester in 2019/2020. The proportion of the library budget spent on e-resources functions was 20 percent. Despite that, the challenges such as low skills, low subscription and low internet affected smooth running of e-journals issuance.

5.2.3 Summary findings on online past examination papers

In determining the influence of utilization of online past examination papers on academic performance of IT students at JKUAT, Eldoret Campus, the study had an average mean of 4.7, and standard deviation of 0.58. The third hypothesis indicated that the utilization of online past examination papers had no relationship with academic performance of Information Technology undergraduate students of JKUAT. Table 4.14 indicated that online past examination papers had an R value of .715. The P value of constant is

significant (.000), hence R square value was used. The R square value of 0.711 implied that online past examination papers predicted 71.1% of the variability in the academic performance. It had a beta value of 0.504 at $p < 0.012$. The interview feedback indicated that the average download rate was 700 online examination papers in the first semester and 900 papers in the second semester in 2019. To sustain e-operations at the library, there were two different servers; one was dedicated to serve the physical library, while the other was meant for online library accessed remotely. The challenges facing online past examination papers included missing papers, internet and power interruption.

5.2.4 Summary findings on online institutional repository

In measuring the influence of utilization of online institutional repository on academic performance of IT students at JKUAT, Eldoret Campus, the study had an average mean of 2.75 and a standard deviation of 1.26. The fourth hypothesis indicated that utilization of online institutional repository had no relationship with academic performance of the Information Technology undergraduate students at JKUAT. Table 4.14 indicated that e-books had an R value of .109. The P value of constant is significant (.000), hence R square value was used. The R square value of 0.212 implied that e-books predicted 21.2 % of the variability in the academic performance. It had a beta value of - 0.014 at $p < 0.000$. The interview findings showed that the average download rate stated was 400 documents in the first semester and 500 in the second semester. Online institutional repository had its share of challenges, such as broken URL links, lack of current records, limited content, and internet connectivity.

On academic performance, after undergraduate students were trained on e-resources the variance within groups was smaller than the variance between groups, hence, the F-test had

a higher F-value of 1.623. This proved that there was a higher likelihood that the difference observed in academic performance was higher in second semester as compared to the first semester.

In the overall model, when the estimations of the unstandardized coefficients were included: $\text{academic performance} = 2.666 + 0.182B + 0.148J + 0.681E - 0.017R + e$; where 2.666 is constant; (B) is e-books; (J) is e-journals; (E) is online past examination papers; R is online institutional repository.

5.3 Conclusion of the study

The study found out that there was a statistically significant relationship between utilization of online electronic resources and academic performance of undergraduate IT students of JKUAT. Further, the researcher established that academic performance was significantly influenced by online past examination papers, e-journals, e-books and finally by online institutional repository.

There was a positive relationship between e-books and academic performance. According to the data collected, availability of different e-books that could be stored in phones, tablets and computers had enabled the students to acquire relevant, fast and convenient knowledge required completion of their assignments; in preparation for examinations; and in doing research within or outside of campus. This, in turn, improved their academic performance improved. However, it could thus be proved that JKUAT Eldoret campus internet connectivity was slow and not efficient, high power interruptions, limited retrieval skills, slow-computers. Apart from that, indicators of expectation to utilize e-books by students was seen to be inhibited by absence of information, negative perspectives; and insufficient and constrained foundation. In this way, higher use of e-books in academic libraries were

seen when there was satisfactory substance and administration quality; information and access to the innovation; accessibility of the essential computers; ease of convenience; and student's very own attributes, such as, education level.

There was a positive relationship between e-journals and academic performance. E-journals gave students a wide range of citations and references for their assignments and group discussion tasks. In addition, they sharpened their research skills and enhanced acquisition of new knowledge that boosted their academic performance. From the results, it was evident that students' level of awareness of the e-journals services offered at the university was high. The students had good basic computer and internet skills; however, they lacked more advanced skills, and this negatively affected their use of e-journal resources. The students used the internet for various purposes, including to study and do research but there was a major problem with accessing e-journals by undergraduate students at JKUAT Eldoret campus.

There was a positive relationship between online past examination papers and academic performance. The study established that when undergraduate students accessed online past examination papers, they were able to develop their confidence when doing their exams, resulting in improved performance.

There was a negative relationship between online institutional repositories and academic performance of IT undergraduate students of JKUAT, Eldoret Campus. In as much as respondents agreed that online institutional repositories enhanced their interest on various thought-provoking research areas, they were not able to contribute to performance since institutional repository did not develop their interpretation skills required during exams and

research. Therefore, online institutional repositories had a weak influence on student's ability to improve their academic performances. Online past papers have boosted student's confidence and enabled them to be well versed with examination questions. However, an issue such as poor computer accessibility has become a limitation, thereby demotivating students to pursue their quench for past examination papers. Apart from that broken URL links, lack of current records, limited content and internet clearly indicated that the content quality in online past examination papers was low

On academic performance results that were gotten showed that before training was done, there was a higher likelihood that the difference observed in academic performance was higher in second semester as compared to the first semester.

The findings indicated that an expansion of one's unit of e-books, e-journals, online past examination papers and online institutional repository increased academic performance by $2.666 + 0.182B + 0.148J + 0.681E - 0.017R + e$. The overall model in multiple regression analysis indicated that when electronic resources were combined together only online past examinations papers significantly affected academic performance.

5.4 Recommendation of the study

The study recommended that more policies should be developed whereby students were able to access diverse examinations papers not only from JKUAT online library, but also government examination bodies such as Kenya National Examination Council (KNEC). This would enhance students' and familiarize themselves with areas of examination. The findings of this study indicated that in spite of the university's effort to provide e-resources, there is low usage of the same. Hence, universities should promote mindfulness crusades on the accessibility of these amenities and the advantages that students may get from their

utilization. This ought to be done to ensure that all the partners know about the presence of e-resources in their institutions.

The study recommended that JKUAT library should increase the number of e-journal articles for the students to access, since they significantly determine their academic performance. JKUAT should ensure that students are able to easily access these e-journals through the library website whenever they wish. Inability to access significant e-resources in areas of study was likewise referred to in this study as an obstruction to the usage of e-resources. Therefore, the university should increase the range of e-journals by buying those journals that are excluded from the ZULC list, for example, American Psychological Association (APA), and Institute of Electrical and Electronics Engineers (IEEE) diaries, so as to provide content for particular regions in the Social and Natural Sciences. Organizations such as Longman Ltd can likewise be requested to give neighborhood content which is not promptly accessible in international journals.

The study recommended that JKUAT library department should improve not only on the quantity of e-books but also the relevance of e-books. Policies for periodic training should be formulated and implemented by library staff who would guide students on how they access, retrieve and store e-resources in their electronic gadgets for future references.

The study recommended that awareness should be created among students by the JKUAT marketing department on the relevance of online institutional repositories. To do this, the library staff should be able to link institutional repositories with academic development of students. Students need to practice on how to adopt the repositories to boost their academic performance. Low internet availability and low data transfer capacities are impediments to

e-resources use as referred to by undergraduate students. University libraries ought to guarantee fitting transfer speed bundles. Additionally, there is need to build the quantity of both physical and remote internet passageways in the university and in the students' halls of residence since information costs were referred to as a contributory factor of poor usage.

JKUAT examination department should also ensure they maximize on online past examinations resources and increase them since they have been discovered to play a significant role towards improving academic performance. Notably, all e-resources offered by the library are accessible inside the university. This implies that students who do not reside within the university cannot access these resources. The college should therefore consider making a Virtual Private Network (VPN) interface so as to empower students to approach the e-resources from outside the university

The study recommends that policies and practices of complete collection should be formulated by the JKUAT university management to help the library in the selection and acquisition decisions, so that it can achieve a balanced collection among electronic resources. This will ensure that there shall be a considerable number of e-books, e-journals, online past examination papers and online institutional repositories. Some e-resources, such as online past examination papers and online institutional repositories, available on the university's website are hard to access. Whenever one tries to access these resources, they are often redirected to a window that requires them to subscribe in order to access the resources. Such cases normally lead to resentment and distrust of the library services among students. It is recommended that the library department undertakes a comprehensive analysis of the resources it offers and take down dead links. Further, there should be

policies to ensure that dead links are always monitored to avoid poor accessibility of e-resources by students.

On the basis that academic performance of IT students had improved significantly due to the training done on e-resources, the study recommends for more trainings to be organized in future to facilitate more knowledge on how to access e-resources at JKUAT- Eldoret campus.

5.5 Recommendations for further research

This is because not all library resources were covered in this study. The study recommends that further studies should be done on other library e-resources such as electronic dictionaries, e-encyclopedias, referencing resources, and official publications, to ascertain their influence on academic performance of students. In addition, future studies can also look into the influence of university policies and administration on utilization of e-resources by students. This is because the respondents disagreed, at a mean of 3.36, that when doing academic research, students were able to access electronic journals through the library which greatly improved the quality of the research. These findings indicated that there was a major problem with accessing e-journals by undergraduate students at JKUAT Eldoret campus.

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APPENDICES

Appendix I: Authorization letter

Chelulei Kennedy Kipkosgei
P.o Box 1947-3100, Eldoret
Telephone: +254 724249837
Email: kkipkosgei@jkuat.ac.ke

To the Director
Jomo Kenyatta University of Agriculture and Technology- Eldoret campus
Eldoret- Kenya.

RE: REQUEST TO CONDUCT A STUDY IN YOUR INSTITUTION

I am a student undertaking Master of Information Science at Kenya Methodist University (KeMU). As part of my studies, I am conducting a study on the topic: Relationship between utilization of online electronic resources and academic performance of undergraduate information technology students of Jomo Kenyatta University of Agriculture and Technology. I would like to request for your authorization to issue questionnaires and conduct interviews to IT undergraduate students and librarians respectively as part of gathering relevant data for this study. The attached questionnaires and interview guide are attached with this letter.

Your responses will be treated with utmost confidentiality and will be used solely for the academic purpose of this study. Your assistance will be highly appreciated.

Yours faithfully,

Chelulei Kennedy Kipkosgei
Student Reg No: ISK-3-1944-3/2017
Telephone: +254 724249837

Appendix II: Introduction letter

Dear respondent,

I am a student undertaking Master of Information Science at Kenya Methodist University (KeMU). I am conducting the study on the relationship between utilization of online electronic resources and academic performance of undergraduate information technology students of Jomo Kenyatta University of Agriculture and Technology. To achieve this, you have been invited to participate in this academic research. The information obtained will be used for academic purposes only and will remain confidential. The results obtained from the survey will be presented in summary form and will not disclose any individual's information.

Thank you for your participation

Chelulei Kennedy Kipkosgei
Student Reg No: ISK-3-1944-3/2017
Telephone: +254 724249837

Appendix III: Questionnaire for undergraduate students in the department of IT

Instructions

1. Kindly tick as appropriate in the boxes of each question using a tick (√) or cross mark (x).
2. Do not write your name on the questionnaire.
3. Answer all questions to the best of your ability.

Section A: Demographic information

a) What is your gender?

(a) Male [...]

(b) Female [...]

b) Which year are you currently in your studies?

i. First year [...]

ii. Second year [...]

iii. Third year [...]

iv. Fourth year [...]

Section B: Influence of utilization of e-books on academic performance

This section has statements regarding the influence of e-books on academic performance. Kindly respond with the response that matches your opinion. Please tick as appropriate in the boxes.

No	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	Availability of different e-books that can be stored in phones, tablets and computers have enabled the student to acquire relevant,					

	fast and convenient knowledge required to do their assignments within or out of campus.					
2.	Quality training offered by the library staff has factored in towards accessing various types of e-books especially which have passwords for privacy.					
3.	There are plenty of e-books access computer devices that can accommodate a huge number of students in the campus					
4.	Efficient internet connectivity has greatly reduced the time required to download different chapters of electronic books through our phones, tablets and computers					
5.	We are able to download e-books that have videos, sounds and images through the online JKUAT library.					
6.	E-books gives students relevant revision content for our examinations					

Section C: Influence of utilization of e-journals on academic performance

This section has statements regarding the influence of utilization of e-journals on academic performance. Kindly respond with the response that matches your opinion. Please tick as appropriate in the boxes.

No	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5

1.	When doing academic research, students are able to access electronic journals through the library which has greatly improved the quality of the research.					
2.	Availability of various non-academic electronic journals such as general public journals have enabled us develop our critiquing skills that are needed especially in group discussion					
3.	When students are doing assignments especially related to IT development structures in various industries, they consult a lot on industry e-journals have enabled them know the developments made.					
4.	Students rely a lot on published academic journals available online to learn and practice how to code based on how other people have done.					
5.	E- journals has enabled students have relevant information on different types citations and references which are used when citing our assignments, group discussion.					
6.	Students have been able to plan and express logical arguments when responding to exam questions due to reading various e-journals					

Section D: Influence of utilization of online past examination papers on academic performance

This section has statements regarding the influence of utilization of online past examination papers. Kindly respond with the response that matches your opinion. Please tick as appropriate in the boxes.

No	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	Availability of school online based past examination papers have enabled a student revise better for their examinations					
2.	Students get group discussion content by accessing problem-based electronic papers					
3.	Students have developed their answering techniques of exams after they learnt how various essay online papers were being answered.					
4.	The imagination level of students has been expanded resulting to high course completion rates after they listened to various audio online examinations.					
5.	Previous online essays have enabled students pass well in their continuous assessment test due to various sharpened skills of interpreting the questions.					
6.	Confidence level of the students have been improved during examinations due to adequate revision of various online past papers					

Section E: Influence of utilization of online institutional repository on academic performance

This section has statements regarding the influence of utilization of online institutional repository on academic performance. Kindly respond with the response that matches your opinion. Please tick as appropriate in the boxes.

No	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	Course notes availability online has boosted student's morale to grasp concepts hence high grades earned in the exams					
2.	Various e-thesis have given students insights on understanding the institutional format for writing their projects hence less time is wasted on writing quality research					
3.	Students have been able to develop their interpretation skills required during exams when they access various reports online.					
4.	There has been positive group cohesion and improved grades when students were able to discuss online course notes provided by the institutional.					

5.	The cost effectiveness due to reduction of printing costs on notes and research studies has greatly reduced cost of learning and motivated students to pay their school fees in full thereby graduating.					
6.	E-thesis have boosted the morale of students to get interested on various though provoking research areas that require attention around them hence able to contribute in various fields.					

Section E: Academic performance of IT students at Jomo Kenyatta university

This section has statements regarding academic performance of IT students at Jomo Kenyatta university. Kindly respond with the response that matches your opinion. Please tick as appropriate in the boxes.

No	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	Utilization of e-books have improved the academic performance of IT students at Jomo Kenyatta university					
2.	Utilization of e-journals have improved academic performance of IT students at Jomo Kenyatta university					
3.	Utilization of online past examination papers has improved academic performance of IT students at Jomo Kenyatta university					
4.	Utilization of online institutional repository has improved academic					

	performance of IT students at Jomo Kenyatta university					
5.	Availability of E-newspapers has updated students on current trends which has improved academic performance of IT students at Jomo Kenyatta university					
6.	Efficient posting of e-results on time has motivated students to work hard and complete their courses without complications of missing marks					

7. What was your average semester grade in the first semester in 2019?

- i. Above 70 (GPA 4.0) [...]
- ii. 60-69 (GPA 3.0) [...]
- iii. 50-59 (GPA 2.5) [...]
- iv. 40-49 (GPA 2.0) [...]
- v. Below 40 (GPA 1) [...]

8. What was your average semester grade in the second semester in 2019?

- i. Above 70 (GPA 4.0) [...]
- ii. 60-69 (GPA 3.0) [...]
- iii. 50-59 (GPA 2.5) [...]
- iv. 40-49 (GPA 2.0) [...]
- v. Below 40 (GPA 1) [...]

Appendix IV: Interview guides for E-resources Librarians

Instructions

1. Do not write the respondent's name on the interview guide

Section A: Demographic information

- a) How long have you been a librarian?
 - i. 1 year and below [...]
 - ii. 2-5 years [...]
 - iii. 6-9 [...]
 - iv. 10 and above years [...]

SECTION B:

Influence of utilization of e-resources by IT students at	Average download rate for 1st Semester 2019	Average download rate for 2nd Semester 2019	Various types	Challenges encountered
• Utilization of e-books				
• Utilization of e-journals				
• Utilization of online past examination				
• Utilization of online institutional repository				

Appendix V: Interview guide for Head of Library

1. How long have you been the head of the library?

v. I year and below [...]

vi. 2-5 years [...]

vii. 6-9 [...]

viii. 10 and above years [...]

2. What does e-resources policy cover in terms of guiding what e-resources users such as students should conform to?

3. What proportion of the library budget is spent on e-resources functions?

4. What are the measures taken to ensure that bandwidth of the library serves JKUAT Eldoret library students better as compared to other libraries?

5. How can you distinguish a competent library staff from how they run their responsibilities?

6. How equipped are the library staff to ensure that they respond to queries related to e-resources in the university library?

Appendix VI: Introduction Letter from Kemu



KENYA METHODIST UNIVERSITY

P. O. Box 267 Meru - 60200, Kenya
Tel: 254-064-30301/31229/30367/31171

Fax: 254-64-30162
Email: info@kemu.ac.ke

July 7, 2020

Commission Secretary,
National Commission for Science, Technology and Innovations,
P.O. Box 30623-00100,
NAIROBI.

Dear sir/ Madam,

RE: CHELULEI KENNEDY (ISK-3-1944-3/2017)

This is to confirm that the above named is a bona fide student of Kenya Methodist University, Department of Information Science undertaking a Degree of Masters of Information Science. He is conducting research on, 'Relationship between utilization of online electronic resources and academic performance of undergraduate Information Technology students of Jomo Kenyatta University of Agriculture and Technology'.

We confirm that his Research proposal has been defended and approved by the University.

In this regard, we are requesting your office to issue a permit to enable him collect data for his research.

Any assistance accorded to him will be appreciated.

Thank you



Dr. John Muchiri, PHD.
Director Postgraduate Studies

Appendix VII: Nacosti- Research Permit

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 737914	Date of Issue: 15/July/2020
RESEARCH LICENSE	
	
<p>This is to Certify that Mr. CHELULEI KENNEDY KIPKOSGEI of Kenya Methodist University, has been licensed to conduct research in Uasin-Gishu on the topic: RELATIONSHIP BETWEEN UTILIZATION OF ONLINE ELECTRONIC RESOURCES AND ACADEMIC PERFORMANCE OF UNDERGRADUATE INFORMATION TECHNOLOGY STUDENTS OF JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY for the period ending : 15/July/2021.</p>	
License No: NACOSTI/19/5703	
737914 Applicant Identification Number	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
	Verification QR Code
	
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Appendix VIII: JKUAT- Eldoret campus approval letter

