INFLUENCE OF ICT INTEGRATION ON ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN KENYA. A CASE OF MAKUENI COUNTY.

BY

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DECLARATION

This research project proposal is my original work and has not been presented for academic award in any other university.

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DEDICATION

This research project report is dedicated to my wife Susan Wangui for moral and financial support in the course of my studies. To my sons Lewis and Gabriel, my loving daughter Mercy for their understanding and tolerance during my studies and to my able supervisor Mr Mumo Mueke for his visionary guidance during the period of my research.

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ABBREVIATIONS AND ACRONYMS

ICT - Information Communication Technology.

IP - Internet Protocol.

KIE – Kenya Institute of Education.

MDG - Millennium Development Goals.

MOEST – Ministry of Education, Science and Technology.

TAM -Theory of Acceptance Model.

TCP -Transmission Control Protocol.

PEOU – Perceived Ease-Of-Use.

PU – Perceived Usefulness.

UTAUT-Unified Theory of Acceptance and Use of Technology.

TPACK-Theory of Technological Pedagogical Content Knowledge.

ABSTRACT

This research study was centered on finding out the influence of ICT integration on academic performance of secondary schools in Kenya; A case study of Makueni County. The study was based on the following research objectives.To examine how ICT integration in administration management influences academic performance of public secondary schools in Makueni County.To assess how the use of ICT integration in teaching influences the academic performance in public secondary schools in Makueni County.To establish how ICT integration in examination management influences the academic performance in public secondary schools in Makueni County. To establish how e- learning influences the academic performance in public secondary schools in Makueni County. The study adopted a descriptive research design in collecting data from the respondents. The target population was comprised of an aggregate of individuals with similar characteristics and with respect to a particular area of the study. This target population was therefore constituted of all public secondary schools in Makueni county totaling 379.The teachers were 3158. The data collection instrument for the research study was questionnaires. The research study used descriptive data analysis method. This was because the designed used was descriptive. Data was analyzed quantitatively using the statistical package for social scientist (SPSS).Quantitative data was analyzed using descriptive statistics calculated as proportions, frequency and percentages. Pearson correlation coefficient was used to determine the relationship between the study variables. Data was then presented in a tabular summarized form. The study revealed that there was a strong, positive and significant correlation between ICT and its Integration in School Administration and academic performance of public secondary schools ($r = 0.806$, p value=0. 029),ICT Integration in Teaching and academic performance of public secondary schools ($r=0.603$, p value=0.016),ICT Integration in Examination Management and academic performance of public secondary school ($r=0.606$, p value=0.028) and e-Learning and academic performance of public secondary schools($r=0.881$, p value=0.006). The study concluded that ICT integration in administration positively and significantly influences academic performance of public secondary schools in Makueni County. Computers, photocopiers were highly available and ICT is used to some extent in preparation and maintenance of staff meetings records, accounting, maintenance of teachers' performance records, personnel management records and student's admission records.Also ICT integration in teaching positively and significantly influences the academic performance in public secondary schools in Makueni County.ICT improved the presentation of material in lessons, enhanced understanding during lesson presentation,made teaching more interesting for learners,positively changed the relationship between the students and gave them confidence when teaching.ICT also made preparation of lessons to be easy and faster.In examination management and e-learning ICT influenced the academic performance in public secondary schools in Makueni County significantly. The study recommended that secondary schools should invest more in computers and related technology as means of not only solving accessibility problem but improving on the presence of the facilities especially computers in the classroom and computer lab. More infrastructures: printers, computers, projectors should be put in place for more practice and utilization.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In twenty first century world, globalization has changed our lives and one of the ways in which it has changed is how we communicate. According to Buabeng-Andoh and Issifu (2014), Countries around the world have realized the opportunities rising information age portrayed by information and communication technologies (ICTs). These advancements are driving national improvement endeavors all around and various developed and developing countries are investigating methods for encouraging their improvement procedure through the advancement, arrangement and the exploitation of ICTs inside their economies and social orders. This has been required by the quick headways in information and Communication Technologies (ICT). As per Pelgrum and Law (2003), the issue of PCs in education began to end up prominent in education policy making in the mid-1980s when generally cheap microcomputers wound up accessible for the consumer market. The progress of the information economy and worldwide financial rivalry constrained governments everywhere throughout the world to organize instructive quality, long lasting learning and the arrangement of instructive open doors for all. Wallet (2014) watched that strategy producers generally acknowledge that entrance to data and correspondence innovation (ICT) in instruction can assist people with competing in a worldwide economy by making a talented work constrain and encouraging social versatility. They underscore that ICT in instruction has a multiplier impact all through the training framework, by upgrading learning and giving understudies new arrangements of abilities; by achieving understudies with poor or no entrance (particularly those in country and remote districts); by encouraging and enhancing the preparation of instructors; and by limiting expenses related with the conveyance of conventional guideline .Globally the constraints of separation have been broken completely. Instructors in created nations can educate a few understudies everywhere throughout the world in the meantime through virtual classrooms.

ICT integration in secondary schools in Africa is a rare experience in educational system in most schools. In developing countries, particularly sub-Saharan Africa, the quality of education is negatively affected by political and ethnic conflicts, HIV/Aids and also low economic growth rates due to high levels of debt in such countries. This has slowed down the development of

education in such countries forcing the schools to rely on basic instructional tools e.g. backboard and chalk. This affected education growth negatively. Due to this, many developing countries in Africa have started embracing technology which can potentially be an important agent of development. This is because, the effect of ICT in developed countries has been positively noted to have improved their rapid development and therefore necessary for future development of many African countries. Buabeng-Andoh and Issifu (2014) further noted that as part of the Government of Ghana's commitment to a comprehensive programme of rapid deployment, utilization and exploitation of ICTs within educational sector and other sectors in the country, a National ICT Policy and Plan Development Committee was set up in 2002 to formulate ICT policy referred to as Information and Communication Technology for Accelerated Development.
In Kenya the use of ICT in schools in schools is urgent for the advancement of financial and social charge around the world. As indicated by Tedla (2012), Several studies about show that Information and communication technology (ICT) gives educational openings and ecological readiness for classroom guideline.

All the more basically, ICT assumes a more prominent part in creating of learning and preparing data for critical thinking and further investigation..For many years up to and including 2000, Kenya did not have a policy on integration of ICT in schools. The national policy on ICT was adopted in 2006 after several years of effort, in trying to put it in place. The policy aims was to improve the livelihood of Kenya by ensuring the availability of affordable, efficient, reliable and accessible ICT services as reported in education options paper (MOEST 2005). In the IT section the objectives regarding the use of ICT in schools colleges, universities were well stated. E-Learning as one of the strategy outlined in this report was very significant. Digitization of the curriculum had been ongoing in order to achieve the ICT integration. The other strategies outlined in the same report i.e. the national information & communication technology included, to advance the improvement of e-learning resources, to encourage public-private organization to assemble resources keeping in mind the end goal to help e-learning activities, advance the advancement of a coordinated e-learning educational programs to help ICT in instruction, advance separation training and virtual foundations especially in advanced education and preparing, advance the foundation of a national ICT Center of magnificence, give reasonable framework to encourage spread of information and aptitudes through e-learning stages, advance

the advancement of substance to address the instructive needs of essential, auxiliary and tertiary establishments, make consciousness of the open doors offered by ICT as an instructive apparatus to the training area, encourage sharing of e-learning assets between foundations, exploit e-learning chances to offer Kenya training software engineers for send out, incorporate e-learning assets with others existing assets.

Kenya Institute of Education (KIE) was ordered to build up the ICT educational modules and in addition to disseminate the instructive material.

According to Farrell (2007), the challenges faced by most secondary school as indicated in the ministry's policy framework were, limited rural electrification, high level poverty, frequent power disruptions, few sufficient ICT tools for teacher & students and lack of connectivity and network (internet).

Farrell (2007) further noted that the government of Kenya placed considerable emphasis on the importance of ICT in schools. The Ministry of Education had taken steps to support the implementation of the strategy either by direct actions or through the various organizations and agencies it works with. There are also other institutions and organizations that continue to be active in implementing and supporting projects involving ICT in public secondary schools.

1.2 Statement of the Problem

Countries around the world have realized the opportunities of the emerging information age characterized by Information and communication technologies (ICTs). These technologies are driving national development efforts globally and a number of developed and developing nations are exploring ways of facilitating their development process through the development, deployment and the exploitation of ICTs within their economies and societies. According to owino(2013), Numerous underdeveloped nations are leading studies, projects, extends and formulating policies, all aimed at exploiting the ICT potential for social-financial advantages to build up an upper hand.For this to happen, integration of ICT in secondary schools curriculum is of paramount importance since it will help the future work force be able to adopt to the use of technology at an early age. According to Tedla (2012), in many African Countries, particularly in East Africa, most teachers do not integrate ICT into their instruction as it should be.

It is generally believed that ICTs can empower teachers and learners, promote change and foster the development of '21st century skills. It is also true that ICTs can and will empower teachers and learners, transforming teaching and learning processes from being highly teacher-dominated to student-centered, and that this transformation will result in increased learning gains for students, creating and allowing for opportunities for learners to develop their creativity, problem-solving abilities, informational reasoning skills, communication skills, and other higher-order thinking skills. However, there are currently very limited, unequivocally compelling data to support this belief.

Kenya as a country has identified the use of ICT as one of the tools which will help it to realize its vision 2030. According to MDG Report (2008), the government has undertaken the initiative of equipping public primary and secondary schools with ICT resources with the aim of improving academic performances and ICT literacy levels among students.
It has gone further by Ministry of Education launching a national ICT policy to integrate computer in classroom instruction. The Kenya Institute of Curriculum Development (KICD) has also translated the national ICT policy, prepared ICT curriculum and presented it to schools for implementation. All this investments by the government has been done with the aim of improving academic performance of our secondary schools. However, not much success has been realized on this end. According to a study done by Mwunda (2014), he established that the integration of ICT in teaching and learning in secondary schools is still very low in Kenya. Wambaria (2014) revealed that secondary school teachers perceived ICT to be useful but rarely used it in teaching and learning in Machakos Sub County. A study done by Laaria (2013) revealed that despite government's efforts to improve quality of education through ICT adoption. The National ICT policy on education of 2006 has not been effectively implemented.
It is against this backdrop that the researcher sought to investigate the influence of ICT integration on academic performance of secondary school in Kenya.

1.3 The Purpose of the Study

The purpose of the study was to establish the influence of ICT integration on academic performance of public secondary school in Makueni County.

1.4 Objective of the Study.

This study was based on the following research objectives,

1. To examine the extent to which ICT integration in administration influences academic performance of public secondary schools in Makueni County.
2. To assess the extent to which the use of ICT integration in teaching influences the academic performance in public secondary schools in Makueni County.
3. To establish the extent to which ICT integration in examination management influences the academic performance in public secondary schools in Makueni County.
4. To establish the extent to which e- learning influences the academic performance in public secondary schools in Makueni County.

1.5 Research Questions

This study was guided by the following research questions.

1. To what extend does ICT integration in administration management influences academic performance in public secondary schools in Makueni County.
2. To what extend does ICT integration in teaching influences academic performance in public secondary schools in Makueni County.
3. To what extend does ICT integration in examination management influences academic performance in public secondary schools in Makueni County.
4. To what extend does e-learning influences academic performance in public secondary schools in Makueni County.

1.6 Significance of the Study

The research study would be of great significance to the stake holders in the education sector. This is because the study report highlighted and explained the influence of ICT in the education sector which was of important to the governments of Kenya.It could enable the government to come up with measures of alleviating the imbalance of knowledge among school leavers.

Towards achieving the vision 2030 goals in Kenya, this study could provide an insight on the best way forward on investing towards enriching the Kenyan child with the necessary skills and competencies required for survival in our dynamic world.

The study will facilitate the principals of secondary schools to adopt proactive measures that enhance the effectiveness use of information technology equipment's in the institutions that they head.

To the teachers, this study will provide an insight of where their teaching standards fall therefore enabling them to see the need of integrating ICT in their lessons as they teach.

Also, the study will be of significance to students since it will contribute towards equipping many students with more knowledge and skills on the benefits associated with effective use of IT. Future study will find the study material useful in their studies since they will have a ready source of literature review. The study report will act as a reference and stimulate interest among academicians and this will encourage further research about the problem and solutions, thereby facilitating effective application of information technology in education.

1.7 Limitation of the Study

The secondary school head teachers, deputy head teachers, head of departments, examination officers and teachers could give unreliable responses. The researcher included some similar items in the questionnaires for both the head teachers and teachers to compare their responses and identify any disparities. The information gathered on the availability of computers for e-learning in comparison to the number of learners could give a false impression as some computers could be obsolete. The researcher requested to test some computers to verify if they were functional and if e-learning materials were available.

1.8 Delimitation of the Study

The study was delimited to public secondary schools in Makueni County. It, restricted itself to secondary school head teachers, deputy head teachers, head of departments, examination officers and teachers in public secondary schools in Makueni County. While there could be other factors influencing academic performance other than ICT integration, the study restricted itself to investigating influence of ICT integration on academic performance. In particular, the study was delimited to; how ICT integration in administration, teaching, examination management and e-learning, influenced academic performance in public secondary schools in Makueni County.

1.9 Assumptions of the Study

The assumptions for this study was that the head teachers, deputy head teachers, head of departments, examination officers and teachers approached were willing to provide honest and reliable responses. It was also assumed that all head teachers and teachers would have used ICT facilities in teaching. The study also assumed that the secondary school teachers were qualified and competent to integrate ICT in teaching and learning. Further the study also assumed that ICT facilities were available in public secondary schools for use in teaching and learning.

1.10 Definition of Terms

Information and Communication Technology (ICT) - This refers to technologies that provide access to information through telecommunications.

Administration Management -The process or activity of running an organization or an institution.

ICT Integration in Teaching - Use of technological tools and resources to communicate, store and manage information during lesson delivery to enhance understanding.

Examination Management-Organization of data related to setting, moderating and storage of examination data.

Integration - To mix with or join different methodology through use of technology.

Internet - This is the worldwide arrangement of interconnected PC organizes that utilization the web convention (TCP/IP) to connect gadgets around the world, it regularly transmit information by means of different kind of media.

E-learning - This is learning by utilizing electronic technologies to access educational curriculum through computer.

Power Point - this is presentation program developed by Microsoft. The software allows users to create anything from basic slide shows to complex presentation.

Mobile Phones - This is an electronic telecommunications device that connects to a wireless communications network through radio wave or satellite transmissions.

1.11 Organization of the Study

The study was organized into five chapters. Chapter one included background of the study, statement of the problem, purpose of the study ,objectives of the study, research questions,

significance of the study, limitations of the study, delimitations of the study, assumptions of the study and the definition of significant terms . Chapter two consisted of related literature review to the study. Chapter three presented the methodology that was adopted for the study. Chapter four consisted of the findings and discussion of the study. Chapter five presented a summary of the findings, conclusion and stated relevant recommendations for the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature that relates to the research problem outlined in the previous chapter with particular focus on the main variables in the study which addressed could lead to successful integration of ICT in secondary schools. The parameters investigated include, ICT integration in administration management, ICT integration in teaching, ICT integration in Examination management e-learning, conceptual framework of the study that illustrate the relationship between the study variables.

2.2 .ICT Integration in Administration and its Influence on Academic Performance.

ICT integration in administration and management of schools refers to the extent to which it has been adopted into public secondary schools environment and the degree it influence the school's organization and the performance. The usage of ICT in administrative management may involve harnessing technology for better planning, setting standards, effecting change and monitoring results of the core functions of secondary schools.

According to Mutisya (2017), the level of ICT integration is determined by the interplay between the infrastructure, teacher motivation, innovations and development of e-pedagogies. In our world today, ICT has become a vital tool of our day-to-day life and how we do things in our work places. Mangesi (2010) acknowledges that the on-going technology revolution encompasses new ways of capturing, processing, storing and displaying information and is capable of increasing productivity and competitiveness through information provision.

According to Preston and Cox (2000), the importance of ICT is widely recognized both in the workplace and at home.It has also been able to improve world economies. ICT has also been able to contribute greatly to educational management in schools worldwide (Zhao & Frank, 2003).

Egessa and Musiega (2014), indicated that ICT helps in staff management by processing of voluminous records in a quick, meticulous, and impeccable manner easing data retrieval. This always enables management to save time and be effective.

Mingaine (2013), noted that ICT can help in providing a good communication system in providing timely information internal and external users acquisition and dissemination in all institution including schools.

According to Maki (2008), ICT plays a vital role in supporting powerful efficient management and administration in the education sector and it is specified that technology can be used right from student administration to various resource administrations in an educational institution. However, the growth in the ICT application in schools is not even leading to differences in terms of the level of integration and the influence on academic performance of the school. Many countries have invested huge amounts of money in ICT in schools, Kenya included.

According to Ngugi (2012),the ability to connect computers through networks helps principals to work together and share information and thus promote school-community relationship and by extension the academic performance.

Makewa, Role and Nyamboga (2011),noted that integration of ICT into secondary administrative processes enhance overall students' records by making it more accessible to many.This was able to bring in efficiency and good academic performance.

On staff administration, Alexander (2012), indicated that ICT has enabled allocation of work, attendance, and leave management and performance appraisal, raising efficiency in task distribution, data collection and management.

According to Fredriksson and Gajek (2009), ICT plays a key role in the management of complex information flow and integration of such information towards effective policy formulation and planning for the utmost maximization of human capital and potential in the school environment. This is normally very important to enable the school to maximize its potential and thereby achieve its long time goal of enabling the students who pass through the institution to perform very well academically.

A report by World Bank Report (2007), indicated that ICT have made it possible for teachers to maintain accurate student records, track and analyze performance and use the resulting information to make decisions about how to have individualized instructions in order to maximize good learning.

ICT has enabled teachers to keep better records and more importantly, making use of the resulting information. Before changing the way teachers and schools manage classroom and school records, it is important to evaluate the school's information (World Bank, 2007).

According to Saiti and Prokopiadou (2009, the implementation of new technologies in secondary education has rapidly increased and adoption of ICT reinforces the teaching process, and by extension facilitates management transactions.

Ong and Lay (2006) further stated that school principals can embed ICT within teaching, learning, management and planning: develop a vision for the development and integration of ICT across the curriculum and promote this vision within and beyond the school.

According to Kumar, Rose and D'Silva (2008), ICT integration helps to reduce the complexity and enhance the overall management of higher education. Overall ICT can be used for effective educational management such as pay roll, financial accounting, student data, inventories and personnel records.

Makhanu and Kamper (2012), further noted that ICT automation of admission process from enquiry by students, applying for admissions through electronic media, registration and enrolment using computers has improved management initiatives to adequately, handle both students and stakeholder related issues.

Uwadia (2009), acknowledges that ICT serves as a tool for increased productivity and effective decision making. This may ensure teachers effective classroom delivery lessons, effective communication to all stakeholders, effective maintenance of well updated students record system and maintaining academic planning record system that may have appositive impact to academic performance of the students.

2.3 ICT Integration in Teaching and its Influence on Academic Performance.

In out today world, instructional management aims at improving teaching and learning processes through a deliberate emphasis on ways and means of instilling excellence in quality of instruction. According to Roberts and Sikes,(2011), modern teaching require educators to present a more efficient and modern instructional management to equip students with knowledge and skills that stimulate creativity and spur growth.

This why the information and communication technologies (ICTs) have turned out to be somewhat profoundly established in educational settings. Their utilization has encouraged subjective changes in how teaching is drawn closer, particularly as far as displaying substance sound outwardly, where PowerPoint is the frequently utilized device, utilization of web and furthermore utilization of cell phone innovation.

PowerPoint is a software program that has turned into a fundamental methods for conveying introductions in both address lobbies and instructive focuses. Consistently in excess of 30 million introductions are conveyed with PowerPoint, Savoy et al (2009). Over 20 years have slipped by since PowerPoint first showed up, and from that point forward its essence in classrooms has risen extensively. In particular, 90% of teachers at the colleges utilize PowerPoint in their hypothetical classes, and of them, just about half actually translate the substance that is anticipated onscreen. This enormous nearness of PowerPoint in the present instructive culture has provoked a discussion on its utilization and adequacy.

There are as yet couples of exact investigations that assess the viability of PowerPoint innovation. The biggest number of references originates from prescriptive distributions in which they mean to share systems and methodology for successfully utilizing the program and, in doing as such, feature the focal points and burdens of utilizing it (Babb and Ross, 2009; Jones, 2006; Lowry, 2003; Szabo and Hastings, 2000; Vernadakis, Antoniou, Giannousi, Zeton and Kioumourtzoglou, 2011). A second gathering of distributions incorporates supposition articles, which started to show up in American magazines with expansive flows in 2000. Inside this second gathering, Tufte (2003) is noticeable, and his reactions can be condensed in the accompanying five focuses: the too much schematic nature of PowerPoint streamlines or obstructs the multifaceted nature of specific thoughts from being passed on; the aimless utilization of shading, activity and sound block coordinate perception of the substance; PowerPoint is a guide to the speaker yet not to the group of onlookers; because of its low determination, it is a wasteful device for showing tables and charts; and its set-up forces an inflexible, direct perusing request in view of visual cues.

In this way a progression of hypothetical investigations seemed which, not at all like creators like Tufte, trusted that the apparatus was not negative in itself but rather that it had wasteful clients. PowerPoint, much the same as some other arrangement of coding implications, has highlights that influence the creation and gathering of both the final product and the structure of the substance (Farkas, 2006; Stoner, 2007). In this sense, Neville (2004) distinguished three employments of PowerPoint: as a guide for the speaker; as a guide for the audience or peruser; and as a content to exclusively be perused free of oral talk. In the brain of this creator, the main reason that PowerPoint can achieve viably is the second.

In spite of the way that mixed learning is starting to be seen as an attainable answer for the plenty of restrictions in conventional classes, a few investigations demonstrate that online understudies lean toward up close and personal contact with their educator and perform preferred with this model over with mixed learning (Riffell and Sibley,2005). In this setting of vis-à-vis communication amongst educator and understudy, two varieties in the customary instructor focused class must be recognized: to begin with, classes in which the instructor's oral talk is the primary device in passing on a grouping of substance, alongside the time spent on them and the illustrative components. Also is the inexorably across the board technique among instructors rotating around the PC apparatus, PowerPoint, in which an arrangement of substance is characterized in the introduction and the teacher goes about as an analyst of the verbal materials anticipated.

Drawing from psycho-educational hypothesis, Mayer and Moreno (2003) recommend the essential merging of three components with a specific end goal to accomplish an "astute use" of mechanical assets in training: insight, direction and innovation. Inside intellectual hypothesis, the adequacy of sight and sound taking in comes about because of these three inquiries (Veronikas and Shaughnessy, 2005). How do individuals realize, by what method can the realizing knowledge be encouraged, and by what method would technology be able to be utilized to enhance the learning procedure. This last point fills in as the system for the primary objective of this investigation: to assess the viability of PowerPoint during the time spent learning substance.

Past revealing insight into this debate, to the degree conceivable, in this examination we set out to decide if utilizing the PowerPoint philosophy to exhibit verbal substance in an instructor drove

class influences understudy learning. Dissimilar to the examinations performed exceptional, in this investigation we think about the nearness of the PowerPoint philosophy or asset not as a component to supplement the instructive talk yet as the principle component in the introduction of the substance, while the instructor's talk is the thing that fills in as a supplement. In particular, we will watch whether there are contrasts between the assessments of similar substance instructed with or without the nearness of PowerPoint as a methodological asset which is utilized as the principle device in the class session.

Another very important way of integrating ICT in teaching is through the use of internet.

According to Kesarapon .W. (2011),internet use has spread faster due to the development and spread of cheaper and more user-friendly computer technology and software e.g. portable computers, Microsoft Word among many others**.** The use of the Internet has increased dramatically. He further indicated in his report that in 2010, the world's Internet use was 28.7% of the population and that the growth in the use of the Internet had been dramatic. For example, between 2000 and 2010, the rate of growth of Internet use was 444.8%.

Thabet and Kalyankar (2014), argued that the particular attributes of the computer are needed to bring real-life models and simulations to the learner; thus, the medium does influence learning. However, it is not the computer per-se that makes students learn, but the design of the real-life models and simulations, and the students 'interaction with those models and simulations. The computer is merely the vehicle that provides the processing capability and delivers the instruction to learners.

According to research done by Henry .J.B.(1999), hundreds of thousands of teachers have become regular electronic mail users, although that same degree of taken-for-granted access has not yet been provided to many students. He further concluded that, even in its most obvious manifestation as "the world's largest library," teachers find the Internet to be an incredibly useful technology. Moreover, current applications only scratch the surface of the capabilities that the world-wide digital communications infrastructure will eventually provide for teachers and their students.

He proposed that in order to extend Internet use to larger numbers of teachers, it is useful to examine the following conditions, high levels of classroom connectivity; computer expertise;

constructivist pedagogy; participation in staff development; high frequency of informal contacts with other teachers and involvement in professional leadership activities.

According to Wesley A.(2011), Who did a research on high school students academic performance and internet use, he concluded that students that used the Internet at school and at home, which he termed as moderate users, such students enjoyed higher grades versus those that did not use the Internet.

Another very important way of ICT integration in teaching involve the use of mobile technology. Mobile phones and their applications are rapidly growing in importance and can be used for various purposes.

According to Algahtani and Mohammad (2015), mobile-learning is e-learning that uses mobile devices and wireless transmission. M-learning functions by integrating a number of hardware and software technologies into multimedia applications to facilitate the understanding of educational content,

According to Rabiu et al. (2016), mobile phones have become an almost essential part of daily life since their rapid growth in popularity in the late 1990s. A nationwide survey conducted in 2010 shows that mobile phones are the most necessary medium of communication for working class people. It has virtually affected the society's accessibility, security, safety and coordination of business and social activities and has hence become a part of culture of the whole world.

Rabiu et al (2016) further noted that technological advancements, the innovation of computer and other discoveries in the field of information technology bring about the introduction of the mobile phone and its multi functions ranging from voice calls, messaging, data use, multimedia, games (both online and offline) and other social media services.

Cavanaugh (2009) indicated that Internet-connected mobile devices such as netbooks and smart phones can allow students to access online courses while traveling among home, school, work, and athletic events. Online teachers can integrate these aspects of students' lives by building projects around personal experiences. Multitudes of educational possibilities become reality once the boundaries of time and place are removed.

2.4. ICT Integration in Examination Management and its Influence on Academic Performance.

In the world over, the use of ICT has spread in all departments in any modern organization in Kenya as in many other African countries, the government has tried its best to fund this sector to enable Kenya not to be left behind.

A case in point is in the institution of learning e.g. secondary schools. One very important department in an institution is examination. This is normally the nerve of an institution. For it to function very well, it depends on the existence of ICT infrastructure, people's skill and According to Tusubira, (2005), any modern institution of higher learning is critically dependent on the smooth operation of the new innovations of Information and Communication Technology. It is this trend that Kenya as a country has embarked on for the past period. Supported in its entirety by the communication technology, information spread become faster and cheaper. Currently, Kenyan government has introduced the use of ICT where National examination results of individual students are made available on the Web site. Other countries like France make available the results of the examination, school by school, on the Ministry's Web site. These results are presented in adjusted form, corrected for the socioeconomic background of the students in each school (Ziraba .A, 2010).

Recording data electronically, storing it centrally, and sharing it with colleagues are vital to reducing workloads through available ICT structures (Devon, 2004). As outlined above, this would normally has a big impact because in most secondary schools offices, they have ICT facilities and therefore, would have an impact on the management of education institutions; such integration can increases efficiency and accountability to institutional resources. For cases of missing marks or any other data related to exam, if efficient MIS is developed and fully put to utilization, such problems would be eliminated.

Devon (2004) points out that in respect to management of students" affairs; there are various types of information systems that can be available in making informed decisions at all levels and in improving efficiency of operations, such as executive decision making management information system, collaborative information systems, electronic messaging systems,

According to Motovu M,(2005), there has been a growth of computer-aided assessment over recent years. It is widely accepted that Bloom provides a sensible taxonomy of educational objectives that apply to most academic subjects. It has also been observed that Management Information Systems (MISs) affect school management in a way that they effectively lead to school improvement and can assist senior leaders in planning and evaluating the operation of their schools (Fullan, 1992).

Accessibility to ICT facilities such as computer program of Excel ensures accuracy, timeliness and effectiveness of managing the whole process of examination that is; it allows easy flow of information and risk monitoring systems that are appropriate (BECTA, 2000). Bearing in mind the tiresome tasks of setting, marking and computing and grading students in schools especially big numbers of students, with automatic set examinations, there can be easy monitory of students and marking using computational designed systems. Software for managing examinations in School has been developed for use by administrators to play examination roles for administrators, teacher and students.

The use of ICT especially the computer program of Excel manages data and makes it easier for teachers and administrators to maintain accurate records to improve school and classroom management, (Motovu, 2005).

Schools in kenya are under increased pressure to do much work with less manual efforts through the use of ICT. It is thus unfortunate that in the world of ICT-led innovation, assessment usually fails to raise much enthusiasm, (Harding and Raikes, 2002).

It is believed that with the use of ICT, testing and assessment can be more effective. According to Ziraba A,(2010), he observed that computer aided assessment only takes certain form of questions. He further noted that the vast majority of current computer aided assessment systems provide only the following question types: multiple choices, multiple response, numeric answer, text string, which are not applicable because of the many subjects which is requires essay writing offered at secondary school level .

Many ICT based instructional applications provide an objective means of assessment. They can also maintain records of individual progress of each student and can assist teachers in identifying students' weaknesses and in determining measures that can be taken to address such weaknesses, (Mark, 2003).

Modules of management information systems enable electronic transfer of examination entries and results to and from examination boards. Bulk photocopying can be made easier by linking computers to photocopiers or laser printers, enabling staff to produce copies of documents as required .However, most schools are using MISs at a basic, data-entry level, and senior leaders will require training to make more advanced use of these systems. Using ICT-based pupil assessment tracking and attendance systems, and the creation of in-house reporting and recording software, will help to take schools beyond the current basic levels of use (Eremu, 2007)

ICT fosters a positive, close association of students with the assessment of their own learning. Given the potential of these technologies, students' work can easily take other forms than that of written text, or combine various forms, and can be transmitted at any time, virtually in an instant, to examiners in another location (Ziraba, 2010).

The ICT technologies makes possible the dissemination of information over computer networks of the best assessment instruments prepared by teachers and the better work produced by students.

2.4. e-learning and its Influence on the Academic Performance

Lumadi (2013) observe that e-Learning as a modern strategy for teaching and learning is multi-dimensional and dynamic, changing according to context, circumstances and interest. Thus, there are different expressions or typology of e-Learning. He further defines e-Learning as "the systematic use of networked information and communication technology in teaching and learning", then state that e-Learning and online learning are terms that have emerged to describe the application of Information and Communication Technologies (ICTs) to enhance distance education, implement open learning policies, make learning activities more flexible and enable those learning activities to be distributed among many learning venues. Horton (2005) characterized e-learning as the utilization of web and advanced advances to make encounters that teach our kindred people.

As per Fayomi et al. (2015), E-learning has turned into another encapsulation and new fundamental standards in library benefits and instructive division with a mission to fill in as an advancement stage for show day society in view of information. Sibanda (2014) observed that e-learning has become a pillar of success in higher education as it enhances the quality of teaching and learning. A positive relationship exists between the use of learning technology and student engagement and desired learning outcomes .However, high attrition rates emanating from online learning have been of concern to educators worldwide Studies have been conducted on student preference for online learning versus face-to-face learning, albeit without cross-cutting conclusions. Students prefer face-to-face learning to acquire conceptual knowledge in the subject matter, while online learning is preferred in acquiring self-regulated learning skills. Online learning does not only provide students with time and place flexibility, but also with the ability

to apply one's knowledge and "metacognitive self-regulation strategies such as monitoring one's learning progress". However, whether these student preferences ultimately benefit student performance is another matter. Although mixed findings related to student success and the use of online learning platforms have been documented, most scholars show that online learning tools enhance student engagement and lead to them achieving the intended learning outcomes.

Fayomi et al (2015), further noted that-learning has the potential to revolutionize the way we teach and how we learn educational technology visa-avis instructional technology whether as a field of education or new terminology to what has been there before like teaching aids or apparatus, as it was earlier called but recent achievements in the field of computer and communication technologies have offered tremendous opportunities for learning by electronic means. Therefore, the world of technology continued to grow and today the whole world has become a global village. By the beginning of the 21st millennium educational technology has stretched educational boundaries and created new ones on a daily basis. One of these new and rapidly expanding boundaries is e-learning which is offering tremendous advantage to education sector. The introduction of new multimedia technologies and the Internet in teaching-learning relationship has been seen as a means to improve accessibility, efficiency and quality of learning by facilitating access to information resources and services as well as remote exchanges and collaboration. Nonetheless, by the middle of the 20th century the growth in technology and applications even in the field of education has been unavoidable to be overlooked. It has been found that students in higher educational institutions that engaged in E-Learning, generally performed better than those in face-to-face courses. Holley, (2002) found that students who participate in online/ E-Learning achieve better grades than students who studied traditional approach. As result of this finding E-learning is growing very fast and has become popular and that is why many higher educational institutions are adopting to virtual learning system.

E-Learning is widely used in many universities in the world today and Covenant University inclusive. In some universities, their E-learning does not add any value to the teaching and learning activities of the University and perhaps they do not investigate the impact of E-learning on student academic performance. Much research has not been done on the relationship of E learning use and student academic performance. The use of new multimedia technologies and the Internet in learning is seen as a means to improve accessibility, efficiency and quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration.

E-learning has become a new paradigm and philosophy in education with a mission to serve as a development platform for present-day society based on knowledge. It is evident that the concept of e-learning is considered to be very attractive as a new learning model whose effect will be a positive one to the development of education in developing countries especially Kenya, with all its potentialities. Although, not much effort is taken for its implementation, present-day research of e-learning in Kenya shows that having e-learning on the educational agenda still face a lot of challenges.

Fry 2000 and Wild et al. 2002 describe E-learning as the delivery of training and education via networked interactivity and distribution technologies. Other authors notably Roffe, 2002; Schank, 2002; and Sambrook, 2003 see e-learning simply as learning and communication exercises across computers and networks or for that matter any other electronic sources.

Khan (2005) pointed that E-learning has been described in various ways as learning using a number of different technologies and methods for delivery e.g. Computer Based Training (CBT), Internet-based training (IBT), Web-based instruction (WBI), advanced distributed learning(ADL), distributed learning (DL), distance learning, online learning (OL), mobile learning (or m-learning) or remote learning and learning management systems (LMS).

In the 70s and 80s distance learning became popular and was done via mail until the rise of Internet usage. In late 90s the digital learning environment was heightened and World Wide Web started as a distributed learning mechanism to support on campus student and distance learners. With the use of this delivery technology learners can get a range of resources like discussion forums, multimedia, chat, video conferencing and electronic black boards (Gulatee and Combes, 2007).

In E-learning system, students are able to interact anytime from wherever with different instructional material (text, sound, pictures, video and so on) through Internet. In addition, learners can communicate with teachers and classmates both individually and as a group discussion with the use of message boards, instant message exchanges and video conferencing (Al-Ammari et el, 2008).

Khan 2005 suggests that e-learning system is used for an open, flexible, and diverse E-learning environment. Moreover E-learning system can be analyzed as an inventive approach for delivering, learner-centered, interactive, and facilitated learning environment to anyplace, anyone, anytime by utilizing the features and resources of different digital technologies along

with other types of learning materials suited for an open, distributed, and flexible learning environment (Ibid, 2008).

2.6 Theoretical Framework

The research study will be guided by three theories namely

Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Technological Pedagogical Content Knowledge (TPACK) which focus on users of technology.

The researcher identified the three theories, as they will provide information for the research problem and stated objectives of the study.

2.6.1 Theory of Technology Acceptance Model (TAM)

The technology acceptance model (TAM) is an information systems theory that models how users come to accept and use a technology. It was initially proposed by Davis (1989).

It is an information systems theory that models how users come to accept and use a technology. This model suggested that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, these factors are, first is perceived Usefulness (PU) .This is implies the degree to which a person believes that using a particular system would enhance his or her job performance.

Second is the perceived ease of use (PEOU).This is the degree to which a person believes that using a particular system would be free from effort (Davis, 1989).The attitude toward adoption will decide about the adopter's positive or negative behavior in the future concerning new technology. This model is one of the most frequently employed models for research into new information technology acceptance. Many other researchers have also utilized and suggested additions for TAM theoretical Framework (Venkatesh & Davis, 2000, Chuttur, 2009).

Many researchers have used TAM model when researching on ICT integration in management of schools, for example principals' characteristics influencing ICT in management of secondary schools (Edward, 2015) and also principals' role in promoting use and integration of information and communication technology in Public secondary schools (Tanui, 2013). However some researchers like Dishaw and Strong (1999) did argued that TAM framework lack the task to focus which has led to mixed findings since information and communication technology is task

oriented. These researchers therefore proposed the task-technology fit model to address this problem.

2.6.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

The unified theory of acceptance and use of technology (UTAUT) is a technology acceptance model formulated by Venkatesh and others in "User acceptance of information technology".
The UTAUT aims to explain user intentions to use an information system and subsequent usage behavior. The theory holds that there are four key constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions.
The first three are direct determinants of usage intention and behavior, and the fourth is a direct determinant of user behavior. Gender, age, experience, and voluntariness of use are posited to moderate the impact of the four key constructs on usage intention and behavior. The theory was developed through a review and consolidation of the constructs of eight models that earlier research had employed to explain information systems usage behavior (theory of reasoned action, technology acceptance model, motivational model, theory of planned behavior, a combined theory of planned behavior/technology acceptance model, model of personal computer use, diffusion of innovations theory, and social cognitive theory). Subsequent validation by Venkatesh et al. (2003) of UTAUT in a longitudinal study found it to account for an impressive 70% of the variance in Behavioral Intention to Use (BI) and about 50% in actual use.

The rationale behind using this theory was that, it was particularly useful in understanding; the technological innovation and how its attributes influenced school managers to integrate technology, the innovation, decision processes and the stages involved, the innovativeness and technological needs of different adopter categories, communication channels used by individuals to share information related to technology adoption; and organization unit of the social system and how it influences technology adoption.it is important for principals, senior teachers and assistant teachers must have knowledge of a new technology. They should be introduced to ICT resources such as computers, internet and relevant software. Technical support should equally be provided and they should be persuaded and be willing to actively participate in the implementation process by attending to various aspects of contexts within which the innovation is being used. Decision level involves training of the principals and teachers; this will lead to

acquisition of skills and development of different attitudes towards the innovation hence positive perception towards the use of the innovation. During the implementation process, principals, senior teachers and assistant teachers reflect on the advantage and effectiveness of integrating ICT in management of schools and as a result express their readiness towards ICT integration.

In this study, the attributes in the theory provide an outline that helps in understanding why some principals integrate ICT in the performance of their management tasks while others do not. The diffusion theory can be used to explain, visualize and account for factors that enhance or hinder the integration of ICT in the management of secondary schools. The theory also helps education policy developers to identify qualities that will make the integration of ICT in management of schools more appealing to prospective users. According to Rodgers (2011) the communication channels used to spread word about adoption of any innovation and the nature of the society determines the rate of adoption of a new technology. In schools this can be achieved through training or ICT literacy upgrading courses, policy statements and circulars from the Ministry of Education.The theory was found appropriate for this study because it brings out perceptions and factors that influence the integration of ICT in the management of secondary schools.

2.6.3. Theory of Technological Pedagogical Content Knowledge (TPACK)

This study was further guided by Technological Pedagogical Content Knowledge (TPACK) framework. School improvement approach to educational change embodies the long term goal of establishing a self-renewing school and stressed the central role at the school level to mediate change and focus on the problems and internal conditions of the school, (Tonduer ,2007). He further assert that the school level there should be clear goals and systematic strategies to direct educational innovations. In addition there should be team development and professionalism of principals and teachers. Strong leadership at school level is critical for an innovation to take root and to guide change efforts.

Teachers play a central role in school improvement. Teachers' experiences beliefs, emotions, knowledge, skills, motivation are critical in school improvement. Teacher's perception and actions towards changing and developing their teaching methods are influenced by what they believe as well as their knowledge. Therefore prioritizing teacher education and teacher

professional development are critical in an innovation such as ICT integration targeting improved classroom instruction and education quality.

The variables: teacher motivation, visionary leadership and school level effort were critical in this study.

In the TPACK framework, it is argued that effective technology integration for teaching specific subject matter requires understanding and skill to negotiate the relationships between Technology, Pedagogy, and Content,(Koehler,2011). A teacher who is able to negotiate the relationships represents a form of expertise different and broader than the knowledge of an expert in a discipline. In the PACK framework there exists a complex relationship between content, pedagogy and technological knowledge areas that form a useful organizational structure for defining what it is that teachers need to know to integrate technology effectively. Teachers require knowledge and skill to use technology, subject content knowledge and pedagogic knowledge for ICT integration in education.

2.7 Conceptual Framework

Conceptual framework is a diagrammatic representation of perceived relationship between study variables as shown in Figure 1.It identifies the variables that when put together explain the issue of concern. The conceptual framework is therefore the set of broad ideas used to explain the relationship between the independent variables (factors) and the dependent variables (outcomes).

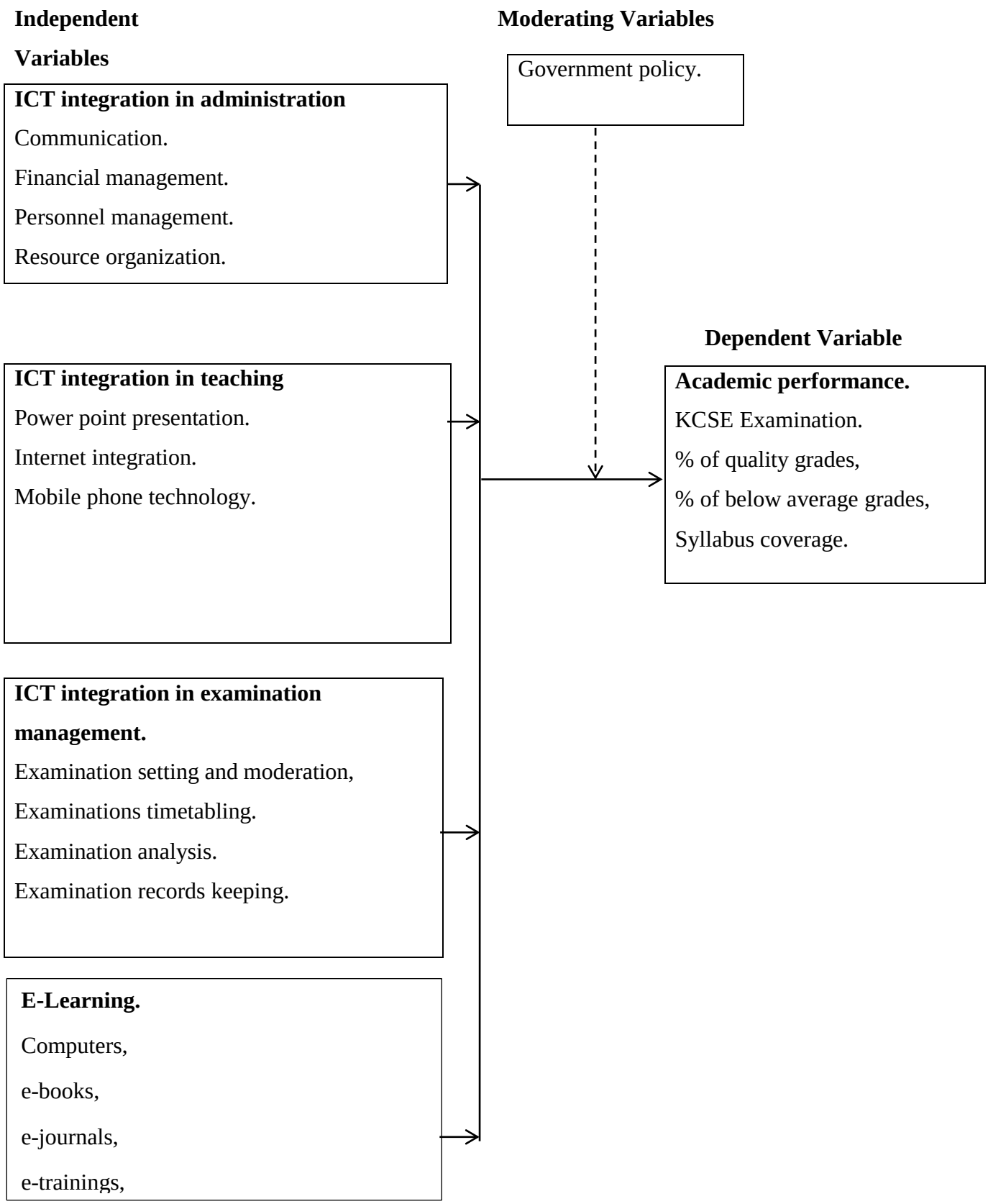
The framework shows that there three sets of variables which include independent variables, dependent variable and moderating variable.

Independent variables include ICT integration in administration management, CT integration in teaching, CT integration in examination management and e-learning. The dependent variable is academic performance. The moderating variable is the government policy.

As indicated in figure 1, each of the study variables has distinct parameters or indicators. ICT integration in administration is represented by communication, personnel management, resource management and financial management. On ICT integration in teaching, it is represented by internet use, power point presentations and mobile phone technology. For examination management, we have examination timetabling, examination setting, examination moderation and examination recording.in e-learning, we have e-books,e-journals,e-modules and e-trainings.

The dependent variable which is academic performance, we have high percentage of quality grades of C+ and above, reduction of wastage grades of D and below and faster syllabus coverage.

Figure 1: Conceptual Framework



2.8 Knowledge Gap

It is evident from the studies carried out in relation to ICT integration in teaching that a lot needs to be done to ensure academic performance improves. Very many researches have been done on why, despite a lot of investments by governments globally, not much in terms of academic improvements in schools has been realized.

Oyier et al (2015) investigated the Effects of ICT Integration in Management of Private Secondary Schools in Nairobi County, Kenya: Policy Options and Practices. His findings were that most of principals in secondary schools in Nairobi County aged below 50 years of age is an indication that most were willing to accept ICT. These principals have to accept convergence between telecommunication, broadcasting multimedia and related technologies that already bringing fundamental changes in education when they came into leadership. Secondly, with none of the principals above 15 years it is an indication that schools in Nairobi County are part of rapidly changing world in executing management tasks through ICT. Thirdly, most private secondary schools in Nairobi County have more than 300 students, which necessitates ICT integration platform for school management information system, whichever curriculum offered for coordination of administrative, financial and instructional tasks. Many of the schools had double or three streams per class made existence of ICT based school management information system is necessary.

Mutisya (2017), did a study on factors influencing integration of information and communication technology in the management of public secondary schools in kitui county, Kenya.

Her findings established that majority of the school principals use ICT in school management less frequently while internet is rarely used. It was also noted that some principals, senior teachers and assistant teachers had never used internet. It was also observed that principal's characteristics which include; age, gender, level of education and professional experience influence ICT integration in management of public secondary schools to a very great extent.

It is out of this realization that the researcher is doing this study to find out the influence of ICT integration on academic performance in public secondary schools in MakueniCounty.

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2.9 Summary of Literature Review

The level of ICT integration is determined by the interplay between the infrastructure, teacher motivation, innovations and development of e-pedagogies. In our world today, ICT has become a vital tool of our day-to-day life and how we do things in our work places.

ICT has played an important role in educational management. It has been found out that the use of ICT made it possible for teachers to maintain accurate student records, track and analyze performance and use the resulting information to make decisions about how to individualize instruction. ICT is used in management of the data that is crucial to the management of schools; thus it helps the administrators to get a better idea of the size of the educational system, student dropout and repetition, and the number of students per teacher. In some sense, this could be characterized as measuring the efficiency of the educational system and as a first step in improved resource allocation. Regarding the use of ICT in communication, it was found that ICT made the dissemination of information easy both within the institution and outside thus making easy the management task. There are other areas in education management where ICT has been used in the management of schools such as the use of ICT on the financial management, resource management, curriculum instruction management and the management of school-community relations which were the focus of this study.

In classroom delivery, instructional management aims at improving teaching and learning processes through a deliberate emphasis on ways and means of instilling excellence in quality of instruction. Modern teaching require educators to present a more efficient and modern instructional management to equip students with knowledge and skills that stimulate creativity and spur growth.

This why, ICT has become rather deeply rooted in educational settings. Their use has fostered qualitative changes in how teaching is approached, especially in terms of presenting contents audio visually, where PowerPoint is the most often used tool and also the use of internet and also use of mobile phone technology.

More than 20 years have elapsed since PowerPoint first appeared, and since then its presence in classrooms has risen considerably. Specifically, 90% of professors at the universities use PowerPoint in their theoretical classes, and of them, almost 50% literally transcribe the content

that is projected onscreen. This massive presence of PowerPoint in today's educational culture has prompted a debate on its use and effectiveness.

Research has shown that Internet-connected mobile devices such as netbooks and smart phones can allow students to access online courses while traveling among home, school, work, and athletic events. Online teachers can integrate these aspects of students' lives by building projects around personal experiences. Multitudes of educational possibilities become reality once the boundaries of time and place are removed.

In order to extend Internet use to larger numbers of teachers, it is useful to examine the following conditions, high levels of classroom connectivity; computer expertise; constructivist pedagogy; participation in staff development; high frequency of informal contacts with other teachers and involvement in professional leadership activities.
Many ICT based instructional applications provide an objective means of assessment. They can also maintain records of individual progress of each student and can assist teachers in identifying students' weaknesses and in determining measures that can be taken to address such weaknesses. According to research done in e- learning, as a modern strategy for teaching and learning, it is multi-dimensional and dynamic, changing according to context, circumstances and interest. Thus, there are different expressions or typology of e-learning. That is why researchers define e-Learning as "the systematic use of networked information and communication technology in teaching and learning".

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focused on the various steps that were followed in order to arrive at research findings that addressed both the research problem and objectives of the study. It covered the introduction, research design, the target population, sample size and sampling procedure, research instruments, data collection procedures, data analysis, and ethical consideration that was observed.

3.2 Research Design

The study adopted a descriptive research design in collecting data from the respondents. A research design is described as the blueprint of carrying out research study (Arwa ,2017). It shows the procedure of conducting the research study. The descriptive research design was preferred because it ensured complete description of the situation, making sure that there was minimum bias in the collection of data (Kothari, 2003). Descriptive research method is a method of collecting information by administering questionnaires to a sample of individuals; it allowed the researcher to generate both numerical and descriptive data that was used to measure variables.

3.3 Target population

According to Mugenda and Mugenda, target population is defined as that population which a researcher wants to generalize the results of the study. The target population comprised of an aggregate of individuals with similar characteristics and with respect to a particular area of the study. This target population was therefore constituted of all public secondary schools in Makueni County totaling 379 with teacher's population of 3158. This data on the number of the schools and teachers in the whole of Makueni County was collected from the County Education Office in Makueni. This was from EMIS returns forms from all schools. The target population group composed of the Principals, Deputy Principals, Examination Officers, Head of Departments and teachers of targeted schools.

Table 3. 1: Target Population

Category	Population	Percentage
Principals	379	12%
Deputy principal	379	12%
Examination officer	379	12%
Head of departments	1516	**48%**
Teachers	505	**16%**
Total	**3158**	**100**

3.4 Sample Size and Sampling Procedure.

This section describes the procedure that was used in determining the elements under the study and exactly what size of the element under study was considered. According to Kothari (2004) a sample is defined as a subset of the target population. Good sample should be a representative of the target population.

According to Mugenda and Mugenda (2003) sampling procedure may be defined as systematic process of identifying individuals for the study to represent the larger group from which they are selected.

To arrive at the sample size FISHERS formula was used. The formula was used as outlined below:

nf =n/1+(n)N

Where;

nf =the desired sample size (if the target population is less than 10,000).

n = the desired sample size (when the population is more than 10,000)

N = the estimate of population size.

Therefore

$$\mathbf{n=Z^2pq/d^2}$$

Since there was no estimate available of the proportion in the target population assumed to have the characteristics of interest,50% was used OS recommended by Fisher et al.

Therefore:

If the proportion of a target population had a certain characteristic of .50, the z-statistic is 1.96, and the desire accuracy was .05. therefore, the sample size was:

$$\mathbf{n= \frac{(1.96)^2 (.50) (.50)}{(.05)^2}}$$

$$\mathbf{=\underline{384}}$$

Sample population was therefore:

nf =n/(1+n)/N

where

n=334

N=3158

$$\mathbf{nf= \frac{384}{1+(384)/3158}} \mathbf{=342.37=343(rounded\ up\ to\ whole\ number)}$$

According to Mugenda and Mugenda (2003), sampling procedure is defined as a systematic process of identifying individuals for a study to represent the larger group from which they are selected. Cluster sampling approach was used in this research study to group the population into 9 sub counties.

Simple random sampling was then used to choose one sub county. The number of principals, and Deputy Principals, Examination officers, Head of departments and teachers to be included in the sample was decided through stratified random sampling, while purposive sampling was used to choose all the principals of all the schools that were included in the study.

Simple random sampling was then used to select teachers in every school.

Table 3. 2: Sample Size

Category	Population	Sample
Principals	379	22
Deputy principal	379	22
Examination officer	379	22
Head of departments	1516	110
Teachers	505	167
Total	**3158**	**343**

3.5 Data Collection Instruments

The research study used questionnaires to collect primary data. The questionnaires were used because they were easy to administer and gave the respondent sufficient time to arrive at a well thought out response and free from researchers bias. The questionnaires comprised of five parts. They captured the respondents' demographics and also focus on the four research objectives of the study.

3.6 Pilot Testing

According to Kothari (2004) research instrument should be subjected to a pilot study before the main study is undertaken. The piloting of the research instrument was carried out amongst few selected respondents from outside selected sample. They included two public secondary school composed of two principals,two deputy principals,two examination officers and eight head of department.The rationale of the pilot study was to assess both validity and reliability of the research instrument.

3.7 Validity of Research Instruments

Mugenda and Mugenda (2003) defined validity as the accuracy and meaningfulness of inferences which are based on the research results. It gives the degree to which results obtained from analysis of the data actually represent the phenomenon under study. Content validity of the research instrument can be enhanced through expert judgment (Best & Kahn, 2011).

The researcher prepared the instrument in consultation with the research supervisors to ensure that the specific areas or objectives were covered by the instruments. Expert judgment enabled the researcher to identify areas of weakness of the instruments and made the appropriate corrections which were incorporated in the instruments to increase its validity. Instrument

validity was established by pre-testing of data collection tools by a pilot study. The instruments were administered to four types of respondents from two types of public secondary schools in the neighboring Sub County. These schools had the same social and economic environment with the ones under study. The instruments were modified in order to achieve the desired objective.

3.8 Reliability of the Research Instruments

Reliability of the questionnaire was evaluated through administration of the said instrument to the pilot group. The acceptable reliability coefficient is 0.7 and above (Song et al., 2014). A construct composite reliability co-efficient (Cronbach alpha) of 0.7 or above, for all the constructs, is considered to be adequate for this study. The results were as shown in Table 4.2.

Table 3. 3: Reliability Analysis

	Cronbach's alpha	Decision
ICT integration in administration	.908	Reliable
ICT integration in teaching	.856	Reliable
ICT integration in examination management	.712	Reliable
E- learning	.833	Reliable

From the results, ICT integration in administration was more reliable with an Alpha value of 0.908, followed by ICT integration in teaching with an Alpha value of 0.856 then e-learning with an Alpha value of 0.833 while ICT integration in examination management with an Alpha value of 0.711 had the least reliability. This, therefore, depicts that the research instrument was reliable and no amendments were required.

3.9 Data Collection Procedure

The researcher delivered the questionnaires in person assisted by a research assistant. The questionnaires were distributed for a period of two weeks to ensure sufficient data is collected. The researcher was present during the filling of the questionnaires to offer guidance where appropriate.

3.10 Data Analysis

The research study used descriptive data analysis method. This was because the designed used was descriptive. Data was analyzed quantitatively using the statistical package for social scientist (SPSS). Quantitative data was analyzed using descriptive statistics calculated as proportions,

frequency and percentages. Pearson correlation coefficient was used to determine the relationship between the study variables.

3.11 Ethical Considerations

The ethical issues relating to the study was addressed by maintaining high level of confidentiality of the information volunteered by the respondents and noting that the information so obtained was not to be used for any other reasons other than drawing conclusions with a view to addressing the research problem and objectives of the study. Permission was sought from all relevant bodies before the commencement of the research study.

3.12 Operationalization of Variables

According to Mugenda and Mugenda (2003), operationalization of variables is finding and defining measurable and quantifiable concept in a summarized form to show the achievements of the research variables, specific objectives and tools of analysis.

Table 3.3 Operationalization of variables in the study

Objectives	Variables	Indicators	Measurement scale	Research approach	Tools of analysis
To examine how ICT integration in administration management influences academic performance of public secondary schools in Makueni County.	ICT integration in administration management	Communication data, Emails records Phones sms . Personnel record in soft copy. Resource organization records	Ordinal Nominal	Questionnaire	Means, Standard deviation, Deviations, Frequencies, Percentage. Correlation.
To assess how the use of ICT integration in teaching influences the academiic performance in secondary schools in Makueni County.	ICT integration in teaching	Power point presentation. Internet. Mobile phone. Downloaded internet materials.	Ordinal, Nominal	Questionnaire	Means, Standard deviation, Deviations, Frequencies, Percentage. Correlation.
To examine how ICT integration in examination management influence the academic performance in secondary schools in Makueni County.	ICT integration in examination management	Examination set Moderated exams., Examinations timetable. Examination that have been analysed. Examination records	Ordinal, Nominal	Questionnaire	Means, Standard deviation, Deviations, Frequencies, Percentage. Correlation.
To establish how e-learning influences the academic performance in secondary schools in Makueni County.	e-learning	Computers, e-books, e-journals, e-trainings,	Ordinal, Nominal	Questionnaire	Means, Standard deviation, Deviations, Frequencies, Percentage. Correlation.
Academic performance in public schools.	Academic performance	Quality grades of C+ and above. Low wastage grades D- and below. Faster syllabus coverage.	Ordinal, Nominal	Questionnaire	Standard deviation, Deviations, Frequencies Percentages.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter focuses on the data analysis, interpretation and presentation of the findings. the main purpose of the study was to establish the influence of ICT integration on academic performance in public secondary schools in Kenya based on Makueni County. The researcher used descriptive and inferential statistics to analyze the data and the findings were presented in tables.

4.2 Questionnaire Return Rate

The researcher targeted 22 principals, 22 deputy principals, 110 Head of departments and 22 examination officers and 167 teachers. The response rate analysis is as illustrated in Table 4.1.

Table 4. 1: Response Rate Analysis

Managerial Level	Administered	Returned	Response Rate
Principals	22	20	90.9
Deputy Principals	22	21	95.5
Head of departments	110	102	92.7
Examination officers	22	22	100.0
Teachers	167	154	92.2
Total	**343**	**319**	**93.0**

From the results, the out of the 343 targeted respondents, only 319 returned fully filled questionnaires. This represented a response rate of 93%. This implies that the response rate obtained was good since it was more than 50% as per Sproul (2011) recommendations that a response rate for data analysis should be 50% or more.

4.4 Demographic Information

The study sought to enquire on the respondents' general information so as to ascertain the eligibility of the respondents to participate in this study. It was also used to assess how reliable the data collected from the respondents would be. The respondents' demographic information sought in this study included gender, education background, age group and type of their school.

4.4.1 Gender of the Respondents

The researcher sought to establish gender distributions of the respondents to assess the gender biasedness in data collection. The findings were indicated in Table 4.3.

Table 4.2: Respondents Gender Distributions

	Principals		Deputy Principals		Head of Departments		Examination officers		Teachers	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Male	17	85	13	61.9	54	52.9	16	72.7	87	56.5
Female	3	15	8	38.1	48	47.1	6	27.3	67	43.5
Total	**20**	**100**	**21**	**100**	**102**	**100**	**22**	**100**	**154**	**100**

As per the findings on gender analysis, most of the principals were male (85%) and female principals were 15%. Concerning deputy principals, most of them were male as shown by 61.9% while the rest were female at 38.1%. Further most of the head of departments were male at 52.9% with female being 47.1%. The male examination officers were only 72.7% while female counterparts were 27.3%. Moreover, the findings showed that most of the teachers were male at 56.7% while female teachers were 43.5%. This implies that the leadership of most schools is dominated by male where they are termed as more vigilant than their female counterparts. However, the researcher was not biased in data collection based on the gender since all the genders were represented in each position while collecting data.

4.4.2 Education Background

The researcher further sought to assess the education background of the respondents. Therefore, the respondents were asked to indicate their education background. Their responses were as shown in Table 4.4.

Table 4.3: Education Background

	Principals		Deputy Principals		Head of Departments		Examination officers		Teachers	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Certificate	0	0	0	0.0	0	0.0	0	0.0	0	0.0
Diploma	0	0	4	19.0	14	13.7	4	18.2	51	33.1
Bachelor's degree	19	95	16	76.2	84	82.4	18	81.8	103	66.9
Post graduate degree	1	5	1	4.8	4	3.9	0	0.0	0	0.0
Total	**20**	**100**	**21**	**100**	**102**	**100**	**22**	**100**	**154**	**100**

As per the findings, majority of the principals had a bachelors' degree at 95% and others had a post graduate degree at 5%. Most of the deputy principals had a bachelors' degree (76.2%) while others had diploma (19%) and post graduate degree (4.8%). Moreover, the head of departments had a bachelors' degree at 82.4% while those who had a diploma at 13.7% and postgraduate degree holders were 3.9%. Further, many of the examination officers had a bachelors' degree at 81.8% while 18.2% had a diploma. In addition, the teachers who had a bachelor's degree were 66.9% while others had a diploma at 33.1%. Most of the respondents in all positions had a bachelors' degree which is termed as one of the requirements for anyone in Kenya to serve as a secondary school teacher. However, the minimum requirements for one to be secondary school teacher is a diploma. The findings also show that all the respondents were learnt enough to give reliable information on the subject under study.

4.4.3 Respondents Age Group

The respondents were asked to indicate their age group. Their responses were as shown in Table 4.5.

Table 4.4: Respondents Age Group

	Principals		Deputy Principals		Head of Departments		Examination officers		Teachers	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
18 - 23 years	0	0	0	0.0	0	0.0	0	0.0	0	0.0
24 - 29 years	0	0	0	0.0	8	7.8	9	40.9	43	27.9
30 - 35 years	0	0	0	0.0	17	16.7	5	22.7	50	32.5
36 - 40 years	0	0	3	14.3	21	20.6	0	0.0	35	22.7
Above 41 years	20	100	18	85.7	56	54.9	8	36.4	26	16.9
Total	**20**	**100**	**21**	**100**	**102**	**100**	**22**	**100**	**154**	**100**

From the findings, all the principals were above 41 years. Concerning the deputy principals, most of them belonged to 41 years and above age group at 85.7% while other were aged 36 to 40 years at 4.3%. The findings also showed that most of the head of departments were aged above 41 years at 54.9% while others were aged 36 to 40 years at 20.6%, aged 30 to 35 years at 16.7% and 24 to 29 years at 7.8%. Further, most of the examination officers were aged 24 to 29 years at 40.9%, above 41 years at 36.4% and 30 to 35 years at 22.7%. Teachers who are aged 30 to 35 years at 32.55, aged 24 to 29 years at 27.9%, aged 36 to 40 years at 22.7% while others were aged above 41 years at 16.9%. This shows that the data was collected across all the age groups hence the data could be relied upon.

4.4.4 Type of their School

The respondents were also asked to indicate the type of school they belong to. Their replies were as shown in Table 4.6.

Table 4.5: Type of Respondents School

	Principals		Deputy Principals		Head of Departments		Examination officers		Teachers	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Boys boarding	3	15	3	14.3	3	13.6	3	13.6	3	13.6
Girls boarding	2	10	2	9.5	2	9.1	2	9.1	2	9.1
Mixed boarding	0	0	0	0.0	0	0.0	0	0.0	0	0.0
Mixed day	15	75	16	76.2	17	77.3	17	77.3	17	77.3
Total	**20**	**100**	**21**	**100**	**22**	**100**	**22**	**100**	**22**	**100**

As per the study results, most of the principals were from mixed day schools as shown by 75%, from boys' school as shown by 15% and from girls boarding as shown by 10%. On the same deputy principals from the mixed day schools were 76.2%, from boys boarding were 14.3% and from girl's school were 9.5%. Generally, most of the respondents from all the positions were from mixed day schools with none coming from mixed boarding school. This implies that the information obtained from the respondents was from a wide scope and hence it was reliable.

4.5 Influence of ICT Integration on Academic Performance in Public Secondary Schools

The researcher sought to examine how ICT integration in administration, use of ICT integration in teaching, how ICT integration in examination management and how e- learning influences the academic performance in public secondary schools in Makueni County.

4.5.1 ICT and its Integration in School Administration

The study sought to examine how ICT integration in administration influences academic performance of public secondary schools in Makueni County.

4.5.1.1 Availability of ICT Resources

Principals and their deputies were asked to indicate the extent of availability of the various ICT resources by use of Likert scale where 4- highly available, 3-moderately available, 2- not sure and 1- not available. Their responses were as presented in Table 4.8.

Table 4.6: Extent of Availability of the Various ICT Resources

	Mean	Std. Dev.
Computers	3.9817	.8163
Scanners	2.8165	.6690
Photocopiers	3.5688	1.0217
Internet	2.1284	1.1635
Printers	3.5413	.9674

As per the findings, the respondents indicated that computers were highly available as shown by a mean of 3.9817, photocopiers were highly available as shown by a mean of 3.5688 and that printers were highly as illustrated by a mean of 3.5413. Further the respondents reported that scanners were moderately available as shown by a mean of 2.8165 and that they were not sure if internet was available as shown by a mean of 2.1284.

4.5.1.2 Frequency of Using ICT in School Management

Further the principals were asked to indicate how often they use ICT in school management. Their replies were as shown in Table 4.8.

Table 4.7: Frequency of Using ICT in School Management

	Frequency	Percent
On daily basis	11	55
Twice a week	3	15
Once a month	5	25
Never	1	5
Total	**20**	**100**

Most of the principals indicated that they use ICT in school management daily as shown by 55%. Others principals indicated that they use ICT in school management once a month at 25%, 155 indicated twice a week while only 5% never use ICT in school management.

4.5.1.3 Availability of Various Computer Programs

The principals were also asked to indicate the availability of various computer programs to different departments in the school. Their responses were as shown in Table 4.9.

Table 4.8: Availability of Various Computer Programs

Computer programs	Mean	Std. dev.
Microsoft word and Microsoft excel.	3.553	0.581
Internet and email.	3.105	0.802
HODs, Examination Officers and Teachers	**Mean**	**Std. dev.**
Microsoft word	3.968	0.771
Microsoft excel	4.345	0.633
Internet and email	3.971	0.725
Microsoft power point	4.446	0.615

From the findings, the principals indicated that microsoft word and Microsoft excel as shown by a mean of 3.553 is high available to all departments in the school and internet and email as illustrated by a mean of 3.105 is moderately available to all departments in the school. The head of departments and examination officers indicated that they use Microsoft excel (Mean=4.345), and Microsoft power point (Mean=4.446), Internet and email (Mean=3.971) and Microsoft word (Mean=3.968) daily.

4.5.1.4 Extent the School Management Uses ICT in the Various Areas

Further principals were asked to indicate extent to which the school management uses ICT in the various areas. The findings are shown in Table 4.10.

Table 4.9: Extent the School Management Uses ICT in the Various Areas

Deputy	Mean	Std. Dev.
Accounting	4.297	0.862
Personnel management records.	4.064	0.845
Students admission records	3.891	0.584
Maintenance of BOM records.	3.426	0.867
Maintenance of teachers' performance records	4.105	0.802
Record of physical materials	3.654	0.847
Preparation and maintenance of staff meetings records	4.312	0.545

From the study findings, the principals indicated that ICT is used to some extent in preparation and maintenance of staff meetings records as shown by a mean of 4.312, accounting as illustrated by a mean of 4.297, maintenance of teachers' performance records as shown by a mean of 4.105, personnel management records as indicated by a mean of 4.064, student's

admission records as shown by a mean of 3.891 and record of physical materials as illustrated by a mean of 3.654. Other principals were undecided whether ICT is used in maintenance of BOM records as illustrated by a mean of 3.426.

4.5.1.5 Administrative Tasks

Using the Likert scale where 5- daily, 4- weekly, 3- not sure, 2- occasionally and 1-never, the deputy principals HODs, Examination Officers and Teachers were asked to indicate how frequently they use ICT to perform the various administrative tasks. Their responses were as shown in Table 4.11.

Table 4.10: Frequency of Using ICT to Perform Administrative Tasks

Deputy principals	**Mean**	**Std. Dev.**
Preparation of school time table	4.559	0.599
Maintenance of students' discipline records	2.407	0.545
Preparation of lesson notes, lesson plans record of work	2.128	0.935
Maintenance of teachers' attendance records	3.027	0.727
Maintenance of teachers leave and sick-off applications	3.568	0.812
HODs, Examination Officers and Teachers	**Mean**	**Std. Dev.**
Preparation of departmental time table.	4.302	.604
Preparation of student' report forms.	4.329	.768
Maintenance of students' performance records.	4.076	.653
Preparation of lesson notes.	3.814	.959
Preparation of exam records.	3.612	.872
Preparation of record of work covered	3.802	.792

From the findings, the deputy principals indicated that daily they use ICT in preparation of school time table as shown by a mean of 4.5596 and that weekly they use ICT in maintenance of teachers leave and sick-off applications as shown by a mean of 3.5688. Further, the respondents indicated that they were not sure if they use ICT in maintenance of teachers' attendance records as illustrated by a mean of 3.0275 and that they occasionally use ICT in maintenance of students' discipline records as shown by a mean of 2.407. Moreover, the respondents indicated that they occasionally use ICT in preparation of lesson notes, lesson plans record of work as shown by a mean of 2.1284.

On The same, the HODs, examination officers and teachers indicated that they never use ICT in preparation of departmental time table as illustrated by a mean of 4.302, in preparation of student' report forms as shown by a mean of 4.329, in maintenance of students' performance records as shown by a mean of 4.076 and in preparation of lesson notes as shown by a mean of

3.814. They also indicated that they never use ICT for preparation of record of work covered as shown by a mean of 3.802 and that for preparation of exam records as shown by a mean of 3.612.

4.5.2 ICT Integration in Teaching

The study sought to assess how the use of ICT integration in teaching influences the academic performance in public secondary schools in Makueni County.

4.5.2.1 Frequency of Use of ICT Resources

The respondents were asked to indicate how often they use the various ICT resources during their lesson delivery using a Likert Scale of 1-5; where 5- daily, 4- weekly, 3- not sure, 2- occasionally and 1-never. The findings were as shown in Table 4.12.

Table 4.11: Frequency of Use of ICT Resources

	Mean	Std. Deviation
Internet	2.451	0.567
Power point presentations	2.128	1.163
Mobile phone technology	4.159	0.819

As per the findings, the respondents indicated that weekly they use mobile phone technology as shown by a mean of 4.159 and that they were not sure if they use Internet as shown by a mean of 2.451. Further the respondents indicated that they occasionally use power point presentations as shown by a mean of 2.1284.

4.5.2.2 Influence of ICT Integration in the Lesson

Using a scale of 1-5 where 5- strongly agree, 4- agree, 3- neutral, 2- disagree and 1- strongly disagree, respondents gave their opinion on the level of agreement with the statements on the influence of using ICT in the teaching process. Their response is given in Table 4.13.

Table 4.12: Influence of ICT Integration in the Lesson

	Mean	Std. Deviation
ICT enhance understanding during lesson presentation.	4.221	0.788
ICT makes teaching more interesting for me and learners.	4.204	0.847
ICT makes preparation of lessons to be easy and faster.	2.805	0.610
ICT improves the presentation of material in my lessons.	4.5688	.7119
ICT has given me more confidence when teaching	3.903	0.866
ICT positively changes the relationship between me and my students	4.097	0.866

From the findings, the respondents indicated that they strongly agree that ICT improves the presentation of material in my lessons as shown by a mean of 4.5688. The respondents also agreed that ICT enhance understanding during lesson presentation as shown by a mean of 4.221, ICT makes teaching more interesting for me and learners as illustrated by a mean of 4.204, ICT positively changes the relationship between them and their students as shown by a mean of 4.097 and that ICT has given them more confidence when teaching as shown by a mean of 3.903. Finally, the respondents were neutral about whether ICT makes preparation of lessons to be easy and faster as shown by a mean of 2.805.

4.5.3 ICT Integration in Examination Management

The study sought to establish how if ICT integration in examination management influence the academic performance in public secondary schools in Makueni County.

4.5.3.1 ICT Integration in Examination Management

The respondents were asked for how long they have been using computer and its applications for examination management purposes. Their responses were presented in Table 4.14.

Table 4.13: ICT Integration in Examination Management

	Frequency	Percent
Never used	1	0.3
Less than 1 years	4	1.3
One year	51	16.0
More than two years	263	82.4
Total	**319**	**100**

As per the findings, majority of the respondents indicated that they have been using computer and its applications for examination management purposes for more than 2 years as shown by 82.4%, for one year as shown by 16%, for less than one year as shown by 1.3% while others indicated that they have never used as shown by 0.35. This implied that in most schools have been using computer and its applications for examination management purposes for long.

4.5.3.2 ICT use by Examination Department Management

The respondents indicated the extent to which the examination department management uses ICT in the following areas by use of a Likert Scale where 5- Great extent,4- Some extent,3- Undecided,2- Less extent and 1- Never. Their responses were presented in Table 4.15.

Table 4.14: ICT Use by Examination Department Management

	Mean	Std. Dev.
Examination analysis.	4.097	0.866
Examination moderation,	2.548	0.582
Examination setting.	2.805	0.610
Examinations timetabling.	4.027	0.871
Examination records keeping.	4.159	0.819

The respondents indicated that they greatly use ICT for examination records keeping as shown by a mean of 4.159, examination analysis as shown by a mean of 4.097 and for examinations timetabling as illustrated by a mean of 4.027. Moreover, the respondents indicated that they moderately use ICT for examination setting as indicated by a mean of 2.805 and for examination moderation as shown by a mean of 2.548.

4.5.3.3 Influence of ICT Integration on Examination Management

The respondents gave their opinion on the influence of using ICT in examination management process by use of Likert scale of 1-5 where 5- strongly agree, 4- agree, 3- neutral, 2- disagree and 1- strongly disagree. Table 4.16 presents their opinions.

Table 4.15: Influence of ICT Integration on Examination Management

	Mean	Std. Dev.
ICT integration saves time making it possible to meet deadlines.	4.3486	.6719
ICT integration enhances in-depth analysis of exams.	3.9817	.8163

From the findings, the respondents agreed that ICT integration saves time making it possible to meet deadlines as shown by a mean of 4.3486 and that ICT integration enhances in-depth analysis of exams as illustrated by a mean of 3.9817.

4.5.4 E-Learning

Further, the study sought to establish how e- learning influences the academic performance in public secondary schools in Makueni County.

4.5.4.1 Availability of E-Learning Resources

The respondents indicated the extent of the availability of the following list of e-learning resources which are key to effective teaching and learning by use of a Likert Scale where 4- highly available, 3-moderately available, 2- not sure and 1- not available. Table 4.17 presents their responses.

Table 4.16: Extent of Availability of E-Learning

	Mean	Std. Dev.
Computer/tablets	3.964	0.876
E-books	2.146	.901
E-journals	2.128	1.163
E-modules	1.824	.921
Computer lab/library	3.541	.967

From the findings, the respondents indicated that computer/tablets as shown by a mean of 3.964 and computer lab or library as indicated by a mean score of 3.541 are highly available. They however not sure of the availability of E-books as shown by a mean of 2.146, E-journals as illustrated by a mean of 2.128 and E-modules as expressed by a mean of 1.824.

4.5.4.2 Frequency of Conducting E-Learning Trainings

The respondents gave their opinions on how often their school conduct e-learning trainings to teachers and students by use of a Likert scale where 5- always,4-often,3- at times,2- rarely and 1-never. Their responses were presented in Table 4.18.

Table 4.17: Frequency of Conducting E-Learning Trainings to Teachers and Students

	Frequency	Percent
Always	7	2.3
Often	19	6.0
At times	82	25.6
Rarely	98	30.8
Never	113	35.3
Total	**319**	**100**

From the findings, the respondents indicated that they never conduct e-learning trainings to teachers and students as shown by 35.5%, rarely as shown by 30.5%, at times as shown by 25.6%, often as shown by 6% and always as shown by 2.3%. this implies that e-learning trainings to teachers and students has not been conducted in most secondary schools.

4.5.4.3 Influence of E-Learning to Learners

The respondents were asked to indicate their level of agreement with each of the following statements on influence of e-learning to learners by use of a Likert scale of 1-5 where 5- strongly agree, 4- agree, 3- neutral, 2- disagree and 1- strongly disagree. Table 4.19 presents their response.

Table 4.18: Level of agreement with statements on influence of e-learning to learners

	Mean	Std. Dev.
E-learning enable you to work alone at your own pace.	1.908	.9082
E-learning enable you to engage in enquiry-based activities.	3.204	0.734
E-learning enable one to participate in assessing his/her work.	2.816	.6690

From the findings, the respondents were neutral on the facts that E-learning enable you to engage in enquiry-based activities as shown by a mean of 3.204 and that E-learning enable one to participate in assessing his/her work as shown by a mean of 2.816. However, the respondents disagreed that E-learning enable you to work alone at your own pace as shown by a mean of 1.908.

4.5.5 ICT Influence on KCSE Performance

The respondents gave their opinions on the extent to which they agree with each of the following statement on how ICT integration influences KCSE performance in their school. By use of a Likert scale of 1-5 where 5- strongly agree, 4- agree, 3- neutral, 2- disagree and 1- strongly disagrees. Their opinions were presented in Table 4.20.

Table 4.19: ICT Influence on KCSE Performance

	Mean	Std. Deviation
It enhances faster syllabus coverage there by better performance.	3.832	0.789
More quality grades of C+ and above.	4.407	0.752
Enhances better understanding leading to few wastage grades i.e D plain and below.	4.5596	.5999

As per the findings, the respondents strongly agreed that ICT enhances better understanding leading to few wastage grades that is D plain and below as shown by a mean of 4.5596. The respondents further agreed that there have been more quality grades of C+ and above as shown by a mean score of 4.407 and that ICT enhances faster syllabus coverage there by better performance as shown by a mean of 3.832.

4.6 Inferential Statistics

The data presented before on ICT and its integration in school administration, ICT integration in teaching, ICT integration in examination management, E-learning and academic performance of public secondary schools in Makueni County were computed into single variables per factor by obtaining the averages of each factor. Correlations analysis and multiple regression analysis were

then conducted at 95% confidence interval and 5% confidence level 2-tailed to establish the relationship between the variables. The research used statistical package for social sciences (SPSS V 21.0) to code, enter and compute the measurements of the Pearson's Product Moment Correlation and multiple regression.

4.6.1 Pearson's Product Moment Correlation

A Pearson's Product Moment Correlation was conducted to establish the strength of the relationship between the variables. The findings are presented in Table 4.21.

Table 4.20: Correlation Matrix

		Academic performance	ICT Integration in School Administration	ICT Integration in Teaching	ICT Integration in Examination Management	E-Learning
Academic performance	Pearson Correlation	1				
	Sig. (2-tailed)	.				
ICT and its Integration in School Administration	Pearson Correlation	.806	1			
	Sig. (2-tailed)	.029	.			
ICT Integration in Teaching	Pearson Correlation	.603	.522	1		
	Sig. (2-tailed)	.016	.017	.		
ICT Integration in Examination Management	Pearson Correlation	.606	.742	.587	1	
	Sig. (2-tailed)	.028	.013	.018	.	
E-Learning	Pearson Correlation	.881	.543	.723	.521	1
	Sig. (2-tailed)	.006	.008	.003	.016	.

Results in table 4.9 reveal that there is a strong, positive and significant correlation between ICT and its Integration in School Administration and academic performance of public secondary schools in Makueni County. (r = 0.806, p value=0. 029). In addition, the study reveals that the correlation between ICT Integration in Teaching and academic performance of

public secondary schools in Makueni County is positive and significant (r=0.603, p value=0.016). Further, the study reveals that the correlation between ICT Integration in Examination Management and academic performance of public secondary schools in Makueni County is positive and significant (r=0. 606, p value=0.028). Finally, the study establishes that there was a very strong, positive and significant correlation between E-Learning and academic performance of public secondary schools in Makueni County. (r=0.881, p value=0.006). This implies that all the variables had a positive and significant correlation with academic performance of public secondary schools in Makueni County.

4.6.2 Multiple Regression Analysis

In this study, a multiple regression analysis was conducted to test the effect among predictor variables. The summary of regression model output is presented in Table 4.23

Table 4.21: Summary of Regression Model Output

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.858	0.737	0.733	1.394

The study found that independent variables selected for the study (i.e. ICT and its Integration in School Administration, ICT Integration in Teaching, ICT Integration in Examination Management and E-Learning accounted for 73.3% of the variations in factors influencing academic performance of public secondary schools in Makueni County since the adjusted R square was 0.733. According to the test model, 26.7% percent of the variation in the factors influencing academic performance of public secondary schools in Makueni County could not be explained by the model. Therefore, further studies should be done to establish the other factors that contributed the unexplained (26.7%) of the variation in academic performance of public secondary schools in Makueni County.

The analysis of variance results for the relationship between the four independent variables and the factors influencing academic performance of public secondary schools in Makueni County is shown in Table 4.24.

Table 4.22: Summary of One-Way ANOVA results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1724.82	4	431.205	219.803	.000
	Residual	616	314	1.962		
	Total	**2340.82**	**318**			

The probability value of 0.000 indicates that the regression relationship was significant in predicting the effects of ICT and its Integration in School Administration, ICT Integration in Teaching, ICT Integration in Examination Management and E-Learning on academic performance of public secondary schools in Makueni County. The calculated F (219.803) was significantly larger than the critical value of F= 2.4004. This again shows that the overall test model was significant.

The Regression coefficients for the relationship between the four independent variables and academic performance of public secondary schools in Makueni County are shown in Table 4.25.

Table 4. 23:Regression coefficients

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	0.984	0.208		4.731	.000
ICT and its Integration in School Administration	0.896	0.442	0.772	2.027	.043
ICT Integration in Teaching	0.756	0.276	0.666	2.739	.007
ICT Integration in Examination Management	0.732	0.349	0.643	2.097	.037
Learning and adoption	0.961	0.356	0.813	2.699	.007

The established multiple regression equation for predicting factors influencing academic performance of public secondary schools in Makueni County. in Buuri constituency, Meru County, Kenya from the four independent variables was:

$Y = 0.984 + 0.896X_1 + 0.756X_2 + 0.732X_3 + 0.961X_4$

Where, Y= Academic performance of public secondary schools in Makueni County.

β_0=constant

$\beta_1, \beta_2, \beta_3$ and β_4 = regression coefficients

X_1= ICT and its Integration in School Administration

X_2= ICT Integration in Teaching

X_3= ICT Integration in Examination Management

X_4= E-Learning

The regression equation above has established that taking all factors into account (ICT and its Integration in School Administration, ICT Integration in Teaching, ICT Integration in Examination Management and E-Learning) constant at zero, academic performance of public secondary schools in Makueni County was 0.984. The findings presented also show that taking all other independent variables at zero, a unit increase in the ICT and its Integration in School Administration would lead to a 0.896 increase in the score of academic performance of public secondary schools in Makueni County and a unit increase in the scores of ICT Integration in Teaching would lead to a 0.756 increase in the score of academic performance of public secondary schools in Makueni County. Further, the findings show that a unit increases in the scores of ICT Integration in Examination Management would lead to a 0.732 increase in the score of academic performance of public secondary schools in Makueni County.

The study also found that a unit increase in the scores of E-Learning would lead to a 0.961 increase in the score of academic performance of public secondary schools in Makueni County. Overall, E-Learning had the greatest effect on the academic performance of public secondary schools in Makueni County, followed by ICT and its Integration in School Administration, then ICT Integration in Examination Management while ICT Integration in Teaching had the least effect to the academic performance of public secondary schools in Makueni County. All the variables were significant (p-values < 0.05).

CHAPTER FIVE

SUMMARY OF THE FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of the data findings, discussion of the data findings, conclusion drawn from the findings highlighted and recommendation made. The conclusions and recommendations drawn are focused on addressing the objective of the study.

5.2 Summary of the Findings

The study sought to establish the influence of ICT integration on academic performance of public secondary school in Kenya:a case of Makueni County. The study focused on the influence of ICT integration in administration , teaching, examination management and e- learning on academic performance in public secondary schools in Makueni County. This section provides a summary of both descriptive and inferential findings of each of the variables under study.

5.2.1 ICT Integration in Administration

The study sought to examine how ICT integration in administration influences academic performance of public secondary schools in Makueni County. The Study found that computers, photocopiers were highly available and that printers were highly available highly. Further the study found that scanners were moderately available and internet was not available. The study also found that the school administration and the staff use ICT in school management daily. The study further revealed that Microsoft word and Microsoft excel were computer programs that were highly available to all departments in the school with internet and email being moderately available. These programs were revealed to have been used daily by school head of departments and examination officers.

Further, the study revealed that ICT is used to some extent in preparation and maintenance of staff meetings records, accounting, maintenance of teachers' performance records, personnel management records, student's admission records and record of physical materials. The study also established that ICT is used daily in preparation of school time table and weekly for maintenance of teachers leave and sick-off applications. Further, it was clear that ICT is not used in maintenance of teachers' attendance records and that most schools occasionally use ICT in

maintenance of students' discipline records. Moreover, the study established that ICT never used in preparation of departmental time table, in preparation of student' report forms, in maintenance of students' performance records and in preparation of lesson notes. The study also revealed that ICT id never used for preparation of record of work covered and that for preparation of exam records.

5.2.2 ICT Integration in Teaching

The study sought to assess how the use of ICT integration in teaching influences the academic performance in public secondary schools in Makueni County. The study found that most of school staff weekly use mobile phone technology and that don't use Internet while teachers occasionally use power point presentations. The study also found that ICT improves the presentation of material in lessons, ICT enhance understanding during lesson presentation, ICT makes teaching more interesting for me and learners, ICT positively changes the relationship between them and their students and that ICT has given them more confidence when teaching. The study further found that ICT makes preparation of lessons to be easy and faster.

5.2.3 ICT Integration in Examination Management

The study sought to establish how if ICT integration in examination management influence the academic performance in public secondary schools in Makueni County. The study found that in most schools have been using computer and its applications for examination management purposes for long. It was also clear that schools greatly use ICT for examination records keeping, examination analysis and for examinations timetabling. Moreover, the study found that schools moderately use ICT for examination setting and for examination moderation. The study further found that ICT integration saves time making it possible to meet deadlines and that ICT integration enhances in-depth analysis of exams.

5.2.4 E-Learning

Further, the study sought to establish how e- learning influences the academic performance in public secondary schools in Makueni County. The study found that computer/tablets and computer lab or library are highly available. The study also revealed that availability of E-books, E-journals and E-modules is doubtful in most schools. The study further revealed that e-learning trainings to teachers and students has not been conducted in most secondary schools. The study also established that E-learning enable you to engage in enquiry-based activities and that E-

learning enable one to participate in assessing his/her work. Moreover, the study found that E-learning enable you to work alone at their own pace.

5.3 Discussion of the Findings

5.3.1 ICT Integration in Administration

The study found that computers, photocopiers were highly available and that printers were highly available highly. Further the study found that that scanners were moderately available and internet was not available. The study also found that the school administration and the staff use ICT in school management daily. The study further revealed that Microsoft word and Microsoft excel were computer programs that were highly available to all departments in the school with internet and email being moderately available. These programs were revealed to have been used daily by school head of departments and examination officers. These findings were in line with Mutisya (2017) who notes that the level of ICT integration is determined by the interplay between the infrastructure, teacher motivation, innovations and development of e-pedagogies. In our world today, ICT has become a vital tool of our day-to-day life and how we do things in our work places.

Further, the study revealed that ICT is used to some extent in preparation and maintenance of staff meetings records, accounting, maintenance of teachers' performance records, personnel management records, student's admission records and record of physical materials. The study also established that ICT is used daily in preparation of school time table and weekly for maintenance of teachers leave and sick-off applications. Further, it was clear that ICT is not used in maintenance of teachers' attendance records and that most schools occasionally use ICT in maintenance of students' discipline records. Moreover, the study established that ICT never used in preparation of departmental time table, in preparation of student' report forms, in maintenance of students' performance records and in preparation of lesson notes. The study also revealed that ICT id never used for preparation of record of work covered and that for preparation of exam records. These findings corelate with Maki (2008) who argues that ICT plays a vital role in supporting powerful efficient management and administration in the education sector and it is specified that technology can be used right from student administration to various resource administrations in an educational institution. However, the growth in the ICT application in schools is not even leading to differences in terms of the level of integration and the influence on

academic performance of the school. Many countries have invested huge amounts of money in ICT in schools, Kenya included.

5.3.2 ICT Integration in Teaching

The study found that most of school staff weekly use mobile phone technology and that don't use Internet while teachers occasionally use power point presentations. The study also found that ICT improves the presentation of material in lessons, ICT enhance understanding during lesson presentation, ICT makes teaching more interesting for me and learners, ICT positively changes the relationship between them and their students and that ICT has given them more confidence when teaching. The study further found that ICT makes preparation of lessons to be easy and faster. These findings correlate with Roberts and Sikes (2011) who argues that modern teaching require educators to present a more efficient and modern instructional management to equip students with knowledge and skills that stimulate creativity and spur growth. this why the information and communication technologies (ICTs) have become rather deeply rooted in educational settings. Their use has fostered qualitative changes in how teaching is approached, especially in terms of presenting contents audio visually, where PowerPoint is the most often used tool, use of internet and also use of mobile phone technology.

5.3.3 ICT Integration in Examination Management

The study found that in most schools have been using computer and its applications for examination management purposes for long. It was also clear that schools greatly use ICT for examination records keeping, examination analysis and for examinations timetabling. Moreover, the study found that schools moderately use ICT for examination setting and for examination moderation. The study further found that ICT integration saves time making it possible to meet deadlines and that ICT integration enhances in-depth analysis of exams. These findings agree with Tusubira, (2005) who articulates that any modern institution of higher learning is critically dependent on the smooth operation of the new innovations of Information and Communication Technology. It is this trend that Kenya as a country has embarked on for the past period. Supported in its entirety by the communication technology, information spread become faster and cheaper. Currently, Kenyan government has introduced the use of ICT where National examination results of individual students are made available on the Web site.

5.3.4 E-Learning

The study found that computer/tablets and computer lab or library are highly available. The study also revealed that availability of E-books, E-journals and E-modules is doubtful in most schools. The study further revealed that e-learning trainings to teachers and students has not been conducted in most secondary schools. The study also established that E-learning enable you to engage in enquiry-based activities and that E-learning enable one to participate in assessing his/her work. Moreover, the study found that E-learning enable you to work alone at their own pace. These findings correspond to Sibanda (2014) who observed that e-learning has become a pillar of success in higher education as it enhances the quality of teaching and learning. A positive relationship exists between the use of learning technology and student engagement and desired learning outcomes. However, high attrition rates emanating from online learning have been of concern to educators worldwide Studies have been conducted on student preference for online learning versus face-to-face learning, albeit without cross-cutting conclusions. Students prefer face-to-face learning to acquire conceptual knowledge in the subject matter, while online learning is preferred in acquiring self-regulated learning skills.

5.4 Conclusions

The study concluded that ICT integration in administration positively and significantly influences academic performance of public secondary schools in Makueni County. It was revealed that computers, photocopiers were highly available. The study also found that the school administration and the staff use ICT in school management daily where Microsoft word and Microsoft excel were computer programs that were highly available to all departments in the school. Further, the study revealed that ICT is used to some extent in preparation and maintenance of staff meetings records, accounting, maintenance of teachers' performance records, personnel management records, student's admission records and record of physical materials. In most schools it was clear that ICT is not used in maintenance of teachers' attendance records and that most schools occasionally use ICT in maintenance of students' discipline records and in preparation of lesson notes.

The study concluded that ICT integration in teaching positively and significantly influences the academic performance in public secondary schools in Makueni County. The study deduced that ICT improves the presentation of material in lessons, ICT enhance understanding during lesson

presentation, ICT makes teaching more interesting for me and learners, ICT positively changes the relationship between them and their students and that ICT has given them more confidence when teaching. The study further found that ICT makes preparation of lessons to be easy and faster.

The study concluded that ICT integration in examination management influence the academic performance in public secondary schools in Makueni County significantly. This was as a result of the fact that in most schools have been using computer and its applications for examination management purposes for long. It was also clear that schools greatly use ICT for examination records keeping, examination analysis and for examinations timetabling. The study further found that ICT integration saves time making it possible to meet deadlines and that ICT integration enhances in-depth analysis of exams.

Further, the study concluded that e- learning influences the academic performance in public secondary schools in Makueni County positively and significantly. The study deduced that availability of E-books, E-journals and E-modules is doubtful in most schools. The study further revealed that e-learning trainings to teachers and students has not been conducted in most secondary schools. The study also established that E-learning enables you to engage in enquiry-based activities and that E-learning enable one to participate in assessing his/her work. Moreover, the study found that E-learning enable you to work alone at their own pace.

5.4 Recommendations of the Study

There is need for the Secondary schools to invest more in computers and related technology as means of not only solving accessibility problem but improving on the presence of the facilities especially computers in the classroom and computer lab. More infrastructures: printers, computers, projectors should be put in place for more practice and utilization.

There is a need to maintain internet connection in the secondary schools and connect more computers to the internet. The secondary schools should then liberalize accessibility of internet and e-mail in the institution in form of establishment of ICT resource centers where all software can be accessed, students‟ packages and all versions of technology. All in all, the secondary schools should take time and even provide a 1:1 ratio of Student - ICT access to facilities thus students should also endeavor to acquire themselves what can be afforded or visit commercial ICT providers like internet café to access ICT facilities.

There is the need to sensitize teachers to be innovative in their work particularly on the use of the cell phone which they widely use in their day to day activities. The cell phone can be a very versatile tool for accessing internet information. Indeed, this tool can be used with ease for classroom instruction. Through the cell phone, teachers can acquire information which may not be readily available through other sources. Teachers can also access latest information using the cell phone. The cell phone can be very useful to those teachers who say that they cannot adopt ICT in teaching because ICT resources are missing or there is lack of power in their schools. A good thing with cell phones is that internet charges via these phones are very low. Teachers can easily bear the cost as the information they access is beneficial first and foremost to them as it equips them with information they can use to assist them in their work. The information can also assist them to raise their competence in their professional life.

Teachers should be encouraged to use a variety of learning resources as well as increase the frequency of use of the resources in teaching and learning. The Ministry of Education can take the role of sensitizing teachers on the need to use learning resources when delivering the curriculum to learners. One forum that the ministry can use is through organizing subject symposia and workshops in different subjects which can also be used to equip teachers with skills on the use of learning resources in their respective classes.

School heads should ensure that their schools are equipped with the necessary teaching and learning resources for the teaching/learning. At the same time, principals should encourage their teachers to attend in-service training particularly on teaching methodology. Principals should also support teachers financially to attend such training opportunities through providing transport, daily subsistence (per diem) and night-out allowances.

The content of training opportunities like symposia and workshops should be scrutinized and areas of weakness identified and strengthened. Issues like whether in such training session's teachers are taught on techniques of meaningful teaching and learning, or whether it is all about making students pass examinations should be scrutinized. Such issues should be resolved to ensure that students benefit from the teaching/learning experience.

5.5 Suggestion for Further Research

Since this was limited to Makueni county, the study recommends that the same study should be done to cover all the counties in Kenya. The study also recommends that the same study should

be done to uncover other factors that contributed the unexplained 26.7% of the variation in academic performance of public secondary schools in Makueni County

The study further recommends another study to be done on influence of ICT integration on performance in mathematics in public secondary schools. Other studies can also be done on students' perception and use of the internet as a hub for learning and the effect of modern technology on students' performance.

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APPENDICES

Appendix I : A Letter to the Respondent.

A LETTER TO THE RESPONDENTS

PETER MWANGI MWILULI,
UNIVERSITY OF NAIROBI,
DEPARTMENT OF OPEN LEARNING,
MACHAKOS BRANCH.

15th May, 2018.

Dear respondents,

REF: RESEARCH UNDERTAKING

I am a student of university of Nairobi pursuing a master's degree in project planning and management researching on effects of ICT integration on academic performance of secondary schools in Kenya. I have chosen Makueni County as my study area. I wish to kindly request you to help me by filling in this questionnaire to the best of your knowledge by putting a tick against your correct choice.

Wishing you God's grace.

Thank you in advance.

Yours faithfully,

……

Peter Mwangi Mwiluli.

Appendix II : Questionnaire

Questionnaire for the Principals

This questionnaire is designed to collect information on ICT integration in public secondary schools and determine how it influences academic performance in Makueni County. Kindly take your time to answer the questions as honestly and truthfully as possible.

The information collected in this questionnaire will be used solely for the intended purpose and therefore any response or information given will be treated with utmost confidence.

Section A: Demographic characteristics of respondents.

1. Gender: Male ☐ Female ☐
2. Education background

   Certificate ☐

   Diploma ☐

   Bachelor degree ☐

   Post-graduate degree ☐

   Other ☐

3. What is your age group?

   18-23 ☐

   24-29 ☐

   30-35 ☐

   36-40c ☐

   41 and above ☐

4 .What is the type of your school?

Boys boarding ☐

Girls' boarding ☐

Mixed boarding ☐

Mixed day ☐

Section B: ICT Integration in Administration and Management of Public Secondary.

5.The following is a list of ICT resources which are key to effective school administration. Using a tick Indicate the extent of their availability.

Use the scale below.

Highly available, 4

Moderately available, 3

Not sure, 2

Not available 1

S/NO	ICT resources	4	3	2	1
1	Computers				
2	Scanners				
3	Photocopiers				
4	Internet				
5	Printers				

6. How often do you use ICT in school management?

On daily basis 4

Twice a week 3

Once a month 2

Never 1

7. The following is a list of computer programs that should be available in a secondary school administration setting.

Using the scale given below, tick the extent of their availability to different departments in the school.

Using a scale of 1-5, where;

Highly available 4

Moderately available [3]

Not sure [2]

Not available [1]

S/NO.	Computer programs	4	3	2	1
(a)	Microsoft word and Microsoft excel.				
(b)	Internet and email.				

8. Using the scale below, indicate the extent to which the school management uses ICT in the following areas,

Using a scale of 1 to 5 where:

Great Extent, [5]

Some Extent, [4]

Undecided, [3]

Less Extent, [2]

No Extent. [1]

S/NO	ICT integration	5	4	3	2	1
1	Accounting					
2	Personnel management records.					
3	Students admission records					
4	Maintenance of BOM records.					
5	Maintenance of teachers performance records					
6	Record of physical materials					

7	Preparation and maintenance of staff meetings records					

Section C: ICT integration in teaching.

How often do you use the following during lesson delivery,

Kindly indicate your level of agreement with each by ticking against the correct choice.

Using a scale 1-5

Daily 5

Weekly 4

Not sure 3

Occasionally 2

Never. 1

S/NO.	Use of ICT resources.	5	4	3	2	1
1	Internet					
2	Power point presentations					
3	Mobile phone technology					

Using a scale of 1-5 given below, give your opinion on the influence of using ICT in the teaching process:

Tick one box,

Using a scale of 1-5, where;

Strongly agree 5

Agree 4

Neutral 3

Disagree 2

Strongly disagree. 1

S/NO	Influence of ICT integration in the lesson.	5	4	3	2	1
1	ICT enhance understanding during lesson presentation.					
2	ICT makes teaching more interesting for me and learners.					
3	ICT makes preparation of lessons to be easy and faster.					
4	ICT improves the presentation of material in my lessons.					
5	ICT has given me more confidence when teaching					
6	ICT positively changes the relationship between me and my students					

Section D: ICT integration in examination management.

1. How long have you been using computer and it's applications for examination management purposes?

Never used ……..

less than one year…….

One year ……

More than two years…….

2. Indicate the extent to which the examination department management uses ICT in the following areas,

Using a scale of 1-5 where: Using a scale of 1-5, where;

Great extent 5

Some extent 4

Undecided 3

Less extent [2]

Never. [1]

S/NO.	ICT use	5	4	3	2	1
1	Examination analysis.					
2	Examination moderation,					
3	Examination setting.					
4	Examinations timetabling.					
5	Examination records keeping. .					

3.Using a scale of 1-5 given below, give your opinion on the influence of using ICT in examination management process:

Tick one box,

Using a scale of 1-5, where;

Strongly agree [5]

Agree [4]

Neutral [3]

Disagree [2]

Strongly disagree. [1]

S/NO.	Influence of ICT integration on examination management.	5	4	3	2	1
1	ICT integration saves time making it possible to meet deadlines.					

2	ICT integration make enhances in-depth analysis to be done.					

Section E: e-learning.

1. The following is a list of e-learning resources which are key to effective teaching and learning.. Using a tick Indicate the extent of their availability.

Use the scale below.

Highly available, 4

Moderately available, 3

Not sure, 2

Not available 1

S/NO	e-learning resource	4	3	2	1
1	Computer/tablets				
2	e-books				
3	e-journals				
4	e-modules				
5	Computer lab/library				

2.How often does your school conduct e-learning trainings to teachers and students?

Using the scale1-5,tick one box.

Always 5

Often 4

At times 3

Rarely 2

Never 1

3.Kindly indicate your level of agreement with each of the following statements by ticking against the correct choice.

Using a scale 1-5

Strongly agree 5

4

Agree

Neutral [3]

Disagree [2]

Strongly disagree. [1]

S/NO.	**Influence of e-learning to learners.**	5	4	3	2	1
1	e-learning enable you to work alone at your own pace.					
2	e-learning enable you to engage in enquiry-based activities.					
3	e-learning enable one to participate in assessing his/her work.					

Section F: ICT Influence on KCSE performance.

1. To what extent do you agree with each of the following statement on how ICT integration influence KCSE performance in your school.

Using a scale of 1-5, where;

Strongly agree [5]

Agree [4]

Neutral [3]

Disagree [2]

Strongly disagree. [1]

S/NO	**Influence of ICT Integration on KCSE.**	**5**	**4**	**3**	**2**	**1**
1	It enhances faster syllabus coverage there by better performance.					
2	More quality grades of C+ and above.					
3	Enhances better understanding leading to few wastage grades i.e D plain and below.					

THANKS AND BE BLESSED.

Appendix III : Questionnaire for Deputy Principals

This questionnaire is designed to collect information on ICT integration in public secondary school and determine how it influences academic performance in Makueni County. Kindly take your time to answer the questions as honestly and truthfully as possible.

The information collected in this questionnaire will be used solely for the intended purpose and therefore any response or information given will be treated with utmost confidence.

Section A: Demographic characteristics of respondents.

4. Gender: Male ☐ Female ☐

5. Education background

   Certificate ☐

   Diploma ☐

   Bachelor degree ☐

   Post-graduate degree ☐

   Other specify ☐

6. What is your age group?

   18-23 ☐

   24-29 ☐

   30-35 ☐

   36-40c ☐

   41 and above ☐

4 .What is the type of your school?

(a) Boys boarding ☐

(b) Girls' boarding ☐

(c) Mixed boarding ☐

(d) Mixed day ☐

Section B: How Deputy Principals' use ICT and its integration in school administration

The following is a list of ICT resources which are key to effective school administration. Using a tick Indicate the extent of their availability.

Use the scale below.

Highly available, 4

Moderately available, 3

.Not sure, 2

Not available 1

S/NO	ICT resources	4	3	2	1
1	Computers				
2	Scanners				
3	Photocopiers				
4	Internet				
5	Printers				

The following are some of the administrative tasks involving students and teachers in your school. Using the scale provided below, indicate by ticking how frequently you use ICT to perform the following administrative tasks:

Using a scale of 1-5, where;

Daily 5

Weekly 4

Not sure 3

Occasionally. 2

Never. 1

S/NO	ICT integration	5	4	3	2	1
1	Preparation of school time table					
2	Maintenance of students' discipline records					
3	Preparation of lesson notes, lesson plans record of work					
4	Maintenance of teachers' attendance records					
5	Maintenance of teachers leave and sick-off applications					

Section C: ICT integration in teaching.

How often do you use the following during lesson delivery,

Kindly indicate your level of agreement with each by ticking against the correct choice.

Using a scale 1-5

Daily 5

Weekly 4

Not sure 3

Occasionally 2

Never. 1

S/NO.	**Use of ICT resources.**	**5**	**4**	**3**	**2**	**1**
1	Internet					
2	Power point presentations					
3	Mobile phone technology					

Using a scale of 1-5 given below, give your opinion on the influence of using ICT in the teaching process:

Tick one box,

Using a scale of 1-5, where;

Strongly agree 5

Agree 4

Neutral 3

Disagree [2]

Strongly disagree. [1]

S/NO	Influence of ICT integration in the lesson.	5	4	3	2	1
1	ICT enhance understanding during lesson presentation.					
2	ICT makes teaching more interesting for me and learners.					
3	ICT makes preparation of lessons to be easy and faster.					
4	ICT improves the presentation of material in my lessons.					
5	ICT has given me more confidence when teaching					
6	ICT positively changes the relationship between me and my students					

Section D: ICT integration in examination management.

1. How long have you been using computer and it's applications for examination management purposes?

Never used ……..

less than one year…….

One year ……

More than two years…….

2. Indicate the extent to which the examination department management uses ICT in the

following areas,

Using a scale of 1-5 where: Using a scale of 1-5, where;

Great extent 5

Some extent 4

Undecided 3

Less extent 2

Never. 1

S/NO.	ICT use	5	4	3	2	1
1	Examination analysis.					
2	Examination moderation,					
3	Examination setting.					
4	Examinations timetabling.					
5	Examination records keeping.					

3.Using a scale of 1-5 given below, give your opinion on the influence of using ICT in examination management process:

Tick one box,

Using a scale of 1-5, where;

Strongly agree 5

Agree 4

Neutral 3

Disagree 2

Strongly disagree. 1

S/NO.	Influence of ICT integration on examination management.	5	4	3	2	1
1	ICT integration saves time making it possible to meet deadlines.					
2	ICT integration enhances in-depth analysis of exams.					

Section E: e-learning.

1. The following is a list of e-learning resources which are key to effective teaching and learning..

Using a tick Indicate the extent of their availability.

Use the scale below.

Highly available, [4]

Moderately available, [3]

Not sure, [2]

Not available [1]

S/NO	e-learning resource	4	3	2	1
1	Computer/tablets				
2	e-books				
3	e-journals				
4	e-modules				
5	Computer lab/library				

2.How often does your school conduct e-learning trainings to teachers and students?

Using the scale1-5,tick one box.

Always [5]

Often [4]

At times [3]

Rarely [2]

Never [1]

3.Kindly indicate your level of agreement with each of the following statements by ticking against the correct choice.

Using a scale 1-5

Strongly agree [5]

Agree [4]

Neutral [3]

Disagree [2]

Strongly disagree. [1]

	Influence of e-learning to learners.	5	4	3	2	1
1	e-learning enable you to work alone at your own pace.					
2	e-learning enable you to engage in enquiry-based activities.					
3	e-learning enable one to participate in assessing his/her work.					

Section F: ICT Influence on KCSE performance.

1.To what extent do you agree with each of the following statement on how ICT integration influence KCSE performance in your school.

Using a scale of 1-5, where;

Strongly agree [5]

Agree [4]

Neutral [3]

Disagree [2]

Strongly disagree. [1]

S/NO	Influence of ICT Integration on KCSE.	5	4	3	2	1
1	It enhances faster syllabus coverage there by better performance.					
2	More quality grades of C+ and above.					
3	Enhances better understanding leading to few wastage grades i.e D plain and below.					

THANKS AND BE BLESSED

Appendix IV : Questionnaire for Head of Departments

This questionnaire is designed to collect information on ICT integration in public secondary schools and determine how it influences academic performance in Makueni County. Kindly take your time to answer the questions as honestly and truthfully as possible.

The information collected in this questionnaire will be used solely for the intended purpose and therefore any response or information given will be treated with utmost confidence.

Section A: Demographic characteristics of respondents.

1. Gender: Male ☐ Female ☐
2. Education background
   - Certificate ☐
   - Diploma ☐
   - Bachelor degree ☐
   - Post-graduate degree ☐
   - Other ☐
3. What is your age group?
   - 18-23 ☐
   - 24-29 ☐
   - 30-35 ☐
   - 36-40c ☐
   - 41 and above ☐

4 .What is the type of your school?

Boys boarding ☐

Girls' boarding ☐

Mixed boarding ☐

Mixed day ☐

Section B: How H.O.DS' use ICT and its integration in school administration

1. The following are some of the administrative tasks involving students and teachers in your school. Using a tick, indicate how frequently you perform the following administrative tasks.

1. Always.

2.Occationally,

3.Not sure,

4.Rarely,

5.Never

S/NO	Administrative tasks	5	4	3	2
1	Preparation of school time table.				
2	Preparation of student' report forms.				
3	Maintenance of students' performance records.				
4	Preparation of lesson notes.				

The following is a list of computer programs available in a secondary school administration setting. Using the scale below, indicate by ticking the extent to which you use them in management of your department.

Using a scale of 1-5, where;

Daily ☐ 5

Weekly ☐ 4

Not sure ☐ 3

Occasionally. 2

Never. 1

S/NO	Computer programs	5	4	3	2	1
1	Microsoft word					
2	Microsoft excel					
3	Internet and email					
4	Microsoft power point					

Section C: ICT integration in teaching.

1.How often do you use the following during lesson delivery,

Kindly indicate your level of agreement with each by ticking against the correct choice.

Using a scale 1-5

Daily 5

Weekly 4

Not sure 3

Occasionally 2

Never. 1

S/NO.	Use of ICT resources.	5	4	3	2	1
1	Internet					
2	Power point presentations					
3	Mobile phone technology					

2.Using a scale of 1-5 given below, give your opinion on the influence of using ICT in the teaching process:

Tick one box,

Using a scale of 1-5, where;

Strongly agree [5]

Agree [4]

Neutral [3]

Disagree [2]

Strongly disagree. [1]

S/NO	Influence of ICT integration in the lesson.	5	4	3	2	1
1	ICT enhance understanding during lesson presentation.					
2	ICT makes teaching more interesting for me and learners.					
3	ICT makes preparation of lessons to be easy and faster.					
4	ICT improves the presentation of material in my lessons.					
5	ICT has given me more confidence when teaching					
6	ICT positively changes the relationship between me and my students					

Section D: ICT integration in examination management.

1. How long have you been using computer and it's applications for examination management purposes?

Never used ……..

Less than one year…….

One year ……

More than two years…….

2. Indicate the extent to which the examination department management uses ICT in the following areas,

Using a scale of 1-5 where: Using a scale of 1-5, where;

Great extent 5

Some extent 4

Undecided 3

Less extent 2

Never. 1

S/NO.	**ICT use**	**5**	**4**	**3**	**2**	**1**
1	Examination analysis.					
2	Examination moderation,					
3	Examination setting.					
4	Examinations timetabling.					
5	Examination records keeping.					

3.Using a scale of 1-5 given below, give your opinion on the influence of using ICT in examination management process:

Tick one box,

Using a scale of 1-5, where;

Strongly agree 5

Agree 4

Neutral 3

Disagree 2

Strongly disagree. 1

S/NO.	Influence of ICT integration on examination management.	5	4	3	2	1
1	ICT integration saves time making it possible to meet deadlines.					
2	ICT integration enhances in-depth analysis to be done.					

Section E: e-learning.

1. The following is a list of e-learning resources which are key to effective teaching and learning..

Using a tick Indicate the extent of their availability.

Use the scale below.

Highly available, 4

Moderately available, 3

Not sure, 2

Not available 1

S/NO	e-learning resource	4	3	2	1
1	Computer/tablets				
2	e-books				
3	e-journals				
4	e-modules				
5	Computer lab/library				

2. How often does your school conduct e-learning trainings to teachers and students?

Using the scale1-5,tick one box.

Always [5]

Often [4]

At times [3]

Rarely [2]

Never [1]

3.Kindly indicate your level of agreement with each of the following statements by ticking against the correct choice.

Using a scale 1-5

Strongly agree [5]

Agree [4]

Neutral [3]

Disagree [2]

Strongly disagree. [1]

	Influence of e-learning to learners.	5	4	3	2	1
1	e-learning enable you to work alone at your own pace.					
2	e-learning enable you to engage in enquiry-based activities.					
3	e-learning enable one to participate in assessing his/her work.					

Section F: ICT Influence on KCSE performance.

1. To what extent do you agree with each of the following statement on how ICT integration influences KCSE performance in your school.

Using a scale of 1-5, where;

Strongly agree 5

Agree 4

Neutral 3

Disagree 2

Strongly disagree. 1

S/NO	Influence of ICT Integration on KCSE.	5	4	3	2	1
1	It enhances faster syllabus coverage there by better performance.					
2	Enhances more quality grades of C+ and above.					
3	Enhances better understanding leading to few wastage grades i.e D plain and below.					

THANKS AND BE BLESSED

Appendix V : Questionnaire for Teachers

This questionnaire is designed to collect information on ICT integration in public secondary schools and determine how it influences academic performance in Makueni County. Kindly take your time to answer the questions as honestly and truthfully as possible.

The information collected in this questionnaire will be used solely for the intended purpose and therefore any response or information given will be treated with utmost confidence.

Section A: Demographic characteristics of respondents.

1. Gender: Male ☐ Female ☐
2. Education background

   Certificate ☐

   Diploma ☐

   Bachelor degree ☐

   Post-graduate degree ☐

   Other ☐

3. What is your age group?

   18-23 ☐

   24-29 ☐

   30-35 ☐

   36-40c ☐

   41 and above ☐

4 .What is the type of your school?

Boys boarding ☐

Girls' boarding ☐

Mixed boarding ☐

Mixed day ☐

Section B: How Teachers use ICT and its integration in school administration

1. The following are some of the administrative tasks involving students and teachers in your school. Using a tick, indicate how frequently you integrate ICT to perform the following administrative tasks.

1. Always.

2.Occationaly,

3.Not sure,

4.Rarely,

5.Never

S/NO	**Administrative tasks**	**5**	**4**	**3**	**2**	1
1	Preparation of personal time table.					
2	Preparation of student' report forms.					
3	Maintenance of students' performance records.					
4	Preparation of record of work covered.					

2.The following is a list of computer programs available in a secondary school administration setting. Using the scale below, indicate by ticking the extent to which you use them in management of your department.

Using a scale of 1-5, where;

Daily ☐ 5

Weekly ☐ 4

Not sure ☐ 3

Occasionally. ☐ 2

Never. [1]

S/NO	Computer programs	5	4	3	2	1
1	Microsoft word					
2	Microsoft excel					
3	Internet and email					

Section C: ICT integration in teaching.

1.How often do you use the following during lesson delivery,

Kindly indicate your level of agreement with each by ticking against the correct choice.

Using a scale 1-5

Daily [5]

Weekly [4]

Not sure [3]

Occasionally [2]

Never. [1]

S/NO.	Use of ICT resources.	5	4	3	2	1
1	Internet					
2	Power point presentations					
3	Mobile phone technology					

2.Using a scale of 1-5 given below, give your opinion on the influence of using ICT in the teaching process:

Tick one box,

Using a scale of 1-5, where;

Strongly agree [5]

Agree [4]

Neutral 3

Disagree 2

Strongly disagree. 1

S/NO	Influence of ICT integration in the lesson.	5	4	3	2	1
1	ICT enhance understanding during lesson presentation.					
2	ICT makes teaching more interesting for me and learners.					
3	ICT makes preparation of lessons to be easy and faster.					
4	ICT improves the presentation of material in my lessons.					
5	ICT has given me more confidence when teaching					
6	ICT positively changes the relationship between me and my students					

Section D: ICT integration in examination management.

1. How long have you been using computer and it's applications for examination management purposes?

Never used ……..

Less than one year…….

One year ……

More than two years…….

2. Indicate the extent to which the examination department management uses ICT in the following areas,

Using a scale of 1-5 where: Using a scale of 1-5, where;

Great extent [5]

Some extent [4]

Undecided [3]

Less extent [2]

Never. [1]

S/NO.	ICT use	5	4	3	2	1
1	Examination analysis.					
2	Examination moderation,					
3	Examination setting.					
4	Examinations timetabling.					
5	Examination records keeping. .					

3.Using a scale of 1-5 given below, give your opinion on the influence of using ICT in examination management process:

Tick one box,

Using a scale of 1-5, where;

Strongly agree [5]

Agree [4]

Neutral [3]

Disagree [2]

Strongly disagree. [1]

S/NO.	Influence of ICT integration on examination management.	5	4	3	2	1
1	ICT integration saves time making it possible to meet deadlines.					
2	ICT integration enhances in-depth analysis to be done.					

Section E: e-learning.

1. The following is a list of e-learning resources which are key to effective teaching and learning.. Using a tick Indicate the extent of their availability.

Use the scale below.

Highly available, 4

Moderately available, 3

Not sure, 2

Not available 1

S/NO	e-learning resource	4	3	2	1
1	Computer/tablets				
2	e-books				
3	e-journals				
4	e-modules				
5	Computer lab/library				

2. How often does your school conduct e-learning trainings to teachers and students?

Using the scale1-5,tick one box.

Always 5

Often 4

At times 3

Rarely 2

Never 1

3.Kindly indicate your level of agreement with each of the following statements by ticking against the correct choice.

Using a scale 1-5

Strongly agree 5

Agree 4

Neutral 3

Disagree 2

Strongly disagree. 1

	Influence of e-learning to learners.	5	4	3	2	1
1	e-learning enable you to work alone at your own pace.					
2	e-learning enable you to engage in enquiry-based activities.					
3	e-learning enable one to participate in assessing his/her work.					

Section F: ICT Influence on KCSE performance.

1. To what extent do you agree with each of the following statement on how ICT integration influences KCSE performance in your school.

Using a scale of 1-5, where;

Strongly agree 5

Agree 4

Neutral 3

Disagree 2

Strongly disagree. 1

S/NO	Influence of ICT Integration on KCSE.	5	4	3	2	1
1	It enhances faster syllabus coverage there by better performance.					
2	Enhances more quality grades of C+ and above.					
3	Enhances better understanding leading to few wastage grades i.e D plain and below.					

THANKS AND BE BLESSED

Appendix VI : Introduction Letter From the University

UNIVERSITY OF NAIROBI
OPEN, DISTANCE & e-LEARNING CAMPUS
SCHOOL OF OPEN & DISTANCE LEARNING
DEPARTMENT OF OPEN LEARNING
KITUI LEARNING CENTRE

Telegram: ''VARSITY'' NAIROBI
Telephone: 245-020-318262
Telex: 28520Varsity KE

P.O Box 30197 NAIROBI
NAIROBI, KENYA
e-mail: acadreg@uonbi.ac.ke

RE:PETER MWANGI MWILULI REG/NO:L50/61622/2011

The above named is a student at University of Nairobi, Open, Distance and e-Learning Campus, School of Open and Distance Learning, Department of Open Learning. He is undertaking his Degree Master of Arts in Project Planning and Management. We authorize him to carry out his research on **(Influence of ICT integration on academic performance of public secondary schools in Kenya: A case of Makueni County**.)

Any assistance accorded to him is highly appreciated by this Department to enable him compile final document.

Thanks.

UNIVERSITY OF NAIROBI
MACHAKOS EMC
Date: 28/6/2018
P. O. Box 30197, NAIROBI
MACHAKOS LEARNING CENTRE

MR. MUMO MUEKE
Centre CordinatorKitui /Machakos Learning Centre
mumomueke@yahoo.com 0722621411

Appendix VII : Authorization Letter From the County Commissioner.

THE PRESIDENCY
MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

Telegram:
Telephone: 0743-987-177
Fax:
Email: *makueniccc@yahoo.com*

COUNTY COMMISSIONER
MAKUENI COUNTY
P.O. Box 1-90300
MAKUENI

Ref: MKN/CC/ADM.6/1 VOL.III/65

9th August, 2018

Peter Mwangi Mwiluli
University of Nairobi
P.O. Box 30197 - 00100
NAIROBI

RE: RESEARCH AUTHORIZATION

Reference is made to Director General National Commission for Science Technology and Innovation letter **Ref. NACOSTI/P/18/84196/24101**dated **24th July, 2018** on the above subject.

You are hereby authorized to undertake research on ***"Influence of ICT integration on academic performance of public secondary schools in Kenya"*** for the period ending ***24th July 2019***.

09 AUG 2018

AGNES N. KEEMPUA
FOR: COUNTY COMMISSIONER
MAKUENI

c.c.

County Director of Education
MAKUENI

The Deputy County Commissioner
KILUNGU SUB COUNTY

Appendix VIII : Authorization Letter From the County Director of Education.

REPUBLIC OF KENYA

Tel: 044-33318
FAX: @gmail.com
Email:cdemakueni@gmail.com
When replying please quote

County Director of Education
Office,
P.O. Box 41,
MAKUENI.

MINISTRY OF EDUCATION

STATE DEPARTMENT OF EARLY LEARNING AND BASIC EDUCATION

MKN/C/ED/5/33 VOL 11/105 **9th August, 2018**

Peter Mwangi Mwiluli
University of Nairobi
Box 30197-00100
NAIROBI.

TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION FOR PETER MWANGI MWILULI

This is to confirm that Peter Mwangi Mwiluli of University of Nairobi has been authorized to carry out research as per letter dated **24th July,2018,** Ref **No. NACOSTI/P/18/84196/24101** on **"Influence of ICT integration on academic performance of public secondary schools in Kenya; a Case study of Makueni County, Kenya,"** for the period ending **24th July, 2019.**

You are however expected to ensure that you conduct the exercise professionally.

Kindly give him all the assistance required.

Gladys Malonza

For County Director of Education

Makueni.

COUNTY DIRECTOR OF EDUCATION
DATE: 9/8/18
P.O. BOX 41-90300
MAKUENI
MAKUENI COUNTY - MOEST

ISO 9001 BUREAU VERITAS Certification

-

Appendix IX. Research Permit From NACOSTI

THIS IS TO CERTIFY THAT:
MR. PETER MWANGI MWILULI
of UNIVERSITY OF NAIROBI,
17387-20100 NAKURU,has been
permitted to conduct research in
Makueni County

on the topic: ***INFLUENCE OF ICT INTEGRATION ON ACADEMIC PERFORMANCE OF PUBLIC SECONDARY SCHOOLS IN KENYA;A CASE OF MAKUENI COUNTY***

for the period ending:
24th July,2019

.....
Applicant's Signature

Permit No : NACOSTI/P/18/84196/24101
Date Of Issue : 24th July,2018
Fee Recieved :Ksh 1000

.....
Director General
National Commission for Science, Technology & Innovation

Appendix X;Authorization Letter From NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/18/84196/24101**

Date: **24th July, 2018**

Peter Mwangi Mwiluli
University of Nairobi
P.O Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Influence of ICT integration on academic performance of public secondary schools in Kenya; a case of Makueni County"*** I am pleased to inform you that you have been authorized to undertake research in **Makueni County** for the period ending **24th July, 2019.**

You are advised to report to **the County Commissioner and the County Director of Education, Makueni County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Makueni County.

The County Director of Education
Makueni County.

Appendix XI : Turnitin Report

INFLUENCE OF ICT INTEGRATION ON ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN KENYA.A CASE OF MAKUENI COUNTY.

ORIGINALITY REPORT

10%	5%	3%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	N. Arumugam, M.A. Fatimah, E.F.C. Eddie FC Chiew, M. Zainalabidin. "Supply chain analysis of fresh fruits and vegetables (FFV): Prospects of contract farming", Agricultural Economics (Zemědělská ekonomika), 2010 Publication	<1%
2	Submitted to Sunway Education Group Student Paper	<1%
3	www.nurru.or.ug Internet Source	<1%
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