A COMPARATIVE STUDY OF AVAILABILITY OF E-LEARNING RESOURCES AND PUPILS' PERFORMANCE IN SELECTED PRIMARY SCHOOLS IN KISUMU CENTRAL AND MUHORONI SUB COUNTIES, KENYA

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A thesis submitted to the Graduate School in partial fulfilment for the requirements of the Master of Education degree in Educational Foundations of Egerton University

EGERTON UNIVERSITY

APRIL 2019

DECLARATION AND RECOMMENDATION

DECLARATION

This thesis is my original work and has not been presented for the award of a degree in this university or any other university.

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DEDICATION

To the Almighty God who gave me the strength and knowledge, my dear wife Janet Anyango, my children Juliet, Jeffrey, Joseph and Joel for inspiring me through the course of this study.

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ABSTRACT

Globally, the integration of Information and Communications Technology (ICT) in education systems has become a practice which studies have shown to significantly influence academic performance. Disparities in pupils' performance in Kenya Certificate of Primary Education (KCPE) have been occurring every year, although some researchers tend to link the same with availability of e-learning resources. This gap has informed the study. Kisumu Central schools' pupils have been performing better than other sub counties in KCPE every year. For example, between 2011 and 2014, Kisumu Central had an overall mean of 278.14 while Muhoroni Sub County had an overall mean of 243.17. While the digital divide between the urban and rural parts of Kenya has not been investigated, its influence on disparities in pupils' performance in KCPE remains unknown. The purpose of this study was to compare availability of e-Learning resources and pupil's in selected primary schools in Kisumu Central and Muhoroni Sub Counties. The objectives of the study were to compare the e-learning resources for instruction; establish the extent of utilization of e-learning devices for instruction, and to evaluate the challenges facing utilization of e-learning resources for instruction among primary schools in Kisumu Central and Muhoroni Sub Counties. Piaget's theory of intellectual development and Holmes' problem solving approach were used to guide the study. The study adopted the ex post facto research design. The population of the study included 104 and 54 primary schools from Kisumu Central and Muhoroni Sub County respectively. Through simple random sampling technique, 10% of the schools (10 in Kisumu Central and 5 in Muhoroni) were sampled. Purposive sampling method was used to select 10 pupils, 2 teachers, and 1 head teacher from each sampled primary school. Questionnaires for teachers and pupils, as well as an observation guide, were used for data collection. Instrument validity was ensured through consultations with the supervisors and lecturers in the Faculty of Education and Community Studies of Egerton University. Instrument reliability was ensured through test retest during a pilot study and a co-efficient of 0.70 obtained. Data was analysed using Statistical Package for Social Sciences version 21. Results revealed that: there is no statistically significant difference in the e-learning resources; there is no statistically significant difference in utilization of e-learning resources, and there is no statistically significant difference in the challenges facing e-learning for instruction by schools between Kisumu Central and Muhoroni Sub Counties. The researcher concludes that disparities in pupils' performance in KCPE are due to other factors and not utilization of e-learning resources in schools from the two regions. It is recommended that e-learning resources that support school curriculum should be procured and utilised with regard to training levels of users. There is also need to build the capacity of teachers so that they are able to use e-learning for instruction. The results of this study are significant in informing the various primary education stakeholders such as head teachers, teachers, school management committees and the Ministry of Education on the benefits of using e-learning for instruction, the challenges teachers and students face in using ICTs and on how to strategize for better use of ICT for instruction for improved academic performance.

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ABBREVIATIONS AND ACRONYMS

ALIN	-	Arid Lands Information Network
ATSS	-	Attitude Towards Science Scale
AVA	-	Audio Visual Aids
AVU	-	African Virtual University
CD	-	Computer Disc
DBRIEF	-	Design Based Research in Innovative Education Framework
DEA	-	Data Envelopment Analysis
DEO	-	District Education Office
DVD	-	Digital Versatile Disc
E –LDI	-	E-Learning Development and Improvement
E –Learning	-	Electronic Learning
EFA	-	Education For All
GeSCI	-	Global e-School and Community Initiative
GOK	-	Government of Kenya
HCD	-	Human Capital Development
ICT	-	Information Communication Technology
IRF	-	Information Responses and Follow up
IST- Africa	-	Information Society of Technologies in Africa
IT	-	Information Technology
KCPE	-	Kenya Certificate of Primary Education
KeLC	-	Kenya e-Learning Centre
KIE	-	Kenya Institute of Education
MAT	-	Multimedia Aided Teaching
MDGs	-	Millennium Development Goals
MoE	-	Ministry of Education
NACOSTI	-	National Commission for Science, Technology and Innovation
NEPAD	-	New Partnership for Africa Development
NGO	-	Non-Governmental Organization
OP	-	Office of The President
PPP	-	Private Public Partnership
ROM	-	Read Only Memory

SPSS	-	Statistical Package for Social Sciences
SCDE		Sub County Director of Education
UNESCO	-	United Nations Educational, Scientific and Cultural Organization
UPE	-	Universal Primary Education
VAT	-	Value Added Tax
WSIS	-	World Summit of Information Society

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CHAPTER ONE

INTRODUCTION

1.1Background of the Study

E-learning offers a great promise as a powerful tool that can be integrated into curriculum and instruction to enhance education (Etherington, 2008). Information and Communication Technologies (ICTs) provide new opportunities for delivering information, and ease communication and resource sharing, apart from challenging educational institutions to integrate them into their curricular and utilize them in diverse ways (Simsek, 2008). Sociologist Bell (1973) observes that the use of ICT has become part and parcel of modern days' life, and appreciates that a bigger percentage of the worlds' population makes use of the utility. Gibbons (1987) also notes that domestically, the use of electronic devices for purposes of information dissemination is evident through mobile phones, television sets, video players and telephone lines. Through the interconnectedness, people are able to get information that flows at nearly the speed of light (Gibbons, 1987). Such access to information at that rate has reduced the world into a global village. Different types of ICTs have been used for given roles in e-Business, e-Health, e-Governance and e-learning both internationally and locally so as to improve efficiency in performance, delivery and hastened intellectual exchange between people of diversified culture (Hainline, 1987).

E-learning has received myriad of definitions. Some related terms that share similar characteristics with e-learning include distributed learning, online learning, web-based learning, distance learning, network learning and technology based learning (Wentling, 2000). Integrating ICT in education is significant to primary education for teaching and learning purposes. Thus, e-learning has become a widely accepted learning module in recent years as attested by Cleole (2001) and Mcpherson (2005). Although there are numerous studies that acknowledge the appropriateness of ICT, they have faced two main difficulties. On one hand, standard performance of students has not been agreed upon and there is still confusion about its definition. On the other, ICT entails evolving technologies and their effects are difficult to isolate from their environment. Consequently, the relationship between the use of ICT and educational performance is unclear, and contradictory results are presented by different authors (Youssef & Dahmani, 2008).

The success of any educational change, like ICT utilization, mainly depends on the availability of e-learning resources, their utilization in respect to teaching and learning, and the teacher preparedness since they are responsible for deciding the medium and the tools through which the educational materials are passed on to students (Gakuu & Kidombo, 2010). Etherington (2008) appreciates that E-learning pedagogy at the primary school level encourages the mind and body to be active in the learning process. However, some studies have revealed that there are situations which tend to impede utilization of e-learning resources, and possibly influencing performance of learners. Rogers (2003) identified five technological characteristics or attributes that influence utilization of e-learning resources: being user characteristics, content characteristics, technological considerations, and organizational capacity as factors influencing ICT adoption and integration into teaching. Equally, Balanskat, Blamire and Kefalla (2007) identified the factors as teacher-level, school-level and system-level. Studies have however not clearly compared availability as well as utilization of ICT resources to performance of learners, particularly among primary schools in different regions.

Evidence is available of teachers having ICT devices in their possessions, although limited information is available with regard to how the same aids performance of learners among schools from different regions. Albirini (2006) employed a questionnaire to collect evidence from high school teachers' view on computer attributes, cultural perceptions, computer competence, computer access, and personal characteristics in England. The result revealed that 57% of the respondents had computers at home and 33.4% had access to computers at school. Similarly, Afshari, Bakar, Luan, Samah, and Fooi (2009) examined factors affecting teachers' use of information and communication technology among 30 public secondary schools in Tehran. The findings revealed that over 50% of the respondents used computers for research and lesson preparation in their schools. About 78% of the respondents complained of inadequate access to computers in classroom. Of this percentage, 38% of the respondents stated that inadequate computers were not great barriers to ICT use in their teaching. However, Albirini (2006) and Afshari et al (2009) have not indicated whether availability of ICT resources among the teachers have enhanced performance among learners.

Utilization of e-learning resources among teachers has also not been linked with performance of learners, particularly among primary schools situated in different geographical locations. Tella, Tella, Toyobo, Adika and Adeyinka (2007) examined Nigeria secondary school teachers' use of e-learning resources and its implications for further development. The results showed that teachers generally have access to ICTs in their various schools except e-mail and Internet because their schools are not connected. Technical support were lacking in the schools and teachers lack of expertise in using ICT was indicated as being the prominent factors hindering teachers readiness and confidence of using ICTs during lesson. In Kenya, Mbugua, Gori, and Tanui (2015) used a survey method to examine integration of e-learning resources in teaching in public secondary schools in Nakuru County, Kenya. They found that ICT facilities were inadequate and teachers had only basic or no ICT skills. Financial constraints and lack of facilities and equipments were some of the challenges teachers faced in integration of ICT in teaching. It is critical to note that both Tella et al (2007) and Mbugua et al (2015) have not compared utilization of e-learning resources with performance of learners in primary schools from different regions.

The first main difficulty scholars have faced is that student performance is hard to observe and there is still confusion about its definition. Secondly, ICT entails evolving technologies and their effects are difficult to isolate from their environment. Consequently, the relationship between the use of ICT and educational performance is unclear, and contradictory results are presented in the literature (Youssef & Dahmani, 2008). However, this study adopts the definition of Zander (2011), that academic performance is measured using a standardized assessment as well as grade point average (GPA) or mean score.

This notwithstanding, performance of students on achievement tests administered within many developing countries suggests that academic achievement is often very low in some regions and high in others (Byamugisha, 2004). The relative poor school performance may be partly explained by the leadership qualities of head teachers, teachers and pupils from school, lack of teacher engagement in the classroom, and other low key performance indicators, including pupil-teacher ratio, pupil-classroom ratio and lack of availability of instructional materials. Glewwe and Kremer (2006), in their assessment of quality of education, found that the quality of education in

developing countries remains far lower than in developed countries despite the huge accomplishments in enhancing the educational quantity in the former, through policies which articulate free education for all.

There has been urgent need to improve knowledge dissemination procedures so as to enhance students' undertakings (ALthobeti, 2013). In order to achieve good results in the performance of learners, integration of electronically motivated learning with the traditional ones is necessary, according to Adjei-Bisa (2011). Although learning institutions may have differences in ICT resource, utilization and challenges, this may however not entirely result into disparities in academic performance of learners since information providing this link has remained scarce.

There have existed regional disparities in performance of learners in Kenya every year, as evident from KCPE examination results. For instance, results obtained from the Ministry of Education (MoE, 2015) for between 2011 and 2014 KCPE examination indicates a big difference in performance between primary schools in Kisumu County. Table 1 present KCPE results for 2011 and 2014 KCPE results for Kisumu County.

Table 1:

KCPE results from 2011 to 2014 for Kisumu County

Code	Sub County	2011	2012	2013	2014	Overall Mean
39701	Kisumu East	247.11	250.67	271.45	255.51	256.19
39702	**Kisumu Central**	**272.6**	**273.47**	**299.04**	**267.46**	**278.14**
39713	Nyando	242.71	252.33	251.52	248.09	248.66
39734	**Muhoroni**	**237.00**	**246.93**	**249.22**	**239.51**	**243.17**
39733	Nyakach	257.45	265.5	261.57	256.77	260.32
39714	Kisumu West	257.63	265.14	265.67	245.4	258.46
39	COUNTY MEAN	252.4	259.00	266.41	252.3	

Source: County Education office Kisumu (2015)

Table 1 illustrates results obtained from the County Director of Education, Kisumu. The performance achieved by pupils in the 6 sub counties is well illustrated. The disparities in performance shown exist despite the fact that the Kenya Government has been posting trained teachers to both regions in proportion to the number of enrolled learners. Similarly, Free Primary Education funds are being disbursed to each

school in proportion to enrollment in each school, to finance education of each child. However, the possession and usage of e-learning resources, and how well prepared schools in these areas are for integrating electronic devices for teaching and learning ought to be established. This study is meant to establish whether the cause of this disparity is related to the difference in e-learning resources, utilization of e-learning for instruction and the challenges faced in utilization e-learning resources for instruction between these two locations.

1.2 Statement of the Problem

Disparities in performance between primary schools from different sub counties in Kisumu County have been occurring in national examination results released at the end of each year. This has been taking place irrespective of the fact that the Kenya government has been providing funds to every primary school for improvement of teaching in order to enhance academic performance. Although some researchers have established that students taught with e-learning resources attain better scores in tests than learners taught without e-learning instructional packages, availability of e-learning resources, usage, and challenges among primary school within sub counties in Kisumu has received scanty consideration. Kisumu Central has registered good performance as opposed to Muhoroni Sub County. In overall, Muhoroni Sub County has continued to perform dismally compared to other sub counties within Kisumu County in KCPE examination. With other factors that may affect performance being catered for the FPE funds, the difference in teaching methodologies, hence differences in test scores, could be attributable to e-learning resource both at home and in schools. Further, there is scanty information on comparative studies carried out to assess the e-learning resources, their extent of use and the challenges facing the application of e-learning for instruction between urban and rural areas in Kenya and therefore this study was set to fill this gap. This study seeks to compare e-learning resources, usage and challenges in instruction and pupils' performance among primary schools in Kisumu Central and Muhoroni Sub Counties.

1.3 Purpose of the Study

The purpose of the study was to compare utilization of e-Learning resources and pupils' performance in selected primary schools in Kisumu Central and Muhoroni Sub Counties, Kenya.

1.4 Objectives of the Study

The study was guided by the following objectives:

i. To compare the e-learning resources for instruction between primary schools in Kisumu Central and Muhoroni Sub Counties.

ii. To establish the extent of utilization of e-learning for instruction in primary schools in Kisumu Central and Muhoroni Sub Counties.

iii. To evaluate the challenges facing utilization e-learning resources for instruction among primary schools in Kisumu Central and Muhoroni Sub Counties.

1.5 Research hypotheses

The following research hypotheses were tested in this study:

i. There is no statistically significant difference in e-learning resources for instruction between primary schools in Kisumu Central and Muhoroni Sub Counties.

ii. There is no statistically significant difference in the use of e-learning resources between primary schools in Kisumu Central and Muhoroni Sub Counties.

iii. There is no statistically significant difference in the challenges faced in E-Learning for Instruction between Primary Schools in Kisumu Central and Muhoroni Sub Counties.

1.6 Significance of the Study

The findings of this study were useful in determining the extent of utilization of e-learning resources especially in primary schools for the purposes of instruction. The level of e-readiness in the schools helped the study in establishing the extent of use of e-learning strategies with the aim of offering appropriate proposals for improving the prevailing situation.

The challenges observed helped in getting a way forward in enhancing e-learning in both rural and urban areas by ensuring that the teachers acquire requisite mastery of new methods and techniques with regard to e-learning resources. The study's findings may help to improve e-learning literacy levels among teachers and learners in primary

schools. This is beneficial to not only the teachers but also the students and the community at large. The implications of the findings in turn help in informing the advancement of the technological trends in relation to education in both rural and urban settings in Kenya.

The study aimed at making recommendations to policy makers and planners such as the Ministry of Education, ICT providers, subject specialists, curriculum developers like KIE, Virtual University and other relevant stakeholders that help foster the adoption of e-learning in the primary school sector for instruction.

1.7 Scope of the Study

The study covered the resources, level of use and challenges facing the utilisation of e-learning for instruction in primary schools in Kisumu Central and Muhoroni Sub Counties. The area of interest was the availability and level use of electronic aided learning to deliver course content for the internalization of the content by the pupils through their interaction with the electronic devices and how this affects their academic performance at school.

1.8 Limitations of the Study

Since the study restricted itself to e-learning resources, utilization, and challenges, the researcher was not able to analyse whether the available resources were used for pedagogy only, rather than other personal or administrative duties. Similarly, since the researcher was not observing the actual use of e-learning, the findings were based on reports from the respondents. Equally, it proved difficult for the researcher to attribute learning outcomes particularly to e-learning resources, utilization, and challenges, given that learning outcomes are normally attributed to many factors. This was seen in the questionnaire filled by the pupils. Lack of e-learning literacy amongst most respondents slowed down the pace of data collection since a lot of explanation was required to enable respondents to understand the questions being presented.

1.9 Assumptions of the Study

In order for this study to proceed according to the set objectives, the following assumptions were made:

i. Utilization of e-learning resources for instruction influences performance of pupils in examinations.

ii. E-learning resources are used for teaching and learning purposes so that academic performance is improved.

iii. Primary schools acquire e-learning resources for the purpose of improving academic performance of pupils.

iv. The researcher further assumed that there were adequate e-learning resources, skilled teachers, and motivated learners who utilise e-learning resources for the improvement of academic performance.

v. All the respondents gave honest responses during data collection.

1.10 Definition of Terms

Challenge: Are issues or matters that work against success or achievement acquisition and utilization of ICTs for instruction in primary schools

Comparative Study: A research study carried out to compare the difference in e-learning resources, utilization, and challenges faced in resource and utilization between primary schools in Kisumu Central and Muhoroni Sub Counties

E-Education: Electronic education. This is the process of acquisition of knowledge, skills and attitudes through the aid of electronic devices. The devices are used to deliver course content in the primary schools.

Effectiveness: The ability for a tool to offer the expected results. In this study it refers to the ability of e-learning to give expected results.

E-Learning Resources: Electronic learning. It refers to web based learning, computer based learning virtual classrooms and digital collaboration. It includes delivery of content via internet, intranet/extranet (LAN/WAN), audio and videotape, satellite broadcast, interactive TV and CD ROM. In the study this refers to the use of electronic devices like computers, radios, projectors and videos among others to learn/teach. It focuses on the influence of these ICT devises on the performance of pupils in KCPE.

E-Readiness: The preparedness of an institution to use electronic devices for learning. This is the availability of the devices for instruction.

Influence: The effect of E-Learning resources on pupil's performance.

Information and communication technologies (ICTs): Refers to technologies that aid the delivery of information enabling the communication process. These include computers, telecommunication and audio-visual systems used for instruction.

Instruction: The action, practice or profession of a teacher. It is the process of teaching in primary schools.

Internet: Interconnected systems of networks that connect computers in different locations and allows exchange of information.

IT-Kids: Information technology for kids. This is a project that aims at the provision of personal computers to children for learning in schools.

Language: The system of communication in speech and in writing that is used by people to express their thoughts, ideas and feelings. In this context it means the mode of instruction basically English and Kiswahili taught as subjects in primary schools.

Performance: Means the act or process of doing a task or an action. The study takes it to mean the outcome of the KCPE exams done by pupils in primary schools.

Rural Areas: Remote regions. Those areas with unstable economic base and lack the facilities enjoyed by those in the urban areas. The people living in these areas cannot afford the expenses of buying and maintaining electronic devises for learning in primary schools.

Smart Schools: Schools engineered to use Information Communication Technologies. These are the few selected schools to be fitted with internet connectivity gadgets for the e- learning process.

Telecommunications: Refers to the transmission of information by wire, radio waves, optical media or electromagnetic system.

Urban Areas: Those areas that are advantaged in terms of facilities and strong economic status. These are places the people living in are well off financially and can afford the expense of buying and maintaining electronic devices for learning in primary schools.

Utilization: Use or usage of e-learning resources to enhance the teaching and learning process in primary schools.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter presents both literature and theoretical review. The literature review is presented in the sequence of the study objectives, and covers studies on ICT utilization and academic performance from across the globe: Europe, Asia, Africa, and Kenya.

2.2 E-Learning Resources

New technological innovations in education such as E-learning, Electronic/Digital libraries and diverse software programmes are appearing at an ever accelerating pace, paralleling the rapid increase of innovations in the general society (Eynon, 2005). The second computer revolution that began in the 1970's witnessed the appearance of the personal computer (Mohnsen, 1995). This is of significance because it opened up the possibilities of bringing computers into the learning institutions starting from primary schools to other institutions of higher learning. The New Training Technologies (NTTs) in education offer avenues for better ICT utilization for learning. NTTs are important because they improve quality of teaching process by increasing learning attractiveness and effectiveness, reduces failure rates and consequently training length and costs as a result of increased retention and also complement lack of education and training opportunities in certain places (Herremans, 1995).

According to Mingaine (2013), the usual teaching and curricula approaches still remain basically unchanged in many schools, while the technology is typically poorly adopted and underused in classrooms. Studies have revealed that most e-learning resources that are possessed both at home and school do not support pupils in enhancing their learning outcomes or their academic performance.

The New Partnership for Africa's Development (NEPAD) encourages the use of ICTs drawn by convergence of computers, telecommunications and traditional media since they are crucial for knowledge-based economy of the future of Africa. NEPAD further observes that rapid advances in technology and the diminishing cost of acquiring the new ICT tools have opened new windows of opportunities for African

countries to accelerate economic growth and development. The objectives of utilising these opportunities are to achieve e-readiness for all countries in Africa and develop and produce a pool of ICT proficient youth and students from which Africa can draw trainees and ICT engineers, programs and software developers. The degree of over-dependence on the West for such technologies is being reduced by the day. The NEPAD Africa conference held in Abuja-Nigeria in the year 2001 suggested a framework for the establishment of training and research institutions to build high-level manpower. During this conference, viable strategies were identified to promote and accelerate existing projects to concrete ICT schools and youth centres (Kinyanjui, 2004). This conference re-affirmed technological advancements as currently given priority in most African countries.

In order to hasten the e-learning initiative in Africa, NEPAD has established The E-Africa Commission with headquarters in South Africa. The commission calls for at least 600,000 primary and secondary schools in Africa to be connected via computer network with an emphasis on science and technology learning materials. The first phase is already being implemented in 20 countries across. The NEPAD e-school also eventually aims at equipping all African schools with radios, television sets, phones, fax machines and digital cameras (Kinyanjui, 2004). The pupils and students learning in these e-schools will have an opportunity to utilize the facilities for learning. It should be noted however, that the e-learning initiative is not to negate the role of teachers but to be used under the guidance of teachers for efficient knowledge dissemination.

A study by Albirini (2006) employed questionnaire method to collect evidence from high school teachers' view on computer attributes, cultural perceptions, computer competence, computer access, and personal characteristics in England. The respondents of the study were 63 male and 251 female teachers (n=314). The result revealed that 57% of the respondents had computers at home and 33.4% had access to computers at school. Equally, Razzak (2013) used a qualitative method to study the challenges facing school leadership in promoting ICT integration in instruction in the public schools of Bahrain. The findings indicated lack of adequate skills on the side of Assistant Principals (AP), and none of the AP's schools could be considered as highly equipped in terms of technology resources, neither in terms of their availability nor in

terms of their currency and age. It is critical, though, to note that both Albirini (2006) and Razzak (2013) have not indicated how academic performance is affected by possession of computers. The importance of linking e-learning resources with performance formed the basis of the current study.

In another study, Shaimaa (2013) used a case study to examine the factors that affect elementary teachers' decision, in an Egyptian international school, to integrate ICT in education with the aim of using the results to inform future ICT related decisions, policies and practices at the school. Using a modified form of participatory evaluation, the researcher used quantitative and qualitative methods to investigate the conditions, context, competencies, and culture that impact ICT integration at the individual and organizational levels. An online survey was administered to all elementary teachers to examine the current status of the school in terms of the 4Cs. This was followed by a focus group for which low-ICT and high-ICT integration teachers were selected to discuss 1) the current state of the school for ICT integration in terms of the 4Cs; 2) the desired state of the school; and 3) recommendations that would enable the school to bridge the gap between both states. One of the main conclusions in this study is that almost all elementary teachers in school X believe in the importance of ICT integration in the teaching and learning process. Deficiencies in their ICT integration trends are not due to teachers' perception, rather they are caused by one or more of the factors identified in the four domains; conditions, context, competencies, and culture such as lack of adequate instructional/pedagogical support or the low quality of some of the professional development sessions that teachers attend. But still, Shaimaa (2013) did not show how deficiency in ICT integration affects academic performance of learners. The current study intended to provide knowledge on how e-learning resources affect performance among pupils in primary school education.

Opira (2010) investigated the effect of ICT on students' learning by taking the case of Gulu University in Uganda. It was conducted through cross-sectional survey design; data was collected using questionnaires and interview techniques from a sample of 275 respondents out of a parent population of 1173. In verifying the hypotheses, the researcher used Pearson correlation analysis method to find out whether students' learning was linearly correlated with ICT. The study established that the availability

of ICT resources in the University is still very much wanting and very inadequate for the students to use. Because of the limited number of functional computers and the computer laboratory, accessibility is timetabled. It was also found that training was mainly limited to introduction to basic concepts of information technology, some application programs notably Ms Office suit and internet; contextual training of students on how to use ICT in learning was not in practice. However, how availability of ICT resources affect academic performance has not come out well in Opira's (2010) study. Availability of e-learning resources for enhancement of academic performance critically needed an inquiry, thus the present study provided an opportunity for the same.

The National Public Private Partnership (PPP) initiative also calls for resources for the government, development partners, public and private organizations and other partners in the commercial and non-profit terms to establish e-centres at constituency level that can be utilized for learning purposes. According to Nderitu (2007), "Kenya participated in a workshop in Addis Ababa in January 2007, which culminated into an eight month programme on e-learning Development and implementation (e-LDI). Participants in this programme learnt highly technical and management skills necessary for successful development and implementation of e-learning programmes. The e-LDI global programme focuses on capacity building as well as qualification of educational institutions with regard to provision of e-learning. The participants in this course develop competencies to become online course developers, e-tutors and managers for e-learning projects. Nonetheless, information related to effectiveness of e-LDI in enhancing academic performance among primary schools has remained scanty to date.

In Kenya, Mbugua et al (2015) examined integration of ICT in teaching in public schools in Nakuru County. The study used a survey research design. A total of 486 public secondary school teachers (81principals and 405 classroom teachers) participated in the study. Three instruments were used to collect the data namely questionnaire for teachers (QT), Principals interview schedule (PIS), and school observation schedule (OS). The study found that ICT facilities were inadequate and teachers had only basic or no ICT skills. Financial constraints and lack of facilities and equipment were some of the challenges teachers faced in integration of ICT in

teaching. A positive significant relationship between integration of ICT and students' academic performance at 0.05 alpha significance levels was also found. Although this study clearly showed the relationship between integration of e-learning resources and academic performance of learners, the target population was drawn from secondary schools. Consideration of a similar study in the context of primary schools, and comparisons of differences within regions generated the interest in the present investigation.

2.3 Utilization of E-Learning Resources and Pupils' Performance

According to Chang (2012), utilization of ICT resources results into effective teaching. However, similar with other studies, whether utilization of ICT resources results in better academic performance or not has received minimum attention of researchers. De Witte and Rogge (2014) examined the effects of ICT on pupil test scores by using large-scale data with initial equivalence of the experimental and control group. The study used data from the rich and large Trends in International Mathematics and Science Study (TIMSS) sample of 2011 for the Netherlands, focusing on the fourth grade students, teachers, and regional education officers in Dutch schools. While initial differences in the test outcomes were observed between pupils in schools with and without ICT shortage and students who are frequently or not using ICT, it was found that these differences may vanish if one accounts for student, teacher, school and regional characteristics. Thus, the present study attempted to investigate the difference with regard to utilization of e-learning resources, besides investigating how utilization of e-learning resources make the difference in academic performance.

Aristovnik (2012) reviewed some previous research examining ICT efficiency and the impact of ICT on educational output/outcome as well as different conceptual and methodological issues related to performance measurement in Slovenia. Data Envelopment Analysis (DEA), a non-parametric frontier estimation methodology that compares functionally similar entities described by a common set of multiple numerical attributes was adopted for the study. The empirical results show that the efficiency of ICT, when taking educational outputs/outcomes into consideration, differs significantly across the great majority of EU and OECD countries. The analysis of the varying levels of (output-oriented) efficiency (under the VRS

framework) shows that Finland, Norway, Belgium and Korea are the most efficient countries in terms of their ICT sectors (when considering educational output/outcome). The empirical results also suggest that, in general, some less developed EU countries such as Slovakia and Poland show a relatively high level of ICT efficiency due to the low level of their ICT inputs. However, ICT utilization within primary schools was not focused upon in Aristovnik's (2012) study. This was one area the current study sought to dwell in.

Another study by Shah and Khan (2015) investigated comparative effectiveness of multimedia-aided teaching (MAT) on students' academic achievement and attitude at elementary level in teaching of science in Pakistan. A sample of 60 students was randomly divided into two groups. Pretest-posttest control group design was selected for this study. The experimental group was taught with the help of multimedia presentations whereas the control group was treated traditionally. The treatment was given for a period of 20 weeks. The valid and reliable questionnaires were used as data collection tools. An Attitude Towards Science Scale (ATSS) was used to measure the attitude of both groups before and after treatment. The independent sample *t*-test was used to analyze the data. The results indicated that MAT is more effective than the traditional one. Students' attitude towards science improves more if MAT method is used as compared to the traditional method of teaching. But it is also important to investigate the effectiveness of such e-learning aided programme on overall performance of learners in primary schools.

Van der Westhuizen, Nel and Richter (2012) investigated the effect of the integration of the Digital Versatile Disc (DVD) into geography teaching and learning for full-time pre-service teachers at a rural university in South Africa; and at the same time ensure that the students' academic performance was not jeopardized by this new and unfamiliar DVD method. An action research design was implemented, and both qualitative and quantitative data were collected. Questionnaires were administered on students upon completion of the module for the three year groups to determine how the students perceived, experienced, and valued the DVD method; what the impact on their academic performance was by comparison; and how to improve the DVD method (n = 42, 31, and 28) for the three year groups, respectively. Results indicate that this learner-centred DVD method was well received and applied by students and

that it did not jeopardise their academic performance. Still, Van der Westhuizen, et al (2012) did not consider investigating the effectiveness of such DVD on academic performance in the context of primary education.

Tella, Tella, Toyobo, Adika and Adeyinka (2007) examined Nigeria primary school teachers' uses of ICTs and its implications for further development of ICTs use in Nigerian schools. The study through census drew on 700 teachers from twenty five purposefully selected private primary schools in Ibadan, Oyo state, Nigeria. This comprised 430 males and 270 females. Their age ranged from 25 – 45 years with a mean age of 35 years. A modified instrument tagged Teachers ICT use survey adapted from ICT survey indicator for teachers and staff by UNESCO (2009) was used for the collection of data. The results showed that teachers generally have access to ICTs in their various schools except e-mail and Internet because their schools are not connected. Technical support are lacking in the schools and teachers lack of expertise in using ICT was indicated as being the prominent factors hindering teachers readiness and confidence of using ICTs during lesson. Furthermore, the results show that teachers perceived ICT as being easier and very useful in teaching and learning. Tella, et al (2007) did not focus on how utilization of ICT affects academic performance among primary school learners. Moreover, regional comparison of utilization of e-learning resources for academic purposes was also not considered. These were areas the present study adequately covered.

The NEPAD conference of 2001 held in Abuja-Nigeria set up a task force to accelerate the introduction of ICT based methodologies for learning in primary schools. Bugulumbya primary school in Uganda became the very first institution to receive computers under the NEPAD'S e-school initiative (Madamombe, 2007). The pupils at Bugulumbya primary accept that the facility has enabled them post good results because having the internet is like having another five teachers in the class-room. Individual African states have also gone ahead to establish task forces that work with recommendations for ICT acceleration from the task force. The use of e-Learning resources across the curriculum stimulates the creativity of the learners making learning more flexible apart from encouraging corporation in the process (Youssef, 2008).

Limo (2007) observes that deploying digital technology for e-learning and the Smart Schools programme is a very expensive and complex undertaking. It calls for the commitment of the government and other stakeholders to help push the subject and not left for individual entrepreneurs as it has been. The Government of Kenya (GoK) through the Ministry of Education (MoE) has developed a national ICT strategy aimed at integrating ICT in our schools. This has been driven by the New Partnership for Africa's Development (NEPAD) initiative recommended that the pilot programmes for the computer use in schools be launched. Towards this the GoK's commitment to e-learning was introduced on December 27, 2005 when a pilot programme was launched at Isiolo Girls' Secondary School (Limo, 2007). This provides a very important point showing the government's effort and will, which in turn attracts other stakeholders to assist in enhancing the program's network. Other programmes that support this initiative include IT Kids that has strategies for providing personal computers to children at affordable costs and Computers for Schools aimed at equipping all schools with computers, The Arid Lands Information Network (ALIN) a Non-Governmental Organization (NGO) that has promoted e-learning by setting up an internet village at Isinya Primary School in Kajiado and the results at the school have improved academically. This was the concerted effort of the two groups namely; The Global e-School and Community Initiative (GeSCI) and The British Council's 'Connecting Classrooms' project.

However this initiative was met with a series of challenges as Mulama (2007) indicates that the benefits from ICT are largely restricted to towns and cities as most rural areas lack requisite infrastructure, equipment and skills needed for communities to take full advantage of the technology. Government figures shown that only 20% of Kenya's population of over 30 million have access to electricity, but observing that about 70% of the population reside in rural areas, the rural-urban technological divide is a great concern in implementing e-learning strategies (Mulama, 2007). The government continued to struggle with the reality of providing the necessary basic requirements for e-learning to take place. Although these initiatives have been on-going across the country, little information is provided with regard to their influence on academic performance.

The Directorate of E-Government has set up the Kenya e-learning Centre (KeLC) which has joined hands with UNESCO to set up an e-learning resource centre to offer information communication technologies to the youth and adult learners so as to facilitate and encourage learning and training of ICT skills (UNESCO, 2009). This partnership has led to the setting up of a computer lab with internet connectivity at Mkomani Girls' Primary School on Lamu Island. But, alongside other related efforts, the influence of integration of e-learning resources on academic performance remained unfocused upon in Kenya.

Mbugua, Gori, and Tanui (2015) examined integration of ICT in teaching in public secondary schools in Nakuru County, Kenya. The study used a survey research design. A total of 486 public secondary school teachers (81principals and 405 classroom teachers) participated in the study. They were randomly selected. Three instruments were used to collect the data namely questionnaire for teachers (QT), Principals interview schedule (PIS), and school observation schedule (OS).The study found that ICT facilities were inadequate and teachers had only basic or no ICT skills. Financial constraints and lack of facilities and equipments ware some of the challenges teachers faced in integration of ICT in teaching. It was also found that there is a positive significant relationship between integration of ICT and students' academic performance at 0.05 alpha significance levels. This study (Mbugua, et al, 2015) was conducted in public secondary schools, while it is equally critical for a similar study to be done in primary schools. Moreover, regional differences with regard to utilization of e-learning resources have also received minimum attention of researchers. The present study therefore intended to bridge this gap by comparing utilization of e-learning resources between primary schools in Kisumu Central and Muhoroni sub counties.

2.4 Challenges facing utilization of E-learning resources

Many countries, Kenya included, have faced a number of challenges in their struggle for full implementation of e-learning in education. The first challenge that these efforts could face is the lack of deliberate, coherent and clearly understood and supported e-learning resources policy and strategy by the individual governments. Colin (2001) supported the view that there is no cohesive strategy for ICTs use in

education. It is believed that when e-learning resources are used for education they are primarily found in private and urban schools.

In order for the e-learning resources to create conceptual relevance in teaching, they should be used tools for teaching rather than as a teacher themselves. When used for teaching they are a powerful indicator of good software that enhances learning (David & Jane, 1991). This view needs emphasis because some teachers who have inadequate teaching practice at primary training level may leave the computer for the pupil to use solely without guidance. It is believed that most of the pupils will turn to using the computers for academically retrogressive purposes like viewing pornographic pictures rather than learning when given the opportunity.

Challenges of e-learning resources utilization based on different regions, particularly among primary schools, seem to have received little attention of researchers. Dix (2007) did an assessment of the impact of ICT on student attitudinal outcomes, in particular, changes in self-esteem over a three-year period of school-wide ICT adoption, was provided through the examination of factors affecting teaching practice and students' attitudes towards computers and school in Australia. A Design-Based Research in Innovative Education Framework (DBRIEF) design was used, taking full advantage of the hierarchical and longitudinal nature of the data. A total of 219 teachers and 2560 students from six metropolitan public primary and secondary schools were targeted. Data was collected through the use of online questionnaires administered over the three-year lifespan of the study. Regressions and correlations were used for data analysis. School-wide integration of ICT is found to promote significant change in teaching practice and has benefits for students, particularly those with low self-esteem. Students' self-esteem and their attitudes towards computers were found to improve significantly in an increasingly ICT-rich learning environment. However, Dix (2007) did not make comparisons in challenges faced in utilization of e-learning resources between primary school in different regions. These areas were appropriately covered in the presents work.

Hassan and Sajid (2013) investigated the barriers to the incorporation of Information and Communication Technologies (ICTs) at secondary level learning in Pakistan. Sequential mixed method design was used in the study. Both qualitative and quantitative instruments were employed. Results revealed that most of the participants

have positive perceptions about integration of ICTs into their teaching and learning. Administrators and ICT coordinators revealed many barriers and possible enablers to the integration of ICTs. Many of these barriers are verified by the teachers and students. Still, incorporation of ICT at primary education seems to be given minimum focus by researchers. This fact therefore motivated the present study.

Adjei-Bisa (2011) drew on previous research evidence to identify relevant research strategies to address the gaps in knowledge about ICT and students' learning in Ghana. This study adopted the experimental research methodology whereby experiment and control situations are established and outcomes from the situations are compared and analyzed. The sample size was students from Forms 4 to 6. Descriptive statistics was used for data analysis. Findings were that Internet enhancement of courses facilitates communication between the instructor and students, as well as easy access of information using the medium promotes the use of economic data and real-world applications to enhance the teaching of theory. There were mixed results on the effect of Internet enhancements on student attitudes toward economics; senior students responded more favorably to economics with the use of the Internet, but no significant difference in mean attitude changes was apparent for the junior students. Equally, Adjei-Bisa (2011), same with other researchers, did not consider the context of primary education. Thus, barriers to adoption of ICT at primary education need the same attention as has been accorded secondary education.

Kamau (2012) sought to establish constraints in the use of ICT in teaching and learning processes in the area in Nyandarua South, Kenya. Specifically, he sought to find out the level of ICT infrastructure establishment enhancing learning and teaching, to find out the extent to which teachers and students are endowed with ICT skills for use in teaching and learning process. The target population of the study consisted of 21 school principals, 160 teachers and 800 form three students in all public secondary schools. Stratified sampling method was used to obtain 220 respondents. Data was collected using questionnaires, interviews and observations, and analyzed descriptively using chi square and Pearson’s product moment correlation. The major findings showed that there were no adequate ICT facilities in most schools making it impossible to incorporate ICT in teaching and learning processes. Where ICT facilities were available there was no proper utilization of the facilities partly because

of lack of staff. Most of the students seemed to engage in entertainment whenever they access computers rather than using them for academic benefits. Where facilities were available there was neither educational programmes nor the internet. It was also found out that most teachers lacked basic computer training hence they need to address this problem. Nonetheless, this study (Kamau, 2012) was done in secondary schools. Thus, the need to conduct a similar study in primary schools became the onus of the present study.

2.5 Theoretical Framework

This study was informed by Jean Piaget's theory of Intellectual Development and Brian Holmes' Problem-solving Approach for Comparative Studies.

2.5.1 The First Theory of Cognitive Development

Piaget's research has fundamentally influenced current primary education. He conceives a number of stages attached to the intellectual development of the child from birth to the age of 15 years.

The first stage is the Sensory motor stage (from birth to 2 yrs) explains that this the time that the child begins to build up concepts as a result of his active experiences with them (Farrant, 1993). This stage is significant to our study since at this tender age the child is sensitive to any sound or movement that communicate a message. The children in schools encounter e-learning devices for learning and their sensitivity help them build up concepts through their interaction with them. Such experiences inform their learning capabilities and makes understanding of the concepts taught in class easy.

The second stage in Piaget's theory of Intellectual development is the Intuitive stage (2 – 7 yrs). At this stage the children learn their inter-relationships with the environment (Farrant, 1993). This is the stage when the child gets ready to join primary school and therefore the learning is more influenced by the learning experiences he/she encounters in the environment away from home. The child becomes so inquisitive and attempts to fit together some jigsaw pieces of his/her world. If e-learning devices for educational methodologies are introduced at this level the children get exposed to manipulative skills that they use for learning at this stage.

The concrete operational stage (7 – 11 yrs) is the third stage of intellectual development. Farrant (1993) says that this is when symbolic activity begins in the child. The child transforms in his/her mind ordinary objects such as the cardboard boxes and sees them as houses or Lorries as he plays. For purposes of language development, the child learns to attach certain linguistic codes to objects. He/she learns to call objects by name. This coding principle helps the child to attach concrete meaning to the things he/she comes in contact with. The skills of listening, reading and writing are exposed at this stage as being meaningful to the child.

The fourth stage is called the Formal operations stage (11 – 15 yrs). This is the stage that our study is going to borrow many concepts from. The reason for its great significance is that within this age bracket the child has reached upper primary level of class six to eight. At the end of this level, in standard eight the pupils sit for the Kenya Certificate of Primary Education where the potential of pupil performance is ranked. During this stage Piaget says that the child begins to extract logical rules from the events and objects that he/she uses. The learner also develops the ability to apply logic to abstract thought. At this stage of intellectual development the child's brain is prepared to take into account linguistic rules. Such rules include those associated to the art of word formation/vocabulary, sentence patterns, creative writing among others. The learner at this stage is able to apply these rules with regard to the exams context. The application of e-learning devices such as the use of computers at this stage helps the children to learn these logics in a simplified way by using the manipulative skills.

Piaget's theory of Intellectual development is a strong indicator of a theory to be adapted by one who aims at giving priority to the learner's needs. It contributes to the firm establishment of child-centred education in primary schools. The role of the teacher in this case is that of offering guidance through relevant teaching strategies and having control over what is learnt to minimal intervention. This child-centred approach to learning gives the child an appropriate environment where he/she interacts freely with the e-learning resources such as computers. In the process of learning, they meet challenging experiences individually and in groups. They are encouraged to exchange ideas, express themselves in various ways and offer critical views on individual contributions (Igaga, 1987). Shin et al. (2007) suggests that

student-centred instruction is likely to become the primary trend in education by 2020. In this regard the teacher and other stakeholders in the educational sector are supposed to provide e-learning resources that create such an atmosphere for concrete learning.

2.5.2 Holmes' (1965) Problem-Solving Approach

Holmes (1965) averred that the problem-solving approach is a scientific method of inquiry in comparative education. He affirms that research begins with a problem (Holmes, 1981). In the current Kenya Basic Education Curriculum Framework, this approach forms part of the core competencies required of a learner as detailed by the Kenya Institute of Curriculum Development (KICD). This makes it relevant for this study. A researcher in a comparative study aims at identifying and analysing a problem with an intention of making policy proposals aimed at improving education practice and predicts the outcome of such proposals (Holmes, 1965). The problem-solving approach involves four major steps. These steps include; problem selection and analysis, formulation of policy proposals (possible solutions), identification of relevant factors and prediction (Holmes, 1965).

2.5.2.1 Problem Selection and Analysis

To ensure quality research is done, the researcher needs to choose the problem carefully (Holmes, 1965). The interest and the experience of the researcher are also worth taking into account. Problem analysis aims at clarifying the problem so as to have a clear focus on the data to be collected. Apart from that, this step also requires that the problem gets classified on the basis of the major factors influencing the study. In this research, the approach highlighted above is relevant in that the problem of differences in performance between Kisumu Central and Muhoroni Sub Counties schools have already been carefully selected. The factors that influence this outcome include; the location of the school (urban or rural), availability of e-learning devices for learning and government policy among others as discussed in the conceptual framework. In particular low performance of the pupils in rural schools has been as a result of unavailability of e-learning facilities to aid instruction. On the other hand, improved infrastructure, economic power and e-learning connectivity gives the pupils in the urban areas an opportunity to do better.

2.5.2.2 Formulation of Policy Proposals (possible solutions)

This step involves the selection of a range of realistic policy choices considered as possible solutions (Holmes, 1981; Holmes, 1965). In this case the researcher gets informed policy options by drawing comparisons from other countries to help him propose policies that can be applicable in the real situation being studied. This study will seek to give possible solutions in reducing the disparity in performance between primary schools in Kisumu Central and Muhoroni Sub Counties.

2.5.2.3 Identification of Relevant Factors

This step involves identifying, describing, and evaluating relevant factors likely to influence the outcome of any of the proposals made (Holmes, 1965). This identification is done at three levels as stated below;

i. Identification and analysis of initial conditions and or contextual determinants, for instance examining how the primary school curriculum plans for instruction.

ii. Selection of the determinants relevant to the particular problem being investigated.

iii. Weighting of the selected determinants in order to indicate their relative degree of influence to the proposed solutions.

The researcher will borrow this Brian Holmes' approach so as to assess the factors that are likely to influence the outcome of the policy recommendations in regard to the influence of e-learning for instruction on the performance of pupils.

2.5.2.4 Prediction

Holmes (1965) suggests that, 'at this stage an attempt to predict the possible outcome of the proposed policies is made. The researcher is expected to pay attention to both the short-term and the long-term consequences of the proposed policies. At this level the researcher is faced with the task of suggesting a criterion through which the proposed solutions can succeed. But the weakness with prediction is that it depends on probability and therefore the proposed policies may not be the appropriate solutions to the problems.

2.6 Conceptual Framework

The conceptual representation guiding this study is derived from Holmes' (1965) problem solving approach and Piaget's theory of intellectual development. This framework shows how the different variables are interrelated in the study. It provides the guidelines for the study. The figure below portrays the framework

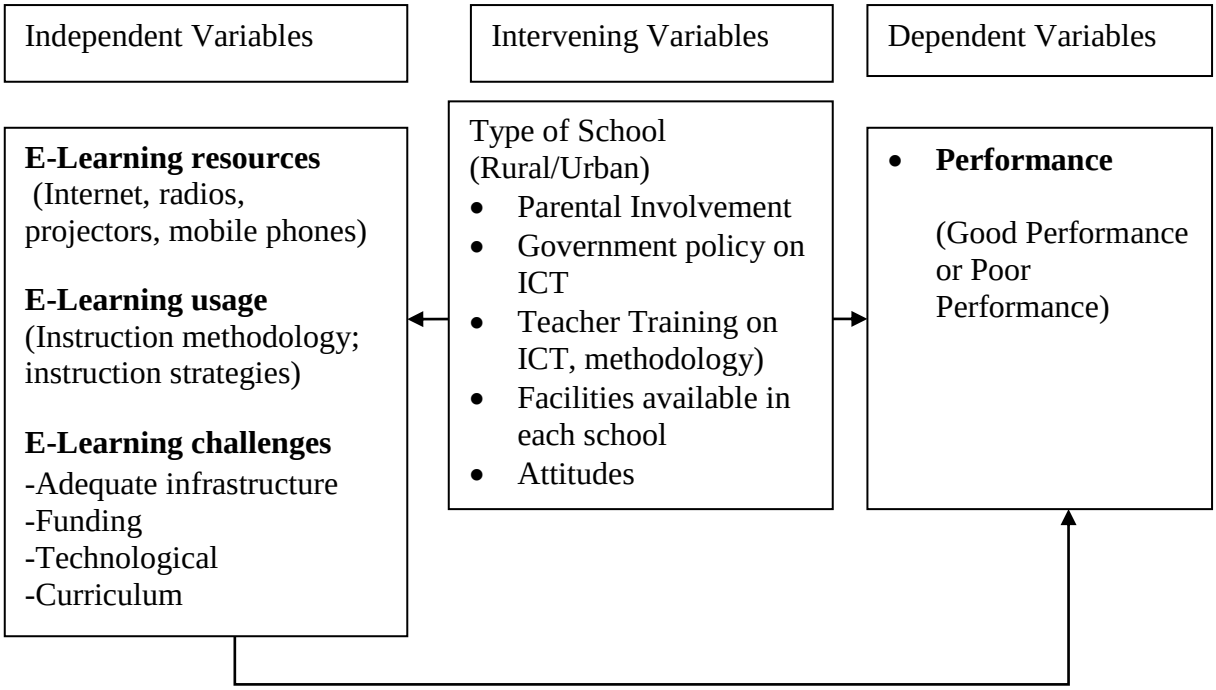

Figure 1: The link between the use of e-learning resources and performance

The dependent variable of the study is performance of pupils, and is influenced by the availability, utilization, and challenges faced in utilization of e-learning resources, which is the independent variable of the study. In the presence of and usage of e-Learning resources, performance can also be affected by ICT policy of the school, parental approach to ICT, and the level of teacher training in ICT; these are the intervening variables of the study. They have an indirect effect on both the independent and the dependent variables. The researcher however held these variables to be the same and constant in each school from both Kisumu central and Muhoroni Sub Counties.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research design, the population and location of the study, the sampling procedures and sample size, the instrumentations and validity and reliability, the piloting, the data collection procedures, and data analysis.

3.2 Research Design

This study adapted ex post facto research design. According to Simon and Goes (2013), ex post facto literally means "after the fact". Kerlinger and Rint (1986) explained that an ex post facto investigation seeks to reveal possible relationship by observing an existing condition and searching back in time for plausible possible contributing factors. Cohen, Manion and Morrison (2011), on the other hand, noted that instead of taking groups that are equivalent and subjecting them to different treatments to determine differences in the dependent variables, an ex post facto experiment begins with groups that are already different in some respect and searches in retrospect for factors that brought about those differences.

Thus, this study used primary schools from two different regions to determine the causes of disparities in past performance, an existing condition, among learners. This design was deemed appropriate because the two groups of learners (from Kisumu Central and Muhoroni sub counties) had already showed differences in their performance during past examinations. Searching in retrospect (in reverse) for factors that might have brought the differences is what therefore prompted the study.

3.3 Location of the Study

The study covered primary schools in Kisumu Central and Muhoroni Sub Counties in Kisumu County. The selected areas were found to be relevant in the sense that Kisumu Central being predominantly urban has more infrastructures to support e-learning and is believed to experience more use of e-learning resources for instruction than those schools in Muhoroni Sub County which is predominantly rural. Also, more people have knowledge on the use of e-learning resources in Kisumu Central than Muhoroni Sub County.

3.4 Population of the Study

The target population is the population to which a researcher wants to generalize the results of the study (Mugenda & Mugenda, 1999). In this study the target population included the pupils in the primary schools, the teachers and the head teachers. A total number of 154 primary schools were targeted for this study, 104 primary schools from Kisumu Central and 50 primary schools from Muhoroni Sub County. Therefore, there was expected exposition of disparity, in findings. Among the pupils, the study focused on those in upper primary preferably from standard seven to eight, hence a total of 3900 pupils, 308 teachers and 154 head-teachers were included in the study from both public and private schools.

3.5 Sampling Procedures and Sample Size

In descriptive research as advanced by Mugenda and Mugenda (1999) at least 10% of the accessible population can be used as the sample size of the study. The sampling frame for Kisumu Central and Muhoroni Sub County are 104 and 50 schools respectively as obtained from the respective education offices. Therefore a total of 10 primary schools in Kisumu Central and 5 primary schools in Muhoroni Sub County were used in this study.

Simple random sampling technique was used to select sample the schools which participated in the study and eliminate the others. According to Kothari (2004), simple random sampling allows every subject in a population an equal chance of being selected to participate in a study. The sample size therefore included 120 pupils, 60 teachers, and 15 head teachers, bringing a sample size of 195 participants for the study as shown in Table 2.

Table 2:

Sample size of the study

Schools	Pupils	Teachers	H/Teachers	Total
Kisumu Central	80	40	10	130
Muhoroni Sub County	40	20	5	65
Total	**120**	**60**	**15**	**195**

Source: County education office Kisumu (2015)

3.6 Instrumentation

The study used two instruments for data collection: questionnaire and observation schedule. The study developed closed ended 5-scale rated questionnaire to collect data from class eight and seven pupils as well as teachers and head teachers. Questionnaires for the class seven and eight pupils helped in finding out the knowledge they have about the computer and other electronic devices. It also helped in finding out how the pupils apply them for learning purposes. The questionnaire for teachers helped to assess the competency of the teachers in using the computers and other e-learning devices for instruction. The questionnaire for the head-teachers solicited information on challenges faced in the technological requirement for installing e-learning equipment, the government policy on IT and parental involvement in improving performance. The shortcomings of the questionnaires were overcome by carefully enhancing their validity and reliability.

The study also made use of the observation schedule. A list of e-learning devices was provided in the observation schedule as a checklist to assess availability and usage during instruction. Observations of e-learning device availability and usage helped in triangulation of data obtained from closed ended questionnaire.

3.7 Pilot Study

For refinement and improvement of the research instruments, a pilot study was conducted for two weeks. Two primary schools were purposely sampled from two locations not involved in the study for this purpose; one from Kisumu East Sub County and the other from Nyando Sub County. A total of 20 pupils, 4 teachers and 2 head teachers were targeted for the pilot study. The research instruments were administered to the schools and were filled by the selected respondents after which they were collected and checked for completeness. The accuracy and preciseness of the instruments was then determined. The pilot study was done to identify areas that needed review so as to restructure the questions on the questionnaire to help elicit expected responses. The schools used for this pilot study were not included in the main research.

3.7.1 Validity

Mugenda and Mugenda (1999) notes that validity is the degree to which the results obtained from the analysis of the data actually represent the phenomenon under study.

To ensure that the data collected in the study accurately represented the variables of the study, content validation was done to determine if the content that the instrument contained adequately covers the contents they are supposed to represent (Mugenda & Mugenda, 1999). Construct related evidence was ensured from the time-to-time consultations with the supervisors and other lecturers in the faculty of Education and Community Studies of Egerton University in the course of constructing and editing of the instruments.

3.7.2 Reliability

According to Kathuri and Pals (1993), the smallest number that can yield meaningful results on data analysis for piloting in a survey research is twenty, thus two primary schools purposively sampled was used for the pre-test. A random sample of respondents was drawn from the schools to include 20 pupils, 4 teachers, and 2 head-teachers. For refinement and improvement of the research instruments, a pilot study was conducted (3.7). Mugenda and Mugenda (1999) suggest that the pre-testing of the questionnaire should be done to a selected sample which is similar in characteristics to the actual sample which the research plans to use in the study. Based on this, two primary schools were purposively sampled from the two locations for this purpose; one from Kisumu East sub county and the other from Nyando sub county.

After the pilot study, the reliability of the questionnaires was assessed using split-half technique since the instrument had an even number of items. This approach eliminated chance error due to differing test conditions as in the test, re-test technique. A reliability co-efficient of 0.70 or 70% was obtained, implying that there was high degree of reliability of the instrument. The two locations are independent hence there was little chances of contamination through previous exposure to research process.

3.8 Data Collection Procedures

Before getting into the field to collect data, the researcher obtained an introductory letter from the Graduate School for the purpose of identification. He used the letter to apply for a research permit from the National Commission for Science, Technology and Innovation. The Researcher then drew up a working timetable for the administration of questionnaires.

The questionnaires were dispatched to the respective respondents who had been identified. Enough time was given to the respondents to fill the questionnaires before collecting them. The researcher then visited the schools and used the observation checklist to find out the e-learning devices used. Thereafter, the researcher observed the examination results and made tables indicating the mean scores achieved in every school in the subjects examined. In addition to this, the researcher also visited other institutions to obtain documentary data to inform the study.

3.9 Data Analysis

The data collected was classified as quantitative and qualitative. Qualitative data was summarised into similarities and differences and analysed quantitatively. Coding of the row data was done to make it orderly. In analysing this data, the researcher used both the descriptive and inferential statistics of quantitative analysis.

The purpose of using measures of central tendency was to enable the researcher to meaningfully describe a distribution of scores or measurements using a few indices or statistics (Mugenda & Mugenda, 1999). The measures of central tendency helped to reduce the quantities of data to manageable forms to include the mean, median and the mode. Given that results from the data collected were generalized to the population under study, the researcher employed inferential statistical methods for this purpose.

This is in conformity to Mugenda and Mugenda (1999) suggestion that ‘inferential statistics are concerned with determining how likely it is for the results obtained from a sample to be similar to results expected from the entire population. The inferential statistical method to be used here was the t-test. The t-test was used to test whether there were significant differences between two means of samples derived from the same group at a specified probability level (Mugenda & Mugenda, 1999). In this research, the t-test for independent samples was used to compare the performance in samples got from the urban area of Kisumu Central Sub County and the rural area of Muhoroni Sub County.

Qualitative data obtained using observation schedule was analysed through thematic analysis (Braun and Clarke, 2006). This involved categorizing generated observations into outstanding themes and reported in narrative forms into two themes

corresponding with both the first and the second objectives (e-learning resources and utilization of e-learning respectively). Information obtained from thematic analysis was used to validate information generated from quantitative analysis (t-test results).

Both qualitative and quantitative approaches to data analysis comply with what Brian Holmes says concerning comparative studies as expounded in section 2.9.2. The Statistical Package for Social Sciences (SPSS) version 21 was used to analyze the data. Table 3 presents the summary of data analysis.

Table 3:

Summary of data analysis

	Research hypothesis	Independent variable	Dependent variable	Data analysis
1	**H_o1:** There is no statistically significant difference in e-learning resources for instruction between primary schools in Kisumu Central and Muhoroni cub counties	Availability of e-learning resources	Pupils' performance between primary schools in Kisumu Central and Muhoroni sub counties	Descriptive statistics Thematic Analysis T – test Analysis
2	**H_o2:** There is no statistically significant difference in the use of e-learning equipment between primary schools in Kisumu Central and Muhoroni sub counties	Utilization of e-learning resources	Pupils' performance between primary schools in Kisumu Central and Muhoroni sub counties	Descriptive statistics Thematic Analysis T – test Analysis
3	**H_o3:** There is no statistically significant difference in the challenges faced in e-learning for Instruction between Primary Schools in Kisumu Central and Muhoroni sub counties	Challenges facing utilization of e-learning resources	Pupils' performance between primary schools in Kisumu Central and Muhoroni sub counties	Descriptive statistics T – test Analysis

3.10 Ethical Consideration

Ethics is defined as use of moral ideologies in designing, conducting and writing research outcomes, with the essential moral standards focusing on the right and the wrong. In social research, ethics involves protection and respect for respondents

taking part in the study (British Psychological Society, 2010). Transparency, openness privacy and honesty were the guiding principle during this research. In this study the ethical issues entailed respecting the respondents' individual rights in the data collection. The respondents were also selected on the basis of their willingness and interest to participate in the study. Once they were briefed on what it entails, the researcher ensured that the respondents feel comfortable and had time to participate in the study.

All data collected were stored under lock and key and only accessible to the supervisor and the researcher. To maintain the confidentiality of the study respondents, the study instruments did not bear names, addresses or any identifiers that could link the information provided to the respondents. The respondents were issued with serial numbers to ensure that the respondent feel free and comfortable to provide truthful information. The respondents were also assured of utmost confidentiality. The consideration of these issues is necessary for the purpose of ensuring the privacy and the security of participants.

CHAPTER FOUR
RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results and discussions of the findings of this study. The results are presented and discussed along three headings in line with the objectives of the study in paragraphs 4.3, 4.4, and 4.5. However, the background information of the respondents was first analysed in paragraph 4.2.

4.2 Demographic Characteristics of Respondents

This section looked at the distribution of respondents by gender, age (teachers and pupils) and according to the teaching experience and the education level of the teachers.

4.2.1 Distribution of Respondents by Gender

The researcher asked the respondents to state their gender and teachers responded as summarized in Table 4.

Table 4:

Distribution of teachers by gender

Categories of Respondents	Frequency	Percentage
Males	38	63.33
Females	22	36.67
Total	**60**	**100**

Source: Study data (2013)

Table 4 illustrates that majority of respondents (63.33%) who were teachers were males while 36.67% of the remaining respondents were females. This portrays the fact that male teachers take more teaching responsibilities in upper primary classes than their female counterparts.

Similarly, the distribution of gender of respondents who were pupils is as shown in Table 5.

Table 5*:*

Gender distribution of pupils

Gender of Respondents	Frequency	Percent
Males	74	56.9
Females	56	43.1
Total	**130**	**100**

Source: Study data (2013)

As concerns the gender of the pupils in the study, it was found that 56 (43%) of the pupils were females while 74 (57%) were males. This highlights the disparities in enrolment between boys and girls in school, despite the provision of free primary education. This disparity may be as a result of the emphasis put on male education than female education by the society because of the wrong perception that girls do not need to be educated but be married off to create wealth in form of bride price.

4.2.2: Distribution of Respondents According to Age

The researcher also asked the respondents to state their ages. The age distribution of pupils was as shown in Table 6.

Table 6:

Distribution of pupils by age

Age Groups	Kisumu Central	Percent	Muhoroni Sub County	Percent
12 to 14	60	75	10	25
15 to 17	20	25	28	70
18 to 20	0	0	2	5
TOTAL	**80**	**100**	**40**	**100**

Source: Study data (2013)

As shown in the above table, a majority (58.3%) of the pupils fell in the age bracket of 12 – 14 (50% from Kisumu, and 8.3% from Muhoroni Sub County). This was followed by 40% of the pupils within the age bracket of 15 – 17 years (23.3% from Muhoroni Sub County schools, and 16.7% from Kisumu Central schools). The rest

(1.7%) of the pupils aged 18 – 20 (1.7% from Muhoroni Sub County schools, and none from Kisumu Central schools). It is important to note that children from urban regions (for instance, Kisumu Central) do start attending school at early ages, as opposed to children from rural regions (like Muhoroni Sub County, in this case). This shows that the level of academic sensitization in the urban area of Kisumu Central is high, meaning that more people appreciate the importance of educating their society here. It also indicates that a bigger population from here has seen more benefits of education as opposed to the rural areas.

The second question concerning respondents' age targeted the teachers. The distribution of teachers according to their ages is shown in Figure 2.

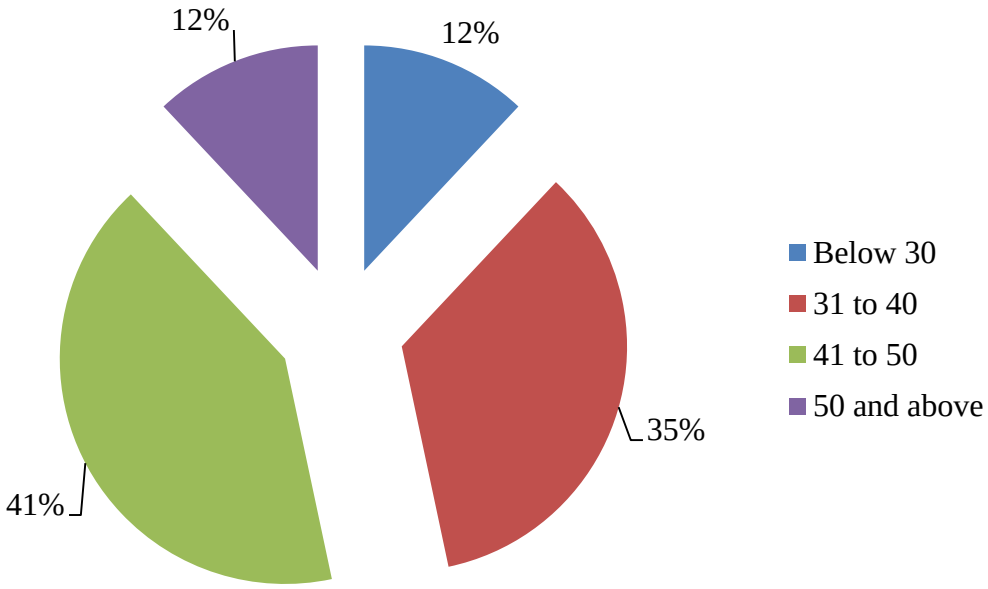

Figure 2: Distribution of teachers by age

The study established that majority (41%) of teachers were aged between 41 to 50 years, followed by 31 to 40 years (35%). Teachers who were aged below 30 years and those aged 50 years and above were 12% for each age bracket. This serves as an indicator to the fact that the amount of workload in class 7 and 8 requires teachers with a maturity, experience and energy level found in age brackets of between 41 and 50 years. Despite that, the lower percentage of teachers aged below 30 years depicts

the current national trend where after training teachers have to wait for as many as 6 years or more before being employed by the government.

4.2.3: Distribution of Respondents According to Teaching Experience

The distribution of teachers according to teaching experience was also assessed by the researcher. The findings are as shown in Figure 3.

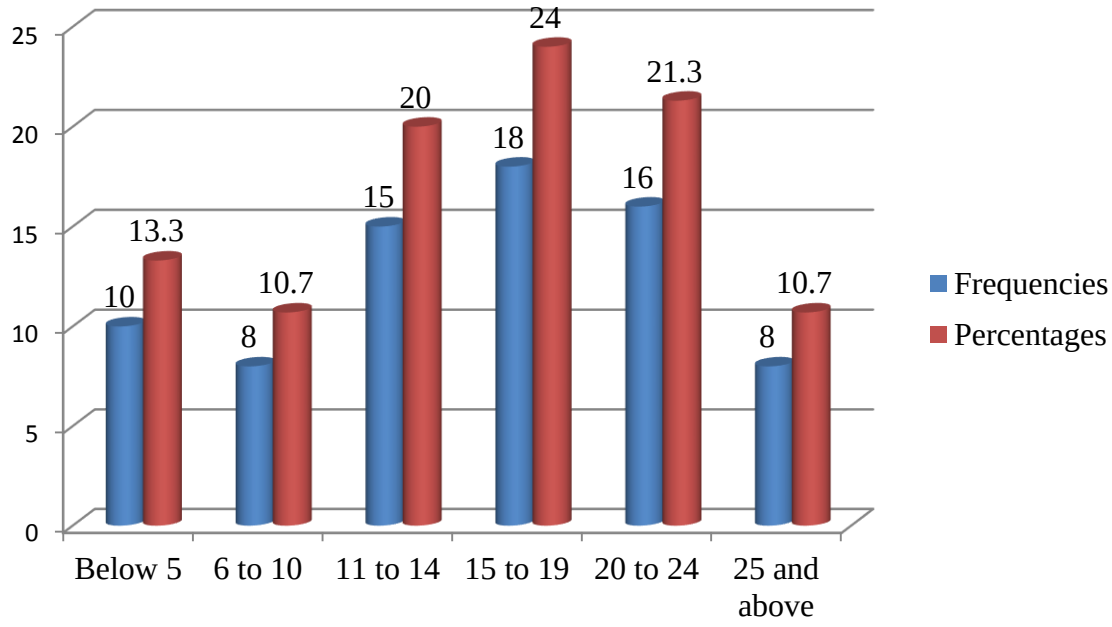

Figure 3: Distribution of teachers by teaching experience

The teaching experience of teachers illustrated in the figure above shows that majority (24%) of teachers had teaching experience of between 15 to 19 years, followed by teachers with teaching experience of between 20 to 24 years (21.3%). Teachers who had teaching experience of between 11 to 14 years were 20% of the teachers; 13.3% had below 5 years teaching experience, while those with between 6 to 10 years and above 25 years' experience were 10.7% for each category of teaching experience. The significance of the high number of years' teaching experience is due to the fact that class 7 and 8 requires teachers with advanced experience of teaching to enable them (teachers) impart adequate skills to the pupils necessary for their preparation towards the achievement of good academic grades in the final examinations.

4.2.4: Distribution of Respondents (Teachers) by Education Level

The last part of demographic characteristics of the respondents sought to establish the education levels of teachers from the two regions. Table 7 illustrates the distribution of the teachers' education of level.

Table 7:

Distribution of teachers by education levels

Education Level	Kisumu Central	Percent	Muhoroni Sub County	Percent
P1 Certificate	22	55	10	50
Diploma	4	10	4	20
Degree	14	35	6	30
TOTAL	**40**	**100**	**20**	**100**

Source: Study data (2013)

The table above shows that majority (53.3%) of the teachers were of P1 level of education, while 33.3% had degree level, and 13.3% had diploma level of education. Owing to the fact that primary school teachers are recruited from candidates who have graduated with P1 certificates, it can be said that the achievement of degree and diploma levels of education is an endeavours by the teachers under study to improve their skills in teaching.

After presenting the background information of the respondents who participated in the study, the results and discussions are hereby given in accordance to the objectives of the study.

4.3 E-learning Resources in Primary Schools

For the effectiveness of e-learning in instructions to be achieved in our learning institutions, adequate technical infrastructure like computer hardware, software, and internet access, among others must be available. The researcher therefore sought to establish the availability of e-learning resources in the sampled schools by listing particular devices necessary in facilitating instruction, and requested the respondents to state the level of their agreement (on a scale of 1= STRONGLY DISAGREE; to 5= STRONGLY AGREE) to confirm the availability of such resources in their institutions. The results are as shown in Figure 4.

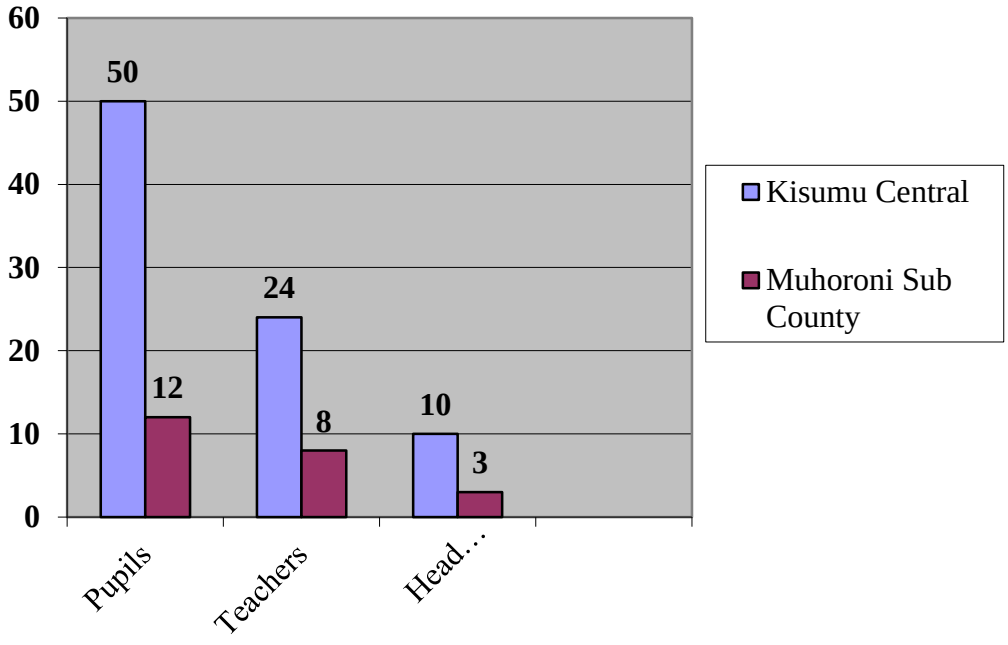

Figure 4: E-learning resources availability in Kisumu Central and Muhoroni schools

The figure (Figure 4) shows that 51.7% of the pupils indicated that e-learning resources presented to them in the questionnaires are present in their schools, (*M*=4.13). 80.6% of these pupils were from Kisumu Central, while 19.4% were from Muhoroni Sub County. For the teaching staff, 53.3% of those who participated accepted that the e-learning resources stated in the questionnaire were available in their schools, (*M*= 2.13). These included 75% of teachers from Kisumu Central and 25% were from Muhoroni Sub County. From the Head Teachers data, 86.7% accepted that they have e-learning resources stated in the questionnaire within their institutions, (*M*= 0.87). These were composed of 76.9% Head Teachers from Kisumu Central, while the remaining 23.1% were from Muhoroni Sub County.

A majority of the respondents agreed that e-learning resources which the researcher presented in the questionnaire are available in their (respondents) schools. However, respondents from Kisumu Central seem to be in possession of more e-learning resources than respondents from Muhoroni Sub County. More pupils, teachers, and head teachers from Kisumu Central than the ones from Muhoroni Sub County indicated that they have e-learning resources which were presented.

Families in urban areas normally have access to electricity services which is needed for powering e-learning resources, unlike families in rural set ups who do not normally have enough access to electricity services. It is not uncommon to meet such imbalance in availability of e-learning resources according to areas where individual families come from.

The income and social lifestyles of families also determines whether a family will possess or not possess certain types of e-learning equipment. The families who come from under privileged socio-economic environments normally possess more e-learning equipment than the less privileged families (Conger et al., 1997; Haveman & Wolfe, 1995). Socio economic and regional backgrounds have been established to be determining factors for e-learning availability, be it in schools or homes (Bratti, Checchi & Filippin, 2007).

The results of the analysis of central tendency were also tabulated as shown in Table 8.

Table 8:

E-Learning resource in Kisumu Central and Muhoroni sub county schools

	N	**Mean**	**Std Deviation**	**Std Error**
Kisumu Central	10	28	18.29346	1.996
Muhoroni Sub County	**5**	**7.67**	**5.821286**	**1.214**

Source: Study Data 2013
$\alpha = 0.05$

The table above (Table 8) indicate that schools in Kisumu Central (*M*=28, *SD*=18.3) have more e-learning resources than Muhoroni Sub County (*M*= 7.67, *SD*=5.82).

Further, the hypothesis below was tested for the statistical significance at 0.05 degree of confidence:

Hypothesis One (H_O1): There is no statistically significant difference in e-learning resources for instruction between primary schools in Muhoroni Sub County and Kisumu Central

In testing whether there is statistically significant difference in availability of e-learning resources for instruction between primary schools in Kisumu Central and Muhoroni Sub Counties, the statistical difference in e-learning resources gave a calculated *t* of 0.24, with *df* 13, while the critical value for a two tailed ($C.V_{t\,(13),\,2tailed}$ = 2.16). The computed t value is smaller (or insignificant) in magnitude than the critical value of 2.16 (obtained from the t table). Therefore, the null hypothesis that there is no statistically significant difference in the e-learning resources in Kisumu Central and Muhoroni Sub County schools is accepted. The overall performance of the schools which are found in the two regions cannot therefore be said to be influenced by the availability of e-learning resources.

The testing of the hypothesis that there is no statistically significant difference in availability of e-learning resources for instruction between primary schools in Kisumu Central and Muhoroni Sub Counties established that the difference in availability of e-learning resources is not statistically significant. This is not uncommon, given that most schools and families (for that matter) might be in possession of e-learning resources although the same resources are not being used for instruction. Lack of technical support and knowledge may also lead one to source for an e-learning gadget which is obsolete and unsupportive of e-learning (Inspectorate Evaluation Studies, 2008). The same manner in which the few e-learning resources possessed by families and schools in Muhoroni Sub County is not helping them for learning is the same way it is not helping Kisumu Central families and schools, where e-learning resources are more available.

Poor choices of hardware and software may also result into a scenario where the available e-learning resources cannot be used to aid teaching either in school or at home (Newhouse, 2002). Such devices should be tailor-made to the requirement of the end user. There is need for continual planning which is essential for keeping e-learning infrastructure upto date (Paul, Judith & Dave, 2003).

According to the observations made by the researcher concerning availability of e-learning resources for instructions in school, it was found that most teachers and school administrators who have e-learning resources like computers and laptops use the equipment for administrative purposes and not for lesson delivery. This may be brought about by the challenge that when instructors teach in class they must not only prepare for the class itself, but also develop contingency plans in case of technical problems. Similarly, pupils who possessed e-learning resources like mobile phones or digital cameras majorly use them (resources) for general communication purposes, and not for academic purposes.

4.4 Usage of E-Learning Resources in Primary Schools

The use of e-learning devices largely depended on their availability, besides other factors like source of power. To test how e-learning resources are used by the selected primary schools under study from the two regions, statements highlighting the frequency of use of the e-learning resources whose availability were tested in Hypothesis 1 were presented to the respondents, by asking them to state the level of their agreement (from a scale of 1=STRONGLY DISAGREE to 5=STRONGLY AGREE) with the stated statements. The results are as stated in Figure 5.

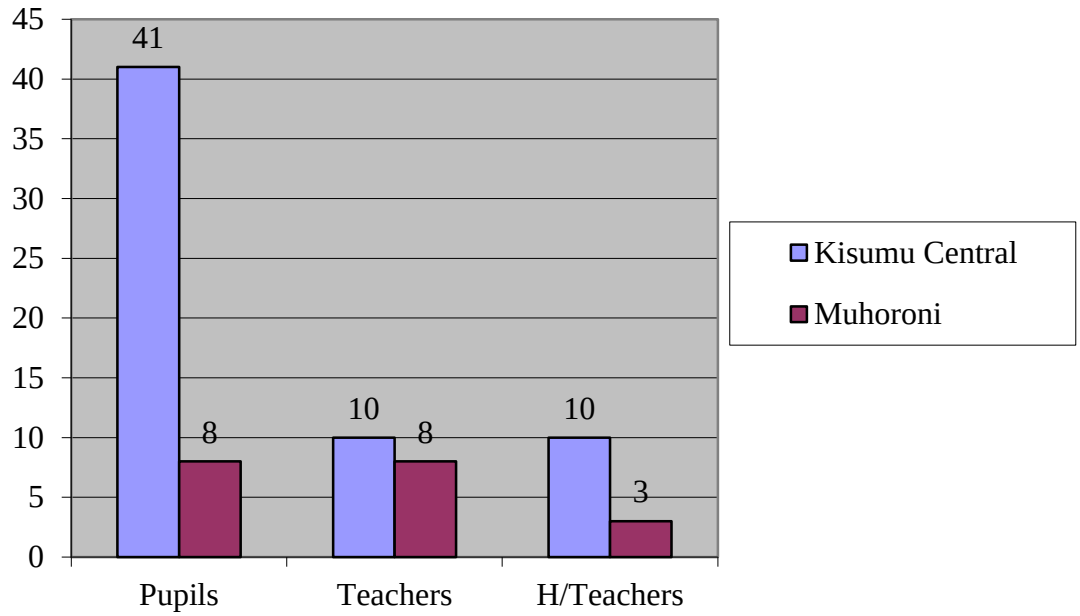

Figure 5: E-learning usage in schools from Kisumu Central and Muhoroni

The results in figure 5 shows that 40.8% of the pupils frequently use the e-learning resources presented to them in the questionnaire, (*M=0.41*). This included 83.7%

pupils from Kisumu Central schools (*M*=0.84), and 16.3% pupils from Muhoroni Sub County schools (*M*=0.16). It is evident that the higher availability of e-learning resources in Kisumu Central has contributed to the higher frequency of use by the pupils from that area while the low frequency in availability in Muhoroni Sub County has disadvantaged the pupils there. This implies students do not have equal access to computing capability which creates something of digital divide among them.

40% of the teachers sampled for this study accepted that they frequently use e-learning resources for instruction to their pupils (*M*=0.4). Among those who indicated that they frequently use e-learning resources, 66.67% were teachers from Kisumu Central (*M*=0.67), and the remaining 33.3% were teachers from Muhoroni Sub County schools (*M*=0.33). This disparity has been caused by the digital divide between the two regions where the study was based.

For the head teachers who were sampled, 86.6% of them indicated that they frequently use the listed e-learning devices (*M*=0.87). Among the school administrators who indicated that they frequently use the listed e-learning resources, 76.9% were from Kisumu Central schools (*M*=0.77), while 23.1% were from Muhoroni Sub County schools *M*=0.23).

The result of analysis of central tendency is shown in Table 9.

Table 9:

E-learning utilization in Kisumu Central and Muhoroni sub counties

Region	N	Mean	Std Deviation	Std Error
Kisumu Central	10	22.333	19.778	7.6748
Muhoroni Sub County	5	6.333	6.1709	0

Source: Study data 2013
$\alpha = 0.05$

The results in Table 9 indicate that schools in Kisumu Central (*M*=22.33, *SD*=19.78) use more e-learning resources than schools from Muhoroni Sub County (*M*= 6.33, *SD*=6.17).

The results obtained regarding the level of use of e-learning resources for instruction in primary schools from Kisumu Central and Muhoroni Sub Counties show that more

respondents from Kisumu Central use e-learning resources than respondents from Muhoroni Sub County. When the numbers of pupils, teachers, and head teachers who indicate that they frequently use e-learning resources is compared with the numbers who accepted that they possessed e-learning resources, it can be noticed that the number of respondents (pupils, teachers, and head teachers) who use these resources are fewer than those who possess them (resources). The lack of usage of e-learning resources for instruction can be attributed to several barriers.

The challenge arises when pupils and their teachers are expected to use e-learning equipment which requires special technological skills (Dawes, 2001). Pupils should be provided with training courses in handling new devices, modern technologies, and pedagogical approaches, while teachers should prepare themselves (pre-service) by self training, and taking up opportunities for training offered at the school (Bingimlas, 2009).

The other reason why usage of e-learning might be lower can also be attributed individual based (teacher related barriers), such as lack of time, lack of confidence, and resistance to change (Becta, 2004). Teachers may be taking many lessons per week, and getting adequate time to use e-learning support services (like internet) becomes limited. Time limitation as a barrier makes it difficult for teachers to schedule enough time to classes for e-learning (Begges, 2000; Schoep, 2005). The teacher may also be lacking confidence in class due to lack of technical knowledge in e-learning; most teachers who are less skilled in e-learning fear exposing their ignorance in front of their (teachers') pupils (Becta, 2004).

The attitude of teachers regarding the use of e-learning for instruction may also contribute to lower usage of the devices in the two regions (Kisumu Central and Muhoroni Sub County). Schoepp (2005) avers that resistance to change (from traditional face to face instructions to e-learning approaches) is due to the dilemma that teachers have on whether e-learning resources can aid successful instruction delivery (and hence enhance academic performance) or not.

'O'zden (2007) observes that another main problem with implementation of new e-learning science was the insufficient amount of in-service training on the use of e-learning. He further observes that courses only focus on teachers acquiring basic e-

learning skills and do not often teach teachers how to develop pedagogical aspects of e-learning. This leads to another barrier of lack of competence in teachers to use e-learning for instruction. Newhouse (2002) found that many teachers lacked knowledge and skills to use computers and were not enthusiastic about the changes and interpretation of supplementary learning associated with bringing computers into their teaching pattern. Due to these and other reasons, the teachers would not efficiently utilise the available e-learning resources for instruction in Kisumu Central and Muhoroni Sub County to improve the performance of pupils.

Hypothesis Two (H_O2): There is no statistically significant difference in the use of e-learning resources between primary schools in Kisumu Central Muhoroni Sub Counties

In testing whether there is statistically significant difference in the use of e-Learning resources for instruction between primary schools in Kisumu Central and Muhoroni Sub Counties, the statistical difference in e-learning usage gave a computed t of 0.33 with *df* 13; while the critical value ($C.V_{t\,(13),\,2tailed} = 2.16$). This computed t is smaller (or statistically insignificant) in magnitude than the critical value of 2.16 (obtained from the t table). Therefore the null hypothesis is retained: that there is no statistically significant difference in the use of e-learning resources in schools from Kisumu Central and Muhoroni Sub Counties.

The good performance posted by schools from Kisumu Central cannot be associated with the usage of e-learning resources. This conforms to a study by Leuven, Lindahl, Oosterbeek, Webbink (2004) which concluded that there is no evidence for a relationship between increased educational use of e-learning and students' performance. In fact, they find a consistently negative and marginally significant relationship between e-learning use and some student achievement measures. Students may use e-learning to increase their leisure time and have less time to study. Online gaming and increased communications channels do not necessarily mean increased achievement. Many e-learning students lack confidence and experience with computers. Not all students even those comfortable with using a PC for e-mail, web browsing or playing games have necessary skills to fully succeed in e-learning reliant courses (Paul Arabasz et al, 2003).

In testing the hypothesis that there is no statistically significant difference in the level of use of e-learning for instruction in primary schools in Kisumu Central and Muhoroni Sub Counties, the researcher found that there is no statistically significant difference. The difference in performance of pupils from the two regions cannot therefore be attributed to the use of e-learning for instruction, but other factors which are teacher-related, school-related, and pupil-related may be contributing to this difference.

A study by Youssef (2008) showed that the pupils' characteristics, denoted by age, gender, family structure, level of parents' education, geographical area, and economic status of parents is an important factor in the educational performance of pupils. Students who come from underprivileged socio-economic environments have tended to post poor school performances than the ones from privileged socio-economic backgrounds or environments (Conger et al., 1997; Haveman & Wolfe, 1995). Bratti et al. (2007) further showed that the differences in student performance can be explained by the differences between the geographical areas in terms of economic structures, regional leisure, type of institutions and the individual characteristics of the students (family and social characteristics).

The other factor which can influence the difference in performance of pupils is the teacher characteristics. Teaching experience and teacher quality in terms of topic coverage and instruction delivery skills has been found to have positive impact on the academic achievement of pupils (Clotfelter et al., 2004; Betts et al., 2003). The teacher is also influential in the setting up of classroom climate which is conducive for learning (Rockoff, 2004). In addition, there is also a significant impact of classroom interactive climate between learners themselves on one hand, and between learners and the teacher, on the other hand (Rivkin et al., 2005).

Educational inputs can also impact on the students' performance, based on educational production functions (Glen, 2006; Glewwee and Kremer, 2006, as cited by Youssef, 2008). The more the students benefit from the physical environment of education the better is their achievement. One prominent variable in the environment and physical investment is class size. A better higher education environment is correlated with small classrooms. This is evident in a study conducted in 2004 by Arias and Walker (2004) who sought to test the relationship between class size and

student performance. While they controlled variations in instruction, lecture material, and topic coverage by using the same instructors, they found class size had a positive impact on student performance. A smaller class size encourages better performance because the teacher-pupil contact time is higher.

4.5 Challenges Facing E-Learning for Instruction in Primary Schools

The challenges faced in applying e-learning in instruction delivery to pupils in the two regions were identified from literature reviews carried out by the researcher, and a list of 5 issues which pose much challenge presented to the respondents. To test the difference in challenges in the selected primary schools under study from the two sub counties, statements highlighting some of the challenges in resources and usage of the e-learning resources were presented to the respondents, by asking them to state the level of their agreement (from a scale of 1=STRONGLY DISAGREE to 5=STRONGLY AGREE) with the provided statements.

The results are as stated in Figure 6.

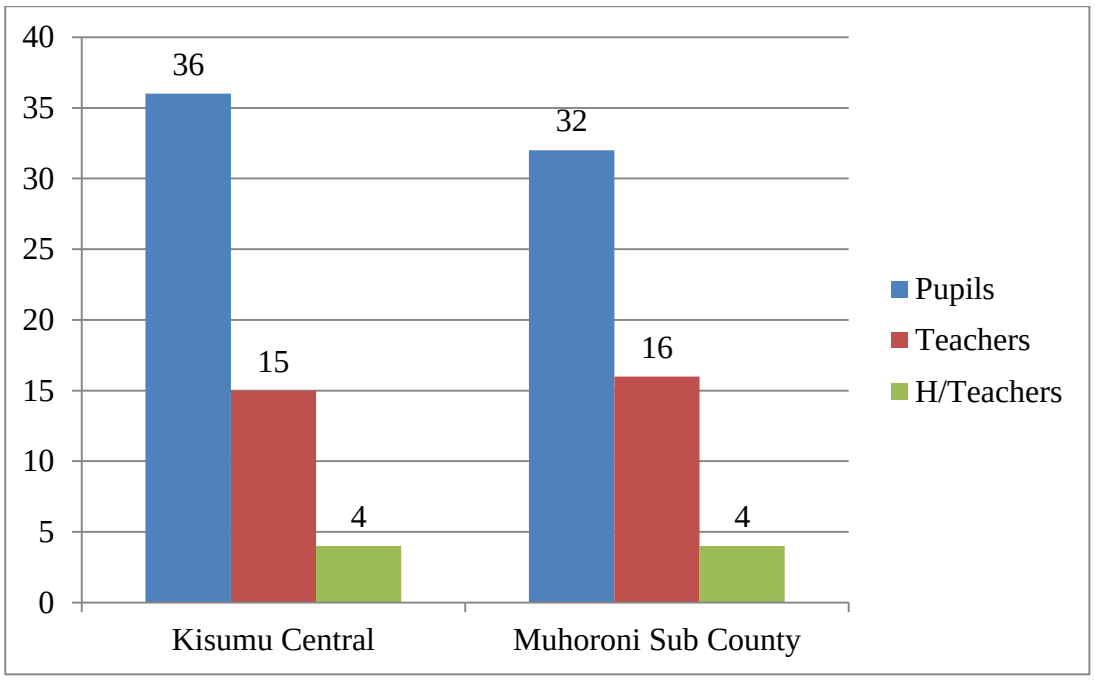

Figure 6: Challenges of e-learning in primary schools

As shown in figure 6, majority (56.67%) of the pupils who were sampled agreed that they face the challenges that were put down on the list presented in the questionnaire, representing a mean of 0.57 response rate. Of these, 52.9% were pupils from Kisumu

Central, (*M*=0.53). Muhoroni Sub County had 47.1% who accepted that they face the challenges as listed in the questionnaire, (*M*=0.47).

The teachers who agreed that the listed issues are a challenge to their teaching practice using e-learning resources were 51.67% of the teachers who were sampled for the study. Out of these teachers who agreed that the stated issues as listed in the questionnaire pose challenges to their teaching practice, 48.39% came from Kisumu Central, (*M*=0.48), while the remaining 51.61% came from Muhoroni Sub County, (*M*=0.52).

Of the head teachers who were sampled for the study, majority (53.3%) agreed that the listed issues in the questionnaire are setbacks in the provision of e-learning in the schools which they head, representing e mean of 0.53 of responses. Of these, 50% of the teacher, (*M*=0.5) came from Kisumu Central while the other 50% came from Muhoroni Sub County, (*M*= 0.5).

The above results point to the fact that the schools from both regions do experience almost equal magnitude of the outlined challenges, which can be seen in the congruence in perception of the head teachers. The result of analysis of central tendency is shown in Table 10.

Table 10:

Challenges facing e-learning for instruction in primary schools

Region	N	Mean	Std Deviation	Std Error
Kisumu Central	10	18.333	16.47796	0
Muhoroni Sub County	5	17.333	14.04754	0

Source: Study data (2013)

The results in Table 10 indicate that difference in schools from Kisumu Central (*M*=18.33, *SD*=16.48) and from Muhoroni Sub County (*M*=17.33, *SD*=14.047) in challenges in e-learning resource and usage is minimal and insignificant.

Further, the hypothesis that there is no statistically significant difference in the challenges faced in e-learning for instruction between primary schools in Kisumu Central and Muhoroni Sub Counties

Hypothesis Three (H_O3): There is no statistically significant difference in the challenges faced in E-Learning for Instruction between Primary Schools in Kisumu Central and Muhoroni Sub Counties.

In testing whether there is statistically significant difference in challenges faced in e-learning for instruction between primary schools in Kisumu Central and Muhoroni Sub Counties, the statistical difference gave a computed t of 0.135 with *df* 13; while the critical value (C.V. $_{t(13)\ 2tailed}$ =2.16). Therefore the null hypothesis that there is no statistically significant difference in the challenges facing e-learning for instruction by primary schools in Kisumu Central and Muhoroni Sub Counties is retained. This is because the calculated t (0.135) is less than the critical value obtained from the t table (2.16). The issues that are faced as far as e-learning resources are owned and used in primary schools from both regions are more or less the same.

The challenges facing e-learning for instruction in primary schools in Kisumu Central and Muhoroni Sub Counties were found to be of almost equal magnitude. According to Figure 7, the number of pupils, teachers, and head teachers who expressed that the challenges of e-learning that the researcher presented were common within and outside (at homes) their schools varied with a small margin: Kisumu Central (36 pupils) against Muhoroni Sub County (32 pupils); 15 teachers from Kisumu Central against 16 teachers from Muhoroni Sub County; 4 head teachers from Kisumu Central against 4 teachers from Muhoroni Sub County.

However, the number of respondents (pupils, teachers, and head teachers) who indicated that the e-learning challenges presented by the researcher are not common within and outside (at home) their schools were larger in Kisumu Central than Muhoroni Sub County. More pupils, teachers, and head teachers from Kisumu Central are able to access and use e-leaning resources than pupils, teachers, and head teachers. Worth noting is the fact that e-learning resources are powered by electricity, which is readily available in urban centres (in this case, Kisumu Central) as opposed to Muhoroni Sub County (which is a rural set up).

In testing the hypothesis that there is no significant difference in the challenges faced in e-learning for instruction in primary schools in Kisumu Central and Muhoroni Sub Counties, the researcher found that there is no significant difference. The differences

in challenges of e-learning resource or usage for instruction expressed by the respondents are statistically insignificant and cannot influence performance in primary schools in Kisumu Central and Muhoroni Sub Counties.

Though there are several advantages to be derived from the implementation of e-learning, these benefits are not likely to be realised due to certain fundamental challenges. E-learning requires a new instructional design. In using e-learning resources for instruction, the teacher plays a new different role which he/she might not be ready for. While devising a course, teachers become designers of experiences, processes and contexts for the learning activity. Besides identifying the contents, they also have to focus on motivations and active learning processes (Cantoni et al, 2004). Anderson and Gronlund (2009) argue that the appropriateness of pedagogical models favour a move from instructor-centred approach to a learner–centred approach where students take ownership of the learning. According to Karim and Hashim (2004), in education curricula and instruction must be reviewed in the light of the demand of information and communication technologies (ICTs). If this is observed in Kisumu Central and Muhoroni Sub Counties, the e-learning resources will be effectively used for instruction of subject contents and performance will improve.

There is also the challenge of limited time for students to use e-learning resources for learning. The amount of time the students have to and want to commit to the course play an important role in the success of e-learning implementation. Benjamin and Anders (2011) noted that time devoted to learning is an important predator of a student's learning and retention. When several issues like parental assignments compete for the attention of a pupil without prioritisation very little can be achieved from e-learning programmes. It was evident that the participation of pupils in other activities such as duties given to them by parents at home and their participation in co curricular events in primary schools in Kisumu Central and Muhoroni Sub Counties take much of their time to prepare for, minimising the time for utilisation of e-learning resources for learning.

The other challenge is the lack of academic confidence in the students. Simpson (2004) says that the academic confidence in a student can predict the success or failure of a student in an e-learning course. Andersson (2008) observed that academic factors such previous academic experiences and qualifications can best describe

students' performance. Where a student's self efficacy, which is his/her confidence in his/her ability to successfully complete a course, is high, the potential of impacting positively on the success of an e-learning implementation can be positive. In Kisumu Central and Muhoroni Sub County primary schools it was noted that those who did not attempt to use e-learning resources at any level lacked the confidence of using the same at school. This made the use of e-learning for academic instruction insignificant to performance.

Lack of technological skills by teachers is another challenge that emerged. Many teachers in the primary schools in Kisumu Central and Muhoroni Sub Counties have not attended training on the use of e-learning resources for instruction. This impacts negatively because their efficiency in the use of e-learning resources for instruction is compromised. Benjamin and Anders (2011) observe that the ability of teachers to use technology to impart knowledge and skills to their students can determine the impact to be made with e-learning. This ability is equally dependent on their prior experiences with technology's use and skills acquired. In situations where the confidence of a teacher in the use of technology is low, the teacher would either not use or use it ineffectively. In both cases, the chances of a successful implementation of e-learning for instruction would be poor (Kwofie & Henten, 2011). This will not assist in achieving the educational objectives that can only be realised through effective instruction.

Lack of awareness amongst the people on the importance of e-learning is a challenge that goes beyond pupils in primary schools. Most parents do not appreciate the role of e-learning resources in education. This is because majority of them have not made efforts to avail some of the e-learning resources for their children at home for early orientation in use. Cantoni et al (2004) noted that many of the people who interact with e-learning systems have little experience due to lack of awareness. In this study it was noted that the traditional mode of instruction is predominantly used by teachers in the primary schools.

The other aspect that is of a challenge is low adaption rate. The primary schools are not able to embrace e-learning for instruction because the administrators are not able to equip their schools with the e-learning devices due the high initial costs. Most institutions are keen to embrace e-learning, nevertheless, issues like lack of e-content,

inadequate infrastructure coupled with the problem of digital divide have also resulted in low adoption. Cantoni *et al* (2004) observed that limitations of bandwidth due to cost implications limit the level of use of e-learning resources for instruction. It is evident that the cost of acquiring e-learning resources and putting of infrastructure emerged as a major problem that contributed in many primary schools not embracing e-learning for instruction in their schools in Kisumu Central and Muhoroni Sub Counties.

There is also the difficulty of engaging learners online. According to Anderson (2008) the use of e-learning for instruction requires a very high degree of self motivation which is found to be lacking among our learners. Learners find it difficult to migrate from traditional learning mode to the new e-learning mode. E-learning requires more responsibility and self discipline for the learner to cope with freer and unconstrained learning processes. Therefore, if a teacher is not keen on every learner's concentration most of the content is bound to go un-understood. Since the learners in Kisumu Central and Muhoroni Sub Counties look at e-learning as a new strategy for learning, it was difficult to engage them actively in the few lessons using e-learning resources.

CHAPTER FIVE
SUMMARY OF RESULTS, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

This chapter presents the summary of findings in view of e-learning resources and usage for instruction and challenges faced in utilization of e-learning for instruction. In the same order it discusses conclusions, recommendations as well as areas for further research.

5.2 Summary of Results

This study sought to compare the resources, usage and challenges of e-learning for instructions in primary schools from Kisumu Central and Muhoroni Sub Counties. The aim was to establish whether they have an influence on performance. Three specific objectives guided the study: to compare the differences in e-learning resources for instruction between primary schools in Kisumu Central and Muhoroni Sub Counties, to determine the extent of use of e-learning for instruction in primary schools in Kisumu Central and Muhoroni Sub Counties and to identify the challenges facing the use of e-learning resources for instruction among primary schools in Kisumu Central and Muhoroni Sub Counties. Data was collected from primary sources through the administration of questionnaires and observation guides. Data was also collected from secondary sources by reviewing existing literature and other documents. Organization and analysis of collected data was done using descriptive and inferential statistics and presented in appropriate tables, charts and figures.

The summary of the following study findings are anchored on the objectives of the study, data collection and data analysis.

5.2.1 E-learning Resources for Instruction in Primary Schools

The results reveal that;

i. More pupils, teachers, and head teachers from Kisumu Central have e-learning devices than pupils, teachers, and head teachers from Muhoroni Sub County as exemplified (Figure 4).

ii. In comparing the e-learning resource availability between primary schools from both regions, it was found that Kisumu Central schools have more e-

learning resources than Muhoroni Sub County schools (Table 8). This is attributed to the available infrastructure like power connections that support the use of e-learning resources as compared to the rural set up of Muhoroni Sub County.

iii. However, the t-test for statistical significance difference between primary schools from Kisumu Central and Muhoroni Sub Counties found that there is no significant difference in e-learning resources between primary schools from Kisumu Central and Muhoroni Sub Counties.

5.2.2 E-learning Usage for Instruction in Primary Schools

The second objective of the study sought to establish the level of e-learning usage between primary schools in Kisumu Central and Muhoroni Sub Counties. The results revealed that;

i. There is low level of usage of e-learning resources both in Kisumu Central and Muhoroni Sub County primary schools (Figure 5).

ii. However, when the e-learning usage in primary school from both regions was compared, it was revealed that schools from Kisumu Central use more e-learning resources than schools from Muhoroni Sub County (Table 9).

iii. The t-test for statistical significance difference in the usage of e-learning resources for instruction between primary schools from Kisumu Central and Muhoroni Sub Counties found that there is no significant difference in e-learning usage between schools from the two regions. Though Kisumu Central has more users of e-learning resources, the users partially utilise them for academic purposes

5.2.3 Challenges faced by E-Learning Instruction in Primary Schools

The last objective of the study aimed at evaluating the challenges experienced in resource and usage of e-learning for instruction in primary schools from Kisumu Central and Muhoroni Sub Counties. The result revealed that;

i. Primary schools from both regions face equal magnitude of challenges in e-learning for instruction. (Figure 6).

ii. The challenges faced in e-learning for instruction seem to be experienced more in Muhoroni Sub County than in Kisumu Central, although the magnitude (*M*=18.33, *SD*=16.48 to *M*=17.33, *SD*=14.047) is minimal. (Table 10). This is so because the level of e-learning resource literacy is higher among the people who stay in Kisumu Central than Muhoroni Sub County.

iii. The t-test for statistical significance difference in challenges faced in e-learning for instruction between primary schools from Kisumu Central and Muhoroni Sub Counties revealed that there is no significant difference in challenges facing e-learning resources for instruction in primary schools from the two regions.

5.3 Conclusions

The researcher therefore makes the following conclusions from the findings of this study.

5.3.1 E-Learning Resources for Instruction in Primary Schools

In regard to e-learning resources for instruction in primary schools, the researcher makes the following conclusions:

i. Intellectual development refers to the stages attached to the cognitive growth of the child from birth to the age of 15 years. The first stage (from birth to 2 years) is the tender age when the child is sensitive to any sound or movement that communicate a message. The children in schools under study were found to encounter e-learning resources for learning and their sensitivity helped them build up concepts through their interaction with the e-learning resources.

ii. Kisumu Central has more of these e-learning resources than Muhoroni Sub County, ostensibly due to the difference in socio-economic strength in each region. Kisumu, being a town centre and an economic hub, has more infrastructures that support e-learning resource usage. Interpretation and analysis of data collected from study questionnaires and observation schedules show that the main e-learning resources that are available in primary schools are desk top computers, digital cameras, radios, laptops, and mobile phones.

iii. This difference in possession of e-learning resources does not however contribute to the difference in performance by pupils from schools in Kisumu Central and Muhoroni Sub Counties because they do not form the basis of content instruction.

5.3.2 E-Learning Usage for Instruction in Primary Schools

The researcher was also able to draw the following conclusions regarding e-learning usage for instruction in primary schools from Kisumu Central and Muhoroni Sub Counties:

i. Most respondents (in this case, pupils) reported having started listening to radios at early ages, while some started owning mobile phones as early as at 7 years of age. This corresponds with the concrete operational stage (7-11 years of age) when the child learns to attach certain linguistic codes to objects. He/she learns to call objects by name. This coding principle helps the child to attach concrete meaning to the things he/she comes in contact with. The skills of listening, reading and writing are exposed at this stage as being meaningful to the child.

ii. Majority of respondents (pupils who were found to be using e-learning resources) were aged 11 – 15 which is the formal operation stage. At this stage, the child has probably reached upper primary where the final Kenya Certificate of Primary Education examinations are done. The child begins to extract logical rules from the events and objects that he/she uses; develops the ability to apply logic to abstract thought, and the brain is prepared to take into account linguistic rules associated with word formation/vocabulary, sentence patterns, creative writing among others. The learner at this stage is able to apply these rules with regard to the exams context. All respondents who were pupils were selected from classes 7 and 8.

iii. The usage of e-learning resources is however low in the two regions studied (Kisumu Central and Muhoroni Sub County), according to the analysis and interpretation of the collected data. However, more pupils, teachers, and head teachers from Kisumu Central frequently use e-learning resources than their Muhoroni Sub County counterparts. The difference in the usage of e-learning

resources does not however contribute to the difference in performance by pupils from schools in Kisumu Central and Muhoroni Sub Counties.

5.3.3 Challenges faced in E-Learning for Instruction in Primary Schools

The last objective was set to evaluate challenges faced in e-learning for instruction in primary schools from Kisumu Central and Muhoroni Sub Counties. The problem solving approach involves problem selection and analysis, formulation of possible solutions, identification of relevant factors which are likely to influence the outcome of the proposed solutions, and the prediction of the possible outcome of the proposed solutions. The following conclusions were drawn by the researcher:

i. This study identified the problem of difference in performance in Kisumu Central and Muhoroni Sub Counties, and established that the factors that influence this problem include socio- economic background of pupils' parents, the location of the school (urban or rural), the school infrastructure and personal characteristics of both the teacher and the pupil.

ii. Whereas intellectual development theory explains the stages of cognitive growth of a child which culminates to the age where the child is able to apply rules in an exam context (at class 8), problem solving approach identifies the difference in performance between primary schools from Kisumu Central and Muhoroni Sub Counties and explains the factors influencing this problem (difference), thereby exposing areas where interventions should be carried out.

iii. Another problem identified by the study is the challenges faced in e-learning for instruction in primary schools from Kisumu Central and Muhoroni Sub Counties that needs to be solved by use of appropriate strategies. Comparatively, the challenges faced in resource and usage of e-learning for instruction in primary schools are felt more in Kisumu Central than in Muhoroni Sub County, as the analysed data portray. However, the difference in the challenges experienced in e-learning for instruction in primary schools under study is insignificant and cannot be attributed to the difference in performance by pupils or teachers from schools in Kisumu Central and Muhoroni Sub Counties.

5.4 Recommendations

The researcher makes the following recommendations for improvement and further research that should be done to improve e-learning for instruction in all primary schools in Kenya, so that the disparity that has been occurring in the availability, usage, and challenges in e-learning for instruction can be solved.

5.4.1 E-Learning Resource for Instruction in Primary Schools

i. The finding has shown that lack of adequate infrastructure to support e-learning resources usage is a major challenge to the use of e-learning for instruction in primary schools. Infrastructure like electricity, adequate buildings and furniture, alongside good fences should be provided to ensure functionality and safety of the devices by the County Governments. Electricity is essential in powering e-learning resources, while adequate buildings, furniture, and good fences will ensure safety of the gadgets.

ii. The government and other education stakeholders should also work towards acquiring e-learning resources for primary schools so that the teachers can use them for instruction. Initial costs for acquisition of these devices is very high and the school head teachers are not able to acquire them using school funds.

iii. The Ministry of Education should develop an e-learning resource provision policy for primary schools. This will ensure all schools are equipped with the resources throughout the country to aid in instruction.

5.4.2 E-Learning Usage for Instruction in Primary Schools

i. The education ministry should develop a comprehensive e-learning policy which is coordinated by the central government. This would ensure that appropriate e-learning resources are sourced and allocated to each school proportional to the number of pupils in each class within a particular school.

ii. On-line academic programs should be controlled from a central point to ensure uniformity in the provision of lessons and other class programs. There is also need to adopt a blended approach in e-learning. This means creating a learning environment that combines several methods. These include face to face interactions; self paced and individualized learning and online interactions.

iii. There is great need for education professionals to come up with a comprehensive e-learning syllabus to be in-cooperated in the primary schools curriculum. This will help in ensuring uniform efforts by teachers throughout the country in using e-learning resources for instruction in primary schools.

5.4.3 Improvement of E-Learning Resource and Usage for Instruction

i. Teacher training and curriculum development in line with the requirement of new technology (ICT) is essential in addressing the challenges faced in the implementation of e-learning for instruction in primary schools. The e-learning content must be aligned to the needs and expectations of the pupils. When they perceive that they can achieve their educational objectives and aspirations through the e-learning medium, they will be more willing and motivated to learn using e-learning devices.

ii. For the teachers to be able to give instruction using e-learning resources, they must possess appropriate technical skills in information technology. This will enable the teachers to provide instructions without fear of making mistakes in front of pupils. The government should develop an in-service programme that will see the teachers adequately trained in use of e-learning resources for effective classroom instruction. This could favourably be done during the school holidays or on weekends when teachers are not in full school sessions.

iii. A reward system for learners should be created. This is because learners require motivation to positively utilise e-learning resources for instruction purposes. Material rewards such as gifts should be introduced for learners who take active roles in using e-learning resources for doing their assignments so as to encourage others to do the same.

5.5 Areas for Further Research

Based on the findings of this study, the researcher recommends further studies in the following areas:

i. Given that e-learning resources and usage does not solely contribute to the difference in performance of pupils, a study should be carried out on the effect of teacher characteristics on instruction delivery by the aid of e-learning resources on the performance of pupils.

ii. There has been concerted effort in improving school infrastructure in Kenya. Therefore, a study should be conducted on the influence of educational infrastructure on instruction delivery by the aid of e-learning resources on the performance of pupils in schools from Kisumu Central and Muhoroni Sub Counties.

iii. More efforts have been put in sensitizing people on the importance of education. A study should be carried out on the effect of educational sensitization using e-learning on the enrolment of pupils in primary schools in both urban and rural areas of Kenya.

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APPENDICES

APPENDIX 1: LETTER OF INTRODUCTION

James Maloba,
Egerton University,
Faculty of Education & Community Studies,
Department of Psychology, Counselling and Educational Foundations,
P.O. Box 536,
Egerton.
Tel. 0722-940-267
E-mail: malobason@gmail.com

Dear Sir/Madam,

RE: RESEARCH

I am a Master's student at Egerton University currently carrying out a study in Comparative and International Education entitled; 'A Comparative Study of Availability of E-learning Resources and Pupils' Performance in Selected Primary Schools in Kisumu Central and Muhoroni Sub Counties, Kenya'.

I request you to help me collect data by duly filling the attached questionnaire. The information given will be treated with confidentiality.

Thanking you in advance,

Yours faithfully,

James Maloba

Researcher

APPENDIX 2: QUESTIONNAIRES FOR HEAD TEACHERS

Instructions: put a tick (√) against the choice(s) you make as is appropriate.

PART 1: DEMOGRAPHICS

1. Name your school _____

2. School Location: i). Kisumu Central ii) Muhoroni Sub County

3. State your Gender: i) Male; ii) Female

4. Age i. below 31 years ii. 31 – 40

iii. 41 - 50 iv. 51 years and above

5. For how many years have you been a head teacher? _____

6. Level of Education: i. Certificate ii Diploma iii Degree

iv. Other- Specify_____

PART 2: E-LEARNING RESOURCES

In regard to e-learning resource availability for instruction in primary schools, kindly express the level of your agreement or disagreement as: **1=Strongly Disagree (SD) 2=Disagree (D); 3=Undecided (U); 4=Agree (A); 5=Strongly Agree (SA)** to the following statements;

No	Items	1	2	3	4	5
1	The school has purchased enough desk top computers to aid instructions delivery					
2	Each and every member of the school is equipped with a mobile phone to ensure e-learning compliance.					
3	There are enough lap tops in the school to assist in information processing.					
4	Radios are readily available both in our school, homes.					
5.	Digital Cameras are available in the institution to be used in capturing information both in classrooms and outside classrooms.					
6	ICT gadgets like PDA, LCD/Projectors, iPods, white screens are normally available to teachers, pupils, administrators.					

PART 3: ICT UTILISATION

In regard to utilization of e-learning equipment for instruction in primary schools, kindly express the level of agreement or disagreement as: **1=Strongly Disagree (SD) 2=Disagree (D); 3=Undecided (U); 4=Agree (A); 5=Strongly Agree (SA)** to the following statements;

No	Items	1	2	3	4	5
1	Each and every pupil and teacher is equipped with a desk top computer for use during every lesson time					
2	Every member of the institution is allowed to use mobile phones for receiving of information in the school compound.					
3	The school has bought video recorders to be used in reviewing teacher-student classroom participation.					
4	The institution has bought enough projectors/LCDs to be used during instruction delivery					
5.	Radio programs are frequently used for delivering mass lessons in the school					
6	Lap top computers are utilized a lot by both teachers for instruction					

PART 3: E-LEARNING CHALLENGES AND RECOMMENDATIONS

Concerning the challenges faced in e-learning resource and utilization of e-learning equipment for instruction in primary schools, kindly indicate as: **1=Strongly Disagree (SD) 2=Disagree (D); 3=Undecided (U); 4=Agree (A); 5=Strongly Agree (SA)** whether the mentioned circumstances affect e-learning implementation most.

No	Items	1	2	3	4	5
1	The school has unreliable power supply					
2	Inability by teachers to use e-learning devices					
3	The institution allocates limited time for using the e-learning devices					
4	The Institution has few e-learning devices in school					
5.	The school do not allow teachers to offer assistance in e-learning to learners					
6	Non incorporation of e-learning programs in the education curriculum					

Thank you for accepting to give the information. Your comments about what is not covered in this questionnaire are welcome.

APPENDIX 3: QUESTIONNAIRES FOR TEACHERS

Instructions: put a tick (√) against the choice(s) you make as is appropriate.

PART 1: DEMOGRAPHICS

1. Name your school _____

2. School Location: i). Kisumu Central ii) Muhoroni Sub County

3. State your Gender: i) Male; ii) Female

4. Age i. below 31 years ii. 31 – 40

iii. 41 - 50 iv. 51 years and above

5. For how many years have you been a head teacher? _____

6. Level of Education: i. Certificate ii Diploma iii Degree

iv. Other- Specify_____

PART 2: E-LEARNING RESOURCES

In regard to e-learning resource availability for instruction in primary schools, kindly express the level of your agreement or disagreement as: **1=Strongly Disagree (SD) 2=Disagree (D); 3=Undecided (U); 4=Agree (A); 5=Strongly Agree (SA)** to the following statements;

No	Items	1	2	3	4	5
1	The school has purchased enough desk top computers to aid instructions delivery					
2	Each and every member of the school is equipped with a mobile phone to ensure e-learning compliance.					
3	There are enough lap tops in the school to assist in information processing.					
4	Radios are readily available both in our school, homes.					
5.	Digital Cameras are available in the institution to be used in capturing and relaying information both in classrooms and outside classrooms.					
6	ICT gadgets like PDA, LCD/Projectors, iPods, white screens are normally available to teachers, pupils, administrators.					

PART 3: ICT UTILISATION

In regard to utilization of e-learning equipment for instruction in primary schools, kindly express the level of agreement or disagreement as: **1=Strongly Disagree (SD) 2=Disagree (D); 3=Undecided (U); 4=Agree (A); 5=Strongly Agree (SA)** to the following statements;

No	Items	1	2	3	4	5
1	Each and every teacher is equipped with a desk top computer for use during every lesson time					
2	Every member of the institution is allowed to use mobile phones for receiving and dissemination of information in school compound.					
3	The school has bought video recorders to be used in reviewing teacher-student classroom participation.					
4	The institution has bought enough projectors/LCDs to be used during instruction delivery					
5.	Radio programs are frequently used for delivering mass lessons in the school					
6	Lap top computers are utilized a lot by teachers for instruction					

PART 3: CHALLENGES FACING UTILIZATION OF E-LEARNING RESOURCES

Concerning the challenges faced in e-learning resource and utilization of e-learning equipment for instruction in primary schools, kindly indicate as: **1=Strongly Disagree (SD) 2=Disagree (D); 3=Undecided (U); 4=Agree (A); 5=Strongly Agree (SA)** whether the mentioned circumstances affect ICT implementation most.

No	Items	1	2	3	4	5
1	The school has unreliable power supply					
2	Inability by teachers to use e-learning devices					
3	The institution allocates limited time for using the e-learning devices					
4	The Institution has few e-learning devices in school					
5.	The school do not allow teachers to offer assistance in e-learning to learners					
6	Non incorporation of e-learning programs in the education curriculum					

Thank you for accepting to give the information. Your comments about what is not covered in this questionnaire are welcome.

APPENDIX 4: QUESTIONNAIRE FOR PUPILS

Instructions: put a tick (√) against the choice(s) you make.

PART 1: DEMOGRAPHIC BACKGROUND

1 Name your school _____

2. School Location: i). Kisumu Central ii) Muhoroni Sub County

4. Gender i) Boy ii) Girl

5. Class i) Seven (7) _____ ii) Eight _____

6. Age _____

PART 2: E-LEARNING RESOURCES

In regard to e-learning resource availability for instruction in your school, kindly express the level of agreement or disagreement as: **1=Strongly Disagree (SD) 2=Disagree (D); 3=Undecided (U); 4=Agree (A); 5=Strongly Agree (SA)** to the following statements;

No	Items	1	2	3	4	5
1	The school has purchased enough desk top computers for pupils to aid instructions delivery.					
2	Each and every pupil in the school is equipped with a mobile phone to ensure e-learning compliance both at home and in school.					
3	There are enough lap tops in the school to assist both pupils and teachers in information processing.					
4	Radios are readily available both in our school, homes.					
5.	Digital Cameras are available in the institution to be used in capturing information to pupils both in classrooms and outside classrooms.					
6	E-learning devices like PDA, LCD/Projectors, iPods, white screens are normally available to teachers, pupils, administrators.					

PART 3: ICT UTILISATION

With regard to utilization of e-learning Resources both in school and at home, kindly respond to the following statements as as: **1=Strongly Disagree (SD) 2=Disagree (D); 3=Undecided (U); 4=Agree (A); 5=Strongly Agree (SA)** in accordance to frequency of utilization of e-learning devices.

No	Items	1	2	3	4	5
1	Each and every pupil is equipped with a desk top computer for use during every lesson time					
2	Pupils are forbidden from using mobile phones while in school					
3	Video recorders are frequently used to aid in reviewing pupils' classroom participation during lessons.					
4	Projectors/LCDs are frequently used during instruction delivery to us					
5.	Pupils often receive lessons frequently via radio programs delivered by various school programs					
6	Lap top computers are utilized a lot by teachers for instruction					

PART 3: E-LEARNING CHALLENGES AND RECOMMENDATIONS

The following situations that relate to the challenges faced in resource and use of e-learning devices. Kindly state the level of your agreement or disagreement as **1=Strongly Disagree (SD) 2=Disagree (D); 3=Undecided (U); 4=Agree (A); 5=Strongly Agree (SA)** according to how they (situations) affect implementation of e-learning programs.

No	Items	1	2	3	4	5
1	There is unreliable supply of electricity in our school					
2	Pupils are unable to use e-learning devices that are provided in school					
3	Pupils have little time in using e-learning devices					
4	There are few e-learning devices that can be used by all pupils for instructions					
5.	Teachers offer very minimal assistance to pupils on how to use e-learning devices					
6	The school curriculum and syllabus do not include e-learning lessons					

Thank you for accepting to give the information. Your comments about what is not covered in this questionnaire are welcome.

APPENDIX 5: OBSERVATION SCHEDULE FOR E-LEARNING DEVICES

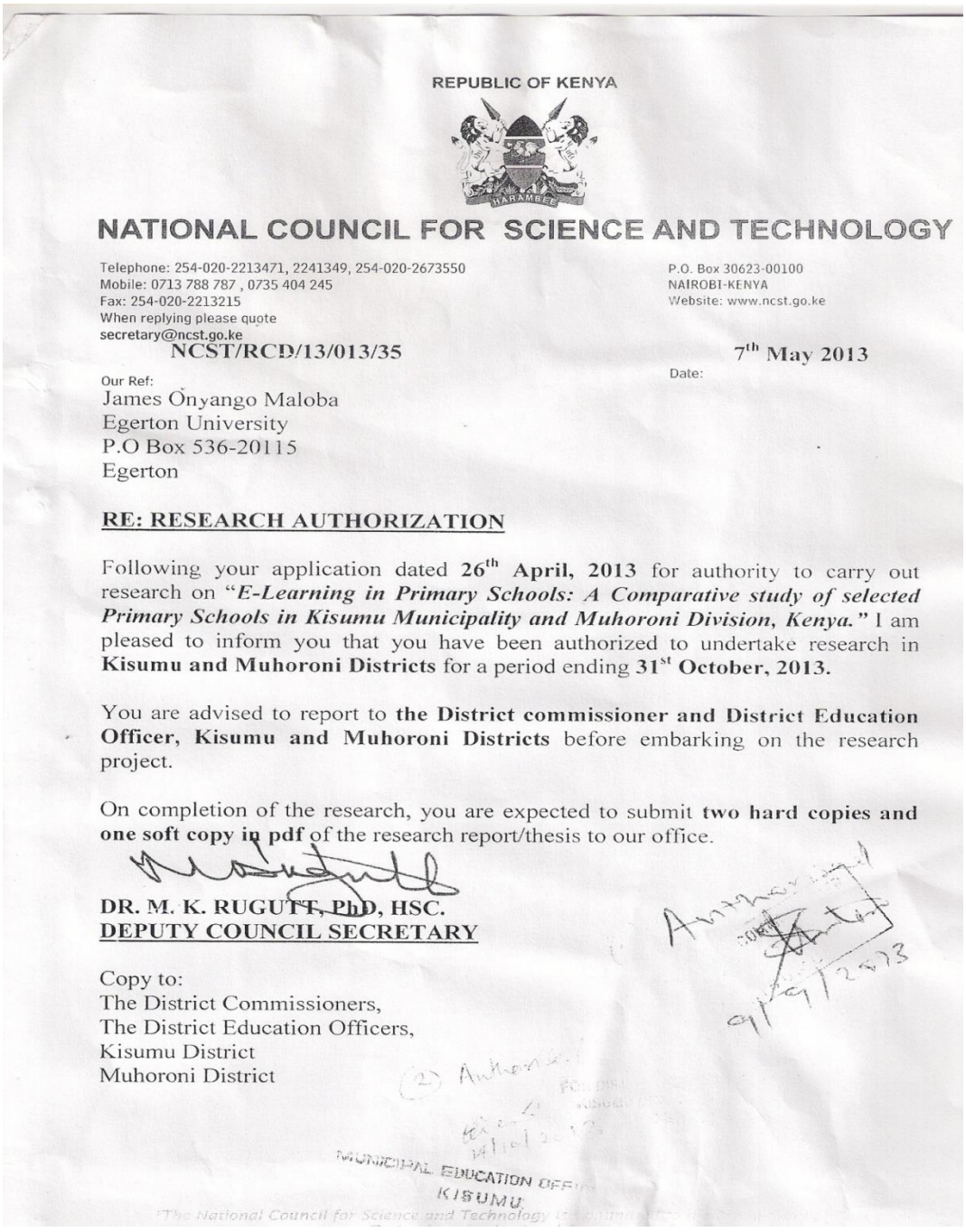
To be filled by the researcher

INSTITUTION :…… DATE :……

These are e- learning devices. Observe and tick appropriately

Device	Where used	
	In class	In office
Computers (laptop, desk top)		
Television sets		
Video players		
Radios (Hifi-system, cassette, world space receiver)		
Projectors (LCDS, Overhead Projector,		
CD Roms, VCD's, DVD's,		
Internet devices (cable, wireless connections)		
Flash disc		

APPENDIX 6: AUTHORIZATION FROM NACOSTI



REPUBLIC OF KENYA

HARAMBEE

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349, 254-020-2673550
Mobile: 0713 788 787 , 0735 404 245
Fax: 254-020-2213215
When replying please quote
secretary@ncst.go.ke

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref: NCST/RCD/13/013/35

Date: 7th May 2013

James Onyango Maloba
Egerton University
P.O Box 536-20115
Egerton

RE: RESEARCH AUTHORIZATION

Following your application dated **26th April, 2013** for authority to carry out research on ***"E-Learning in Primary Schools: A Comparative study of selected Primary Schools in Kisumu Municipality and Muhoroni Division, Kenya."*** I am pleased to inform you that you have been authorized to undertake research in **Kisumu and Muhoroni Districts** for a period ending **31st October, 2013.**

You are advised to report to **the District commissioner and District Education Officer, Kisumu and Muhoroni Districts** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. M. K. RUGUTT, PhD, HSC.
DEPUTY COUNCIL SECRETARY

Copy to:
The District Commissioners,
The District Education Officers,
Kisumu District
Muhoroni District

MUNICIPAL EDUCATION OFFICER
KISUMU

"The National Council for Science and Technology [illegible]

PAGE 2

THIS IS TO CERTIFY THAT:
Prof./Dr./Mr./Mrs./Miss/Institution
James Onyango Maloba
of (Address) Egerton University
P.O Box 536-20115, Egerton
has been permitted to conduct research in
Kisumu and Muhoroni Location
Nyanza Districts
Province
on the topic: E-Learning in Primary Schools: A Comparative study of selected Primary Schools in Kisumu Municipality and Muhoroni Division, Kenya.
for a period ending: 31st October, 2013.

Applicant's Signature

Secretary
National Council for Science &Technology

PAGE 3

Research Permit No NCST/RCD/13/013/35
Date of issue 7th May, 2013
Fee received KSH. 1,000

CONDITIONS

1. You must report to the District Commissioner and the District Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit
2. Government Officers will not be interviewed with-out prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2)/four(4) bound copies of your final report for Kenyans and non-Kenyans respectively.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

GPK6055t3mt10/2011

HARAMBEE

REPUBLIC OF KENYA

RESEARCH CLEARANCE PERMIT

(CONDITIONS—see back page)

APPENDIX 7: AUTHORIZATION FROM DEO, KISUMU EAST

MINISTRY OF EDUCATION

Telegrams:

Telephone: Kisumu (057) 2022626
When replying please quote

REF:KSM/E/MISC/11/(177)

REPUBLIC OF KENYA

DISTRICT EDUCATION OFFICE
KISUMU EAST
P.O. BOX 1914
KISUMU

4TH JULY. 2013

TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION
JAMES ONYANGO MALOBA

The above named is a student at Egerton University.

This is to confirm that, he has been granted authority to carry out research on ***"E-Learning in Primary Schools: A Comparative study of selected Primary Schools in Kisumu Municipality and Muhoroni Division, Kenya"***, *for* a period ending **31st October, 2013.**

Kindly accord him the necessary assistance.

DISTRICT EDUCATION OFFICER
KISUMU EAST DISTRICT

JOSEPH OCHIENG' ONDHORO
FOR: DISTRICT EDUCATION OFFICER
KISUMU EAST

APPENDIX 8: AUTHORIZATION FROM DEO, MUHORONI

MINISTRY OF EDUCATION

TEL:_____

WHEN REPLYING PLEASE QUOTE
REF: MHN/ED/ADM/29/12

DISTRICT EDUCATION OFFICE
MUHORONI DISTRICT
P.O. BOX 50
CHEMELIL
DATE: 01/08/2013

TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION

JAMES ONYANGO MALOBA

The above named is a student at Egerton University.

This is to certify that, he has been granted authority to carry out research on ***"E-Learning in primary schools:A Comarative study of selected primary schools in Muhoroni division, Muhoroni district"*** for a period ending **31st October**, 2013.

Kindly accord him the necessary assistance he may require to accomplish the assignment.

MUHORONI DISTRICT EDUCATION OFFICER
P. O. Box 50, CHEMELIL
02 SEP 2013
TEL: 0720 - 585341

JOYCE OWEKE
SUB- COUNTY DIRECTOR OF EDUCATION
MUHORONI SUB - COUNTY

APPENDIX 9: AUTHORIZATION FROM OP, MUHORONI SUB COUNTY

OFFICE OF THE PRESIDENT

Telegrams: .....
Telephone: .....
Fax: 020-2393643
When replying please quote
Email: dcmhrn239@gmail.com

DEPUTY COUNTY COMMISIONER,
MUHORONI SUB-COUNTY,
P.O.BOX17-40116,
CHEMELIL.

REF: **ADM /MHN/ED/17/14/VOL 1/40**

5/7/2013

JAMES ONYANGO MALOBA
EGERTON UNIVERSITY
P.O.BOX 536-20115
EGERTON

RE: RESEARCH AUTHORIZATION

Further to authority granted by the National Council for Science and Technology vide its letter NCST/RCD/13/013/35 OF 7th May 2013.

You are authorized to conduct research in Muhoroni Sub-County on the topic contained in the above quoted authority for the period ending 31st October 2013.

Make formal contacts with the management of respective institutions before making entry to their areas.

DEPUTY COUNTY COMMISSIONER
MUHORONI SUB - COUNTY

SOLOMON A. ABWAKU
DEPUTY COUNTY COMMISSIONER
MUHORONI SUB-COUNTY.