ASSESSMENT OF INTEGRATION OF E-RESOURCES IN TEACHING AND LEARNING OF ENGLISH LANGUAGE IN PUBLIC SECONDARY SCHOOLS IN KAKAMEGA COUNTY, KENYA

BY

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SCHOOL OF EDUCATION

MASENO UNIVERSITY

DECLARATION

DECLARATION

DECLARATION BY CANDIDATE:

This thesis is my original work and has not been presented in any other University for a Degree.

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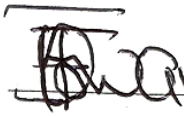
DECLARATION BY SUPERVISORS:

This thesis has been submitted for examination with our approval as University supervisors.



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DEDICATION

The thesis was dedicated to my late wife, Madam Racheal Mulati of Lugulu Girls' High School, who encouraged me to do my PhD and never got tired to pray for my success in life. I know you would have been very proud of me. Rest in Peace.

ABSTRACT

Integration of e-resources in education enhanced growth of knowledge based society. It created positive impact on curriculum implementation. Kenya invested in technology considerably with a belief to support and transform pedagogical practices. Despite innovative developments, there was little empirical evidence on use of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya. Incorporation of e-resources in the curriculum had not reached optimum level in the county. Insufficient attention to e-resources in teacher preparation programs limited their use. These concerns prompted Teachers Service Commission (TSC) to embark on capacity building of teachers for effective utilization of e-resources. The purpose of the study was to assess integration of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya. Specific objectives of the study were to: examine e-resources available for use in teaching and learning of English language, determine perceptions of principals, teachers and learners on e-resources in teaching and learning of English language, establish teacher preparedness on use of e-resources in teaching and learning of English language and examine e-resource pedagogic methods for use in learning of English language. The study was guided by Bruner's Constructivism Theory (1990) and adopted descriptive survey design. The study population was 150 principals, 250 teachers of English and 10,000 Form Two students. Simple random sampling method used to select 108 principals, 152 teachers of English and 370 Form Two students. Research instruments included: questionnaires for principals, teachers and students, interview schedule and observation checklist for teachers. Face validity of research instruments was established by judgement of three experts in the Department of Educational Communication, Technology and Curriculum Studies. Reliability of instruments was established through pilot study. The computed coefficients of reliability were 0.85, 0.85 and 0.80 for questionnaires of principals, teachers and students respectively. Data was analysed through descriptive statistics included frequencies, means and percentages. Statistical Package for Social Sciences (SPSS) was used to analyse data. The study found out that e-resources were available but inadequate for frequent use; e-resources ensured understanding of concepts (67.6%) and made learning lively (63%); teachers lacked computer and internet skills (58.3%) and learner-centred method supported with e-resources enhanced learning (72.4%). Based on the findings, the study recommended that Ministry of Education (MoE) should provide adequate e-resources; teachers should use e-resources appropriately to improve learning outcomes; MoE in conjunction with Kenya Institute of Curriculum Development (KICD) should organise refresher courses on e-resources usage and secondary schools should emphasize learner-centred method that uses e-resources in learning process. The study contributed to development of teacher of English in regard to technological innovation in the curriculum. It also provided additional information in formulating policies which will enhance use of e-resources in teaching and learning process.

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ACRONYMS AND ABBREVIATIONS

BECTA	British Educational Communications and Technology Agency
BOM	Board of Management
CD- ROM	Computer Disc Read only Memory
CDs	Compact Disks
DVDs	Digital Video Disks
EIRST	Electronic Information Resources Skills Training
ELEC	English Language E-resource Centre
EPMS	E-resource Pedagogic Methods Society
ETQ	English Teacher's Questionnaire
GoK	Government of Kenya
HOD	Head of Department
ICT	Information Communication Technology
ICTSS	Information and Communications Technologies In Schools Survey
KCSE	Kenya Certificate of Secondary Education
KICD	Kenya Institute of Curriculum Development
KLISC	Kenya Libraries and Information Services Consortium
KNBS	Kenya National Bureau of Statistics
LANs	Local Area Networks
LCD	Liquid Crystal Display
LQ	Learner's Questionnaire
MDGs	Millennium Development Goals

MoE	Ministry of Education
MUERC	Maseno University Ethics Review Committee
NGOs	Non-Governmental Organizations
NEPAD	New Partnership for Africa's Development
NZ	New Zealand
OHP	Overhead Projector
PCs	Personal Computers
PLE	Playful Learning Environment
PQ	Principal's Questionnaire
QASO	Quality Assurance and Standards Officers
RELEC	Regional English Language E-resource Centre
ROK	Republic of Kenya
SMS	Short Message Service
TIS	Teacher's Interview Schedule
US	United States
USSD	Unstructured Supplementary Service Data
VCRs	Videocassette Recorders
VLE	Virtual Learning Environment
CE.MA.S.T.E.A	Centre for Mathematics and Science and Technology Education in Africa
LELICO	Lesotho Library Consortium
T.V	Television
Wi.Fi	Wireless Fidelity

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

The study assessed integration of electronic resources (e-resources) in teaching and learning of English language in public secondary schools in Kakamega County, Kenya. The chapter laid the background to the study, statement of the problem, objectives of the study, research questions, limitations and assumptions of the study and theoretical framework. The scope of the study was discussed and operational definition of key terms was included.

1.2 Background to the Study

Integration of e-resources created positive impact on curriculum implementation. E-resources improved teaching and learning process immensely. They required computer access, whether through personal computer, mainframe or handheld mobile devices. They were accessed remotely via the internet or locally. The study determined key issues for e-resources collection development in Netherlands libraries (Johnson, Evensen, Gelgand, Lammers, Sipe & Zilper, 2012). The research of Ruth (2014) indicated that despite good access to e-resources, their use were variable within and between departments. This indicated lack of awareness of available e-resources in the curriculum. She gathered data through use of Virtual Learning Environment (VLE) logs, questionnaire, group interviews and document analysis. However, the current study used interview schedule, observation checklist and questionnaire. Ruth's study targeted integration and use of Information Communication Technology (ICT) across a large secondary school in South West of England. Thus, single case study offered no basis for reliability or generality of the results (Krusenvik, 2014). On the contrary, the current study used descriptive survey design to collect data in 108 public secondary schools in Kakamega County, Kenya.

In accordance with International Federation of Library Associations (IFLA) (2015) e-resources included materials that required use of a peripheral (for example, a CD – ROM player) attached to a computer. They offered opportunities for enhancing strategic learning. The study focused on libraries and intellectual freedom of access to information. The results of Vinod (2015) suggested that majority of respondents (90.67%) were aware of e-resources use in education. This provided opportunities to students to use them adequately. Vinod's research concentrated on use of e-resources and services by users at Indian Institute of Management Kozhikode. Furthermore, technology based education depended on speed of broad band, availability of web enabled and mobile compatible learning. This helped students to access e-content easily. The research determined barriers to utilizing ICT in education in India with a special focus on rural areas (Arnab & Dey, 2018). Contrarily, Sampath (2018) study evaluated digital divide in India and pointed out that only 20.7% rural and 69.7% urban students used computer for academic purposes in India. The results revealed inadequate use of computers especially by rural students. This was because (Chetna, 2015) new technologies were scarcely used in Indian schools. Certainly, when used in teaching they increased productivity and retention rates. Chetna's study targeted ICT and quality education in Indian schools.

The research of Dumrique and Castillo (2017) assessed impact of online gaming on academic performance and social behaviour of the students in Polytechnic University of the Philippines – Laboratory High School. It noted that even though students played online games; they socialized and performed very well. There was a significant relationship between academic performance of the respondents and playing online games during weekends. Weekends were the days when the respondents had their pleasure time for recreational activities. Therefore, this strengthened the home and school partnership to supervise the students' activities. They

used descriptive – correlation method which utilized questionnaire to collect data. The high school students were selected through purposive sampling whereas the present study adopted descriptive survey design and simple random sampling method. In the study of Malakar, Chakravorty and Debasish (2019) suggested that excessive internet gaming exerted harmful effect in psychological functioning as anxiety and depression were higher among high gamers. They examined how excessive internet gaming behaviour influenced development of anxiety and depression among college students. They collected data from undergraduate students of Kolkata City in India. Nonetheless, the present study used principals, teachers and Form Two students to collect data.

As reported by Batchelor and Nocrish (2005) study technological resources consisted of hardware, software, networks and media for collection, storage, processing, transmission and presentation of information. They were generally accepted because of the ease of usability, readability, affordability and accessibility. The research based on framework for assessment of ICT pilot projects. Accordingly, Purcell, Lee, Buchanan, Linda, Amanda, Chen and Zickuhr (2012) research confirmed that teachers encouraged online research. It included the use of digital technologies such as cell phones to find information quickly. Moreover, three quarters of Advanced Placement (AP) and National Writing Project (NWP) teachers suggested that internet and digital search tools had positive impact on students' research habits. This study assessed how teens did research in the digital world. Another study by Sophia (2016) observed that most students were going online for homework. Secondary schools parents (81%) supported that internet made it easier for children to get their homework done. The majority of parents also agreed that using the internet for homework, research or educational games helped children to prepare for the future. Therefore, it allowed children to learn at their own pace, and were less likely to be left behind in class. Sophia's

research focused on students' use of internet for homework. She used a qualitative approach unlike the present study used both qualitative and quantitative research approaches.

The research of Oberiri and Iyendo (2018) investigated the place of internet in academic research and learning of students. They used 250 undergraduate students in three selected universities within North – Eastern Nigeria. To gain an in – depth understanding of the perception of the students' views, a focus group was conducted with 18 students. In their research, students perceived that lack of digital readiness among staff and inefficient internet facility discouraged utilization of the internet in the institutions. However, Nawe and Kiondo (2005) study showed that quality of teaching and learning improved significantly as a result of ICT application in library operations. The use of internet increased the scope of reading and promoted self-learning. They concentrated on impact of ICT application in library services provision in University of Dares Salaam. Moreover, Halima (2011) study observed that respondents preferred e-resources because they were time saving and informative in education thus improved knowledge amongst students. Halima's study focused on use and impact of e-resources. She sampled lecturers, research scholars and students of the University of Lagos in Nigeria.

The study of Tella (2011) examined availability and use of ICT in South Western Nigeria Colleges of Education. It revealed non-availability of e-resources in the curriculum. Inadequate attention to e-resources in teaching process narrowed its use. Tella's study analyzed data quantitatively using Statistical Package for Social Sciences (SPSS). Just as Taban, Abdullah and Che (2012) study, most teachers did not get enough ICT training opportunities. This undermined access and retrieval of technological information during teaching and learning process. They targeted difficulties faced by teachers in using ICT in

teaching – learning at technical and higher educational institutions of Uganda. They adopted descriptive survey design with quantitative analysis. Additionally, they designed questionnaire for teachers and administrators only. The current research used questionnaire for principals, teachers and Form Two students to collect data. It also used interview schedule and observation checklist for teachers. Therefore, the present study applied triangulation method which reduced bias and increased rate of certainty of the research findings (Karim, 2007) unlike Taban *et al*., (2012)study which used single method of data collection.

Accordingly, Olatoye (2011) study considered learning with ICT as an active process. It enhanced peer-learning as well as ameliorated student's examination preparation. He concentrated on levels of participation in ICT training programmes, computer anxiety and ICT utilization among selected professionals. The research of Habiba and Salma (2012) found that the overall user satisfaction levels of ICT varied from user to user. The accessibility to ICT tool was crucial since their availability enabled teachers to utilize them. The study targeted use of e-resources and its impact on library users. It used a questionnaire to collect data. As stated by Ngimi (2013)study, ICT was used to a limited extent in delivery of education. Challenges identified included lack of pedagogical competence of lecturers and inadequate infrastructure. Ngimi's study focused on opportunities and challenges for integrating ICTs in education delivery in the Institute of Continuing Education at the Open University, Tanzania. It employed multiple holistic case research design. Both Ngimi (2013) and Kihoza, Zlotnikova, Bada and Khamisi (2016)studies observed similar challenges however; Kihoza *et al.,* (2016) research targeted classroom ICT integration in Tanzania. It comprised teacher trainees and tutors from Morogoro Teacher Training College and Mzumbe University both of Morogoro region. This study involved quantitative research approach only. The current study used108 schools in Kakamega County, Kenya. Conversely, Ngimi

(2013) and Kihoza *et al.,* (2016) studies used one and two institution(s) in Tanzania respectively.

ICT enabled students to investigate, receive feedback, understand, build knowledge and demonstrate greater retention during learning process. Integration of ICT made teachers and students become partners in learning process. It enhanced cooperation, collaboration and teamwork in the curriculum. This study determined influence of ICT on learning among secondary schools in developing countries in Africa. It was a case study of secondary schools in Kashenshero Sub-County in Uganda (Asiimwe & Byensi, 2017). Further, modern ICT products included e-mail, fax, electronic bulletin boards, cellular phones, video conferencing among others. In particular, modern ICT products were grouped by Landon, Hite and Mugimu (2013) study into three categories: administrative (86%), entertainment (45%) and pedagogical (45%). Though administratively, ICT primarily attracted students thus increased revenue in schools. The study focused on ICT in Ugandan secondary schools. They used stratified sampling method to identify seven schools; four additional schools were also purposively sampled based on high levels of ICT in schools in Mukono, Uganda. To the contrary, the current study used simple random sampling method to select 108 schools.

Integration of e-resources in education was introduced recently in developing countries such as Kenya (MoE, 2006)consequently; teachers encountered numerous challenges which influenced negatively learning outcomes. ICT challenges included unawareness of any training on use of e-resources, lack of computers, poor connectivity and unfriendly interfaces. This was a manual on national ICT strategy for education and training in Kenya. Likewise, the Ministry of Education (MoE) (2012) reported that many learners lacked digital skills and abilities to join tertiary education. Thus, the report emphasized knowledge production

however knowledge reproduction was discouraged in schools. The approach was introduced to increase engagement among learners and learning among learners in the curriculum. This was a task force report on the realignment of the education sector to the Constitution of Kenya 2010. In the research of Kato (2020) simple linear stepwise multiple regression results indicated that ICT methodology and its motivation had an insignificant impact on Student-Centred Learning (SCL). Therefore, school managers must improve on ICT methodological motivation through embracing modern ICT teaching techniques and learner involvement in handling various technologies for learning process. The study established the extent to which ICT methodological motivation had led to SCL skills among public secondary school students in Bungoma County, Kenya. Descriptive and inferential statistics were used whereas the current study used only descriptive statistics which included frequencies, means and percentages.

According to Wasilwa (2016) study teacher's positive attitude towards computer, computer teaching experience and personal entrepreneurship of the teacher had a direct positive influence on innovative use of ICT by the teacher. The study focused on teacher factors influencing application of ICT in learning of History and Government in secondary schools in Bungoma South Sub-County, Kenya. It used quantitative tools only to collect data. On the authority of Cheruiyot (2017) study revealed that most secondary schools concentrated on using ICT resources in teaching and learning process. The mode of learning was ICT enhanced thus simplified learning of abstract content. Cheruiyot's study targeted extent of ICT integration in public secondary schools in Westlands Sub-County, Kenya. He used the Theory of diffusion and innovation by DeGross (2008) which involved communication, time, innovation and social system whereas the current study used Bruner's Constructivism Theory (1990) which encouraged interactive learning process. In spite of that, Manaszumbah and

Magoma (2015) study noted that integration of ICT in Physics instruction in schools in Nairobi was still very low. Consequently, Physics subject recorded low performance. They determined integration of ICT in teaching secondary school Physics. It used simple random sampling method to select sample size of 18 schools and 52 Physics teachers. Moreover, purposive sampling was used to select 18 principals. On the contrary, the current research used simple random sampling method to select 108 principals, 152 teachers of English and 370 students.

The research by Barasa, Barasa and Omulando (2020) affirmed that teachers perceived that ICT helped in pre-planning and post planning of instruction, made learning concepts more concrete and increased desire to learn in education. The study determined integration of ICT in planning for instruction in early learning in Bungoma County, Kenya. It involved Early Childhood Development (ECD) teachers, education officer in-charge of ECD in the county and public primary school headteachers. Another study by Chililia (2020) also acknowledged that ICTs encouraged individualized instruction and made teaching easy and efficient. The research examined ICT infrastructural support available and its influence on instruction in lower primary school classes. It targeted headteachers, teachers and Sub-county Quality, Assessment and Standards Officers (SCQASOs). Nevertheless, Indembukhani (2021) study expressed that there was un-coordinated training on ICT integration and biasness in training of teachers in the curriculum. Therefore, this limited use of technology in learning process. The study targeted integration of ICT and its contribution to the teaching of English in secondary schools in Kisumu County, Kenya. He used sample size of 43 teachers, one County Quality Assurance and Standards Officer (CQA&SO) and 10 principals.

The results of Muvango, Indoshi and Okwara (2019) pinpointed that there was inadequate use of media in learning process. Insufficient attention to use of media in teaching process

influenced negatively learning outcomes. They considered financial constraints as a challenge to implement media in the curriculum. The study determined factors influencing use of media in teaching and learning of English in public secondary schools in Kakamega East Sub – County, Kenya. Further, Muvango et al., (2019) results were in line with the report of KNEC (2020).The report monitored learners' progress in 2019 and showed that students' mastery of English language skills was low. Significantly, KNEC(2017) report had called for innovation in curriculum implementation. The innovation lay not per se in integration of e-resources, but in its role as a contributor towards a student-centred form of learning process. This was 2017 KCSE examination report in Kenya. Commensurate with Ayere, Odera and Agak (2010) research, students responses revealed that more than half were never taught languages using any electronic media, even though more than half of them were taught sciences using ICT.100% of the students also experienced ICT related learning on a weekly basis in science related subjects unlike in languages. They focused on e-learning in public secondary schools in Kenya; case study of NEPAD e-schools. They adopted both descriptive survey and ex-post-facto designs.

Conforming to Muyaka (2012) report, Kenyan ICT policy made it a requirement for institutions to integrate ICT in order to support and transform learning outcomes. This report targeted ICT infrastructure and teacher preparedness in integration of ICT in education. Consequently, ROK (2018) report focused on impact of e-resources and the need for attainment of National Education goals and Vision 2030. It identified that ICT policy recognized digital literate workforce as foundation on which Kenya would become knowledge-based economy. Additionally, ICT Strategy for Education and Training (MoE, 2006) and Kenya Institute for Curriculum Development (KICD) (MoE, 2005) were established and mandated to implement integration of technology in education. Reported

achievement included ICT Integration Training Manual was developed (MoE, 2012). It showed superiority of e-resources over auditory presentation. E-resources demonstrated a positive influence on motivation and academic achievement notwithstanding, it was disappointing that most schools used technology sparingly. The study of Miima (2014) observed that Kakamega County was one of the largest counties with many public schools equipped with e-resources. On the contrary, there was inadequate integration of ICTs in teaching and learning of Kiswahili language .Interestingly, the researcher did not come across any empirical evidence on integration of e-resources in teaching of English in the county. Therefore, it was from this background that the present study assessed integration of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya.

1.3 Statement of the Problem

Education systems in today's world, Kenya included, were tailored toward achieving Millennium Development Goals(MDGs) and Vision 2030 which embraced integration of technology in all operations and sectors such as education. Kenyan government invested in technology considerably with a belief to support and transform learning outcomes. Despite the effort, there was little empirical evidence on integration of e-resources in teaching of English language in public secondary schools in Kakamega County, Kenya. The county was one of the largest counties with many schools equipped with e-resources recommended by KICD. Integration of e-resources in teaching of English language had not reached optimum level in the county. Therefore, it was not clear whether teachers of English in schools in the county were using e-resources or not in the curriculum. The research problem addressed in the study was that despite technological developments in education, there was little integration of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya. The study showed that integration of e-resources in

teaching and learning of English language improved learning outcomes. Contrariwise, as much as teachers liked to use various e-resources regularly for instruction, they faced inadequate e-resources, negative attitudes towards use of e-resources, limited e-resources skills and challenge of selecting suitable e-resource pedagogic methods for use in learning of English language.

1.4Purpose of the Study

The purpose of the study was to assess integration of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya.

1.5 Objectives of the Study

The objectives of the study were to:

1. Examinee-resources available for use in teaching and learning of English language in public secondary schools in Kakamega County, Kenya.
2. Determine perceptions of principals, teachers and learners on e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya.
3. Establish teacher preparedness on use of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya.
4. Examine e-resource pedagogic methods for use in learning of English language in public secondary schools in Kakamega County, Kenya.

1.6 Research Questions

The following research questions guided the study to assess integration of e-resources in teaching and learning of English language:

1. What are the e-resources available for use in teaching and learning of English language in public secondary schools in Kakamega County, Kenya?
2. What is the perceptions of principals, teachers and learners one-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya?
3. What does teacher preparedness on use of e-resources have on teaching and learning of English language in public secondary schools in Kakamega County, Kenya?
4. What are the e-resource pedagogic methods for use in learning of English language in public secondary schools in Kakamega County, Kenya?

1.7 Significance of the Study

The study assessed integration of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya. It contributed to development of teacher of English in regard to technological innovation in the curriculum. It created awareness of available e-resources in the curriculum. The study also provided opportunities to students and teachers to use e-resources adequately. This study emphasized use of pedagogical methods supported with e-resources in order to meet individual student's needs in education. The results of the study were useful to teachers of English language, Quality Assurance and Standards Officers (QASO), English language developers and education and training policy makers in providing information for improving integration of e-resources in the curriculum. Finally, the study generated new knowledge which provided additional

information in formulating policies which will enhance integration of e-resources in teaching and learning of English language.

1.8Assumptions of the Study

The following were the assumptions:

i. That the environment for teaching and learning of English language was the same in all public secondary schools.
ii. That all schools received quality assurance services on integration of e-resources in teaching and learning of English language.
iii. That the attitude of teachers and students toward use of e-resources was positive. The study assumed that both the teachers and their learners were exposed to them.

1.9 Limitations of the Study

Limitations were shortcomings anticipated by the researcher, included:

i. The study did not use actual observation of teachers integrating e-resources in teaching and learning of English language. Therefore, the findings may not reflect the actual teaching and practice.
ii. The study focused on public secondary schools only thus the results may not resonate with private secondary schools in regard to integration of e-resources in teaching and learning process.

1.10 Scope of the Study

The scope of the study was Kakamega County, Kenya. The study was confined to 108 sampled public secondary schools in the county. Although integration of e-resources was the keystone of the curriculum implementation, it had not reached optimum level in the county. The researcher did not come across any empirical evidence on use of e-resources in teaching and learning of English language in schools. However, the county was one of the largest

counties with many public secondary schools equipped with e-resources recommended by KICD(Miima, 2014). It was not clear whether teachers of English in public secondary schools in the county were using e-resources or not in the curriculum. It was imperative to assess why this was so in the county. The current study assessed integration of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya. The study selected public secondary schools because of their uniformity in acquisition, selection and use of e-resources in the curriculum. E-resources were acquired by the Government of Kenya (GoK) through MoE, NEPAD projects, Non-Governmental Organisations (NGOs), schools managements and sponsors.

1.11Theoretical Framework

The study was guided by Bruner's Constructivism Theory (1990). The theory was based around the idea that learners were active participants in their learning journey; knowledge was constructed based on experiences (Kurt, 2021). Therefore, there was a close relationship between Constructivism Theory and integration of e-resources; the implementation of each one benefited the other. Constructivists stated that learning took place in contexts while integration of e-resources referred to the designs and environments that engaged learners. The basic idea of constructivism (Gilakjani, Lai& Hairul, 2013; Jamalahdin et al., 2017) was that knowledge must be constructed by the learner. The role of constructivist teacher was to construct a learning environment that was invigorating, interactive, immersive and informative.

E-resources were cognitive tools that helped students process the critical thinking and to transform it into beneficial learning (Jonassen, 2000). Constructivists placed particular emphasis that teaching and learning must be learner-centred. Interactivity was away of focusing students' interest. Learning process was found to be practical with learner

interactions and activities based learning. Studies showed (Long, 1996) that interaction was a stimulus for effective learning outcomes.

A highly valued method of imparting prescribed knowledge, skills and attitude was through the development and promotion of effective use of learner-centred pedagogies supported with e-resources to enhance learning in the cognitive, affective, physical and aesthetic domains. The teacher was a facilitator and the learner the main centre of interesting learning process (Mechlova & Malcik, 2012). Constructivism Theory addressed four major aspects: (1) predisposition towards learning, (2) the ways in which a body of knowledge was structured so that it can be readily grasped by the learner, (3) the most effective sequences in which to present the material and (4) the nature and spacing of rewards and punishments (Pagan, 2006).

Both Bruner and Piaget Constructivism Theory considered children active participants in the learning process. Like Piaget, Bruner noted children had an innate capacity and that cognitive abilities developed through active participation(Hashman, 2013). However, Bruner disagreed with Piaget that development of language was a cause not a consequence of cognitive development. Children were naturally ready to learn language. Constructivism Theory challenged learners to be critical thinkers and the teacher should be a mentor, consultant and coach. The theory enabled learners to: develop skills and confidence to analyse the world around them, create solutions or support for developing issues and justify their words and actions. The theory emphasized what learners know and the teacher should relate it to what they teach.

Integration of e-resources enabled learners to communicate and interact effectively amongst learners so that they could learn from incorporation of their experiences. Studies showed that when teachers involved learners, better results were achieved (Rita & Birgit, 2005). Learners played the key role in learning while teachers only helped them to develop the necessary knowledge and skills that enabled them handle life issues and tasks independently (Metto & Ndiku, 2014). Hence, educational technology (Veletsianos & Moe, 2017) developed various forms of strategies, systems, programmes and machines to meet educational needs and aspirations of learners.

In conclusion, Constructivism Theory helped the researcher to understand how teachers and learners used previous knowledge, experience and available e-resources creatively to gain new knowledge in education. Therefore, constructivism supported the philosophy of learning which enabled student's understanding in the curriculum.

1.12 Operational Definition of Terms

Key terms in the study were defined as follows:

Assessment	Referred to the process of gathering and discussing information in order to develop a deep understanding of integration of e-resources in teaching and learning of English language.
Cables	Denoted essentially carrier or media through which data flows. These are networking hardware used to connect one network device to other network devices or to connect two or more computers to share printers and scanners.
Constructivism	Meant the process of getting new knowledge or ideas with prior knowledge in order to make sense or meaning. Constructivism will be equivalent to getting knowledge through integration of e-resources.
English Curriculum	Signified the English language content taught in a certain cycle of education. The content related with the objectives of education in the country, aims, teaching methods and evaluation of English subject as provided by MoE through KICD.
English language	Compulsory subject in primary and secondary schools in Kenya and examined by Kenya National Examinations Council (KNEC). It is also the official language of communication in Kenya as well as the medium of instruction in our schools, colleges and universities.
E-resources	Applied to all forms of electronic media that supported learning and teaching process. These were KICD recommended e-materials/technological resources. They included computers,

	laptops, video, OHP, radio, CD-ROM discs, camera, video cassette recorder (VCR), televisions (TVs), e-readers, mobile phones, internet sources, DVDs and CD discs. E-resources also included multimedia elements such as text, image, animation, streaming video and audio in learning environment.
E-Pedagogic methods:	Pertained teaching methods supported with e-resources in learning of English language such as student-centred method.
ICT	Attributed tos haring information through the use of technology. The study considered information as English content being shared and technology which included communication devices or applications encompassing radio, TV, computer, network hardware and software, satellites, broadband communication and mobile phones capable of transmitting data.
Integration	Meant incorporation of e-resources in teaching and learning of English language. On yet another scale, integration meant that no language skill should be taught in isolation.
Internet assignment	Referred to online tests or quizzes, practice exercises, essays (submitted online) and online literature searches. Students covered content and did activities outside of class time so as one spent in-class time in other ways. For example, pre-class quiz highlighted problematic areas to focus on during class time. This reduced in class hours if online activities planned well.
Local Area Network	Indicated a computer network that inter-connects computers within a limited area such as a school or offices building. Simply, it is a collection of devices connected together in a school or offices.

Learning	Referred to process of acquiring new knowledge, attitudes and skills in the curriculum.
Perceptions	Meant willingness, perceived constraints and teachers own reservations about integration of e-resources. The study considered principals', teachers' and learners': perceptions, interest, attitude and beliefs of using e-resources in English curriculum.
Software drills	Instructional method supported with e-resources characterized by systematic repetition of concepts, examples and practice problems.
Teaching	Was actual instruction process in a classroom situation which involved the teacher and the learners.
VCR	An electromechanical device that records audio and video from broadcast TV on a magnetic tape videocassette. It is used to record a TV program to play back at convenient time.
Web 2.0	Referred to social media sites such as Facebook, video sharing sites (like You Tube) and Twitter.
Webinar	A seminar presented over internet.
Wi-Fi	Meant a facility which allowed computers, smart phones, or other devices to connect to the internet or communicate with one another wirelessly within a particular area.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter presented literature review under the following headings: Availability of e-resources for use, perceptions of e-resources, and teacher preparedness on use of e-resources and e-resource pedagogic methods for use in learning of English language. The headings were in line with objectives of the study.

2.2Availability of E-resources for use

The study of Oak (2016) considered e-resources as systems in which information was stored electronically and made accessible through electronic systems and computer networks. They covered wide range of devices such as CD – ROM discs, internet sources, mobile phones, televisions, radio, OHP and videos. Oak's study dealt with measuring the users' expectations in the libraries of Management Institutions recognized by Savitribai Phule Pune University(SPPU) in India. The study used the LibQUAL+ technique for the data collection purposes. Moreover, Kenchakkanavar (2016) research specified that e-resources were easily accessible in remote areas. They were important for the academic community thus print sources were being digitized. This paper presented an overview of e-resources, described their advantages and disadvantages. On the contrary, respondents in Tarus, Gichoya and Muumbo (2015) study were not satisfied with availability of e-resources in learning institutions'-resources available were limited for frequent use in education. Insufficient e-tools impacted negatively on students' research habits. They researched on challenges of implementing e-Learning in Kenya. It was a case study of Kenyan Public Universities.

Tutors used word processors regularly for pre-planning and post-planning of pedagogic activities in education. It was used to make lesson notes, schemes of work, record of work covered, timetables and departmental minutes. The study concentrated on teachers'

preparedness in integrating ICT in training teachers in public primary teacher training colleges in Central Region, Kenya. It used quota sampling, stratified sampling and simple random sampling techniques (Omariba, 2016). However, the study of Miima (2014) showed that computers were inadequate in schools. Consequently, both teachers and students could not access most of e-resources in the curriculum. Miima's study focused on schools with computers for teaching and learning of Kiswahili language. The study targeted 45 public secondary schools in Kakamega County, Kenya. As reported by Muvango*et al.,* (2019) study,100% teachers did not register presence of computer-mediated materials as available in their schools. Therefore, they were rarely used in education. The study determined use of media in teaching English in secondary schools in Kakamega East Sub-county, Kenya. As a result, the research of Gathoni *et al.,* (2011) recommended that efforts be made towards upgrading and increasing the existing infrastructure for better connectivity. The study monitored and evaluated e-resources in academic and research institutions in Kenya. It adopted purposive sampling method. On the contrary, the present study used simple random sampling method.

The research of Ngeze (2017) revealed that most teachers (77%) possessed either a laptop or a smartphone. They used internet to acquire majority of e-resources. Websites gave them ability to download materials and shared their work easily. Ngeze's research concentrated on ICT integration in teaching and learning in secondary schools in Tanzania. It used questionnaire to collect responses from 32 schools. Importantly, different schools utilized different e-resources depending on availability of equipment. Respondents in Thanuskodi (2012) study however, pointed out limited e-resources in their respective subjects. The research targeted use of e-resources by students and researchers of Faculty of Arts, Annamalai University. It used questionnaire only to collect data. The study of Ayere *et al.,*

(2010) determined e-learning in secondary schools in Kenya; case of NEPAD e-schools. According to the study, principals and ICT HODs showed that all students (100%) in NEPAD schools accessed electronic materials for educational research. At the same time, only a few students from non-NEPAD schools (17%) accessed e-materials for educational research. This pointed out a major difference in accessibility levels of students from NEPAD and non-NEPAD schools. It was clear that non-NEPAD schools attempted to use NEPAD schools ICT facilities for educational research. Saturated sampling method was used for six NEPAD schools. Six non-NEPAD schools were also selected through simple random sampling method. The present study used simple random sampling method to select 108 public secondary schools.

Many dictionaries, encyclopaedias and other reference sources were available as CD-ROMs. Educational software on CD-ROM gave learners alternative ways to practise language skills. Some of CD-ROMs had complete lessons or texts that a teacher manipulated to facilitate teaching process (Sharndama, 2013). Sharndama's study targeted applications of ICTs in teaching and learning English in large classes. It used qualitative approach only. Further, the study of Kabate (2016) revealed that CD-ROMs were used in schools. Educational CD-ROMs as multimedia technologies were advantageous due to their interactive nature. The study assessed integration of ICT particularly educational CD-ROM as modern tool in education. It focused on early childhood education in Tanzania. This was literature review on the potentials of CD-ROM and was linked to the constructive approach of learning. Contrarily, the research of Cevher-Kalburan, Tarakci and Omeroglu (2011) determined use of CD-ROM in early childhood education in Denizli, Turkey. They indicated that teachers used CD-ROMs in classrooms very rarely due to inadequate computer equipment. The study used qualitative research methods whereby semi-structured interview was employed to collect

data. They also conducted the research using five early childhood teachers who taught different age groups of children.

Teaching and learning resources were accessible online through computers and mobile devices. Teachers accessed e-resources remotely via internet or locally. This observation was based on ways cloud computing was changing the education sector (Stone, 2019). Hence, the internet was most extensively used channel to acquire majority of e-resources. Examples of www browser software were Microsoft's internet Explorer, Mozilla Firefox, Google Chrome, Opera and others. Information on internet was used by learners as references. Students accessed more and up to date information through internet than other sources such as textbooks. The study by Sendall, Ceccucci and Peslak(2008)stipulated that web 2.0or social media sites allowed students to share information. The research analysed implementation of web 2.0 in the classroom. However, the study of Becta (2008) noted that nearly all students' use of Web 2.0 was outside school, for social purposes. Few pupils had an understanding of ways in which Web 2.0 was used for educational purposes. Becta's survey focused on learners' use of Web 2.0 technologies for learning at KS3 and KS4 in and out of school. Vital stakeholders such as teachers and schools managers were left out in their study. The current study involved principals, learners and teachers.

Finlayson*et al.,* (2006)research hinted that computers were rarely used in mathematics and sciences; due to unavailability of equipment. Learning institutions should provide adequate e-materials for effective teaching and learning process. Finlayson's study targeted eLearning in further education and selected students only. Moreover, the study of Miima (2014) targeted integration of ICTs in teaching and learning of Kiswahili language in public secondary schools in Kakamega County, Kenya. She revealed that students' computer ratios ranged

between 1:10 to 1:15. The results showed inadequate use of computers in schools. Both Miima (2014) and the current study used stratified proportional sampling method to categorize schools in the county. Miima's study targeted three categories of secondary schools namely national, county and sub-county whereas the current study used four categories: national, extra-county, county and sub-county schools. According to Smerdon, Cronen, Lanahan, Anderson, Iannotti and Angeles (2011) observation, insufficient number of computers prevented teachers from using them in teaching process. The research focused on teachers' tools for the 21st Century although they left out principals and learners in their analysis.

2.3Perceptionsof E-resources

The study of Dahlstrom (2019) concentrated on digital writing tools from the student perspectives. It revealed that word processors developed positive attitudes toward writing process. Students used computers to write stories. The affordances of digital writing increased student agency consequently, contributed to equity in writing activities. The study used statistical survey and qualitative interviews. Six classes from five different schools located in municipality in the middle of Sweden were chosen as an informant group. Furthermore, Atieno, Ayere and Rabari (2019) research targeted influence of integration of ICT on performance in Chemistry among public secondary schools in Kisumu County, Kenya. It indicated that ICT when well utilized had positive influence on education. They considered Form Four students, chemistry teachers and principals in their study. The respondents in Muvango, Indoshi, Okwara and Okoti (2020) study expressed that media made learning memorable (70%), provided life experiences in classroom (50%), set mood in teaching of English language (55%), made learning clear (60%) and helped learners to develop critical thinking during learning process (60%). Therefore, e-resources improved learner's knowledge in the curriculum. The study focused on perceptions of teachers on

media use in teaching and learning of English in public secondary schools in Kakamega East Sub-County, Kenya. It used saturated sampling method to select 20 headteachers and 40 teachers. The study also used simple random sampling to select 500 students.

Integration of e-resources provided opportunities for teachers and students to work better in an information age. E-resources were advantageous because of easy access, interactive nature and search capacities(Kantharaj, Prasanna & Deepak, 2012) consequently influenced learning outcomes. This observation based on effective usage of e-resources in the curriculum. As reported by Mua (2016) study, teachers used ICT resources for research thus improved knowledge in the subject areas. They also increased interaction, cooperation and collaboration in education. Mua's research was case study of two Cameroonians secondary schools. The study determined use of ICT in teaching and learning process. The research of Earp (2021) verified that students who played one to two hours of video games a day on weekdays were 13% more likely to get higher reading scores than those who did not play at all. Gaming on weekends was also positively associated with academic performance. However, when usage increased to more than four hours students were 15% less likely to get higher reading scores. Internet was not harmful to academic performance if used moderately. Therefore, timing of internet was a factor that needed to be considered. The research targeted association between internet use, electronic gaming and National Assessment Program – Literacy and Numeracy (NAPLAN) of 11 – 17 years old.

The study of Muvango*et al*., (2020) established perceptions of teachers on media use in teaching and learning of English in public secondary schools in Kakamega East Sub-County, Kenya. It revealed that 96.6% learners strongly agreed (80%) agreed (16.6%) that English language concepts were well understood when media was incorporated in learning process.

Instructional media helped students to learn concepts in the curriculum. Another study of Jamalahdin*et al.*,(2017)insinuated that e-resources increased learning among learners, enhanced participatory learning and communication however; they used qualitative research approach only. They targeted role of ICT in learning – teaching process. Pursuant to Ayere *et al.,* (2010) study, 61% of students suggested that information search contributed positively to their academic improvement. They identified significant differences in academic performance of NEPAD and non-NEPAD schools attributed to e-learning. The study analysed data using both descriptive and inferential statistics whereas the current research used only descriptive statistics. They targeted Form Four students whereas the present research selected Form Two students.

Communication via internet was instantaneous, interactive and far reaching in the curriculum. Teachers used internet to access e-resources for teaching process. E-resources facilitated learning of abstract concepts and provided quality information to both teachers and students. This study determined electronic resources usage at Ashesi University in Ghana. A questionnaire based survey was utilized (Dadzie, 2005).According to Turner, Elizabeth, Mansureh, Sally and Heflich (2018) study digital games in courses had benefits in areas of academic achievement. They developed problem solving and critical thinking skills. They also promoted students' confidence, satisfaction, interest and effort. This was literature review of 77 articles conducted using the procedure developed in Cooper's Taxonomy (1998).Nevertheless, the research of Irteja, Raaj and Rasheda (2020) noted that addiction tendency to internet and electronic gaming was found to be adversely associated with academic achievement. Therefore, there was need for parental monitoring or self-regulation to limit the timing and duration of electronic-gaming. This was in order to overcome the detrimental effects of internet use and electronic game play on academic achievement. The

study examined association of internet use and electronic game-play with academic performance respectively on weekdays and weekends on Australian child. They used a cross – sectional nationwide survey.

The research of Norton and Hathaway (2010) examined teacher – learners' reflection about the use of video production in their K-12 classrooms. The findings demonstrated positive content learning outcomes as measured by objective tests, rubrics and anecdotal evidence. Integration of video production facilitated connections to content, student motivation and engagement, the use of alternative assessment and shifts in teacher identity. Also, video production played important role in content learning. Data were primarily narrative in form, thus selected a qualitative research approach to data analysis. Further, Wijnker, Bakker, Tamara and Drijvers (2018) study stated that videos that posed questions were associated with an increase in student's interest. In addition, highly informative videos with authoritative speakers were associated with an increase in students self-reported conceptual knowledge gains. The study included seven science teachers, 13 videos and 233 students aged 13 – 18 years. They interviewed teachers, analysed video, administered questionnaire to students and did a cross – analysis which connected all data.

Furthermore, research of Geer and Sweeney (2012) noted that technological resources played a key role in how students learnt, gained information and interacted with others. E-materials enhanced also teamwork in the curriculum. The study explored use of student's voice in an Australian Primary School as a valid method to inform teachers about what tools best supported students in their learning. Focus groups, questionnaires and drawings identified technologies, strategies and settings that helped students to learn. The study of Kisirkoi (2015) indicated that 56% teachers reported that teaching using computers raised students'

creativity in learning process. They encouraged learner-centred activities such discussion, questions and answer, debates and role plays. Kisirkoi's research focused on integration of ICT in education. It adopted case study design. Finally, in Kisirkoi's research, questionnaires were filled by teachers only. To the contrary, in the present study principals, teachers and Form Two students filled questionnaires. Moreover, it administered interview schedule and observation checklist to teachers.

2.4Teacher Preparedness on use of E-resources

The study of Teemu, Mekitalo-Siegl, Sini, Susanna and Henriikka (2012)implied that learners, teachers and education managers relied heavily on e-resources for efficacy however; there was a myriad of issues and challenges that arose from integration of e-resources in the curriculum. They targeted challenges faced with new teachers' use of ICT in teaching and learning process. Moreover, the research of Tarus *et al.,* (2015) observed that 87% of respondents considered financial constraints as a challenge to implement e-learning in education. They determined challenges of implementing eLearning; a case study of Kenyan Public Universities. Based on Nomsa (2013) research, schools did not have enough funds for maintenance and support of computing facilities. Both Nomsa and the present research used descriptive survey design. Nomsa's research also used systematic sampling method on schools of four regions. It concentrated on challenges faced by schools when introducing ICT in developing countries. He administered closed ended questionnaire to 42 high schools that taught ICT unlike the present study administered both open and closed ended questionnaire to 108 schools.

Consistent with Buabeng-Andoh (2012) research e-resources adoption and integration was inadequate in teaching and learning process. This was attributed to teacher's lack of computer

skills which limited integration of ICT in the curriculum. He did literature review of factors influencing teachers' adoption and integration of ICT into teaching process. Another study by Anyango (2017) indicated teachers had average and students had low ICT competencies. Also, it conveyed that both teachers and students had neutral attitudes on ICT integration. This showed that both teachers and learners had inadequate e-resources skills for use. Anyango's study focused on factors influencing ICT integration in teaching and learning of Geography in secondary schools in Rachuonyo South Sub-County, Kenya. Significantly, Berhanu(2010)research emphasized that introduction of e-resources without setting up required ICT infrastructure and sufficient support mechanism threatened technological development in the curriculum. Hence, inadequate ICT infrastructure hindered implementation of e-learning in education. The study targeted a model for an eportfolio-based reflective feedback; case study learning in developing countries.

Furthermore, Isiakpona and Ifijen (2012) study asserted that majority of universities libraries had inadequate basic infrastructure for effective electronic information services. The major challenge involved in the provision of e-resources among the university libraries was electricity power outage. Electricity was required in order to use e-resources sufficiently. They targeted availability of e-resources for service provision in University libraries in Ogun state Nigeria. It used stratified random sampling technique to collect data. According to observation of Wambugu (2015f) computers, printers and Wireless Fidelity (Wi-Fi) routers alone accounted for around 25% of electricity bill. This observation was based on how to tame silent energy vampires. The study by Oduwole and Akpati (2003) indicated inadequate electricity supply despite high demand at the University of Agriculture Library Abeokuta, Nigeria. They focused on accessibility and retrieval of electronic information. This was a case study. They had only 425 participants responded out of the survey sample size of 1000

thus obtained 53.87%response rate however, the current research obtained 100% response rate.

The study of Jagboro (2003) observed that 45.2% of respondents accessed internet from cybercafés though this was due to proximity of cybercafés to user facilities. This revealed lack of necessary ICT infrastructure in institutions. The study targeted internet usage in Nigerian Universities. He used a case study of Obafemi Awolowo University. Another survey signalled that teachers' highest percentage of training received was 75% for computer literacy and 50% for using computers for teaching and learning process (Nikiwe, 2007). This indicated that teachers had average e-resource skills for content delivery. Nikiwe's research focused on challenges faced by secondary schools teachers integrating ICT into the curriculum. It used multiple case study research design. He administered questionnaire and semi-structured interviews to teachers. Nevertheless, teachers should develop positive attitudes toward the technological innovation (Peralta & Costa, 2007) in order to offer effective teaching through ICTs. Teachers' technical competence with computer improved confidence in the use of technology. They researched on teachers' competence and confidence regarding use of ICT. Focus group interview was the central data collection technique used in their study.

Installation of technology inevitably brought with it need for staff development courses and the cost of such courses was expensive for most schools. This was a research based on use of multimedia in education (Abhaya, 2014).In accordance with Muvango *et al.*, (2019) study, 70% teachers never attended an in-service training course since professional certification; lack of funds was a major reason of not attending. The study established use of media in teaching and learning of English in 20 public secondary schools in Kakamega East Sub-

County, Kenya. Significantly, ICT skills of both teachers and students (Wakhu, 2013) were deterrent to integration of e-resources in teaching and learning process. Information literacy was necessary for integration of e-resources in the curriculum. 76.9%, 69.2% and 59.6% of teachers could not use scanner, printer and Liquid-Crystal Display (LCD) projector respectively. Therefore, lack of computer or internet skills was a reason for not incorporating internet media into pedagogic practice. The research of Wakhu focused on framework for integrating ICT in teaching and learning in secondary schools in Kajiado County, Kenya. The current study used 108 schools however; Wakhu's study purposively sampled 15 schools.

The research of Chililia (2020) confirmed that 58% headteachers could not acknowledge that ICTs made teaching easy and efficient. This was attributed to their lack of interacting with ICTs during and after training. Chililia's research examined infrastructural support available for ICT integration in curriculum practices at lower primary school classes in Bungoma County, Kenya. The research centred on Rogers (2003) Theory of diffusion of Innovation unlike the present study used Bruner's Constructivism Theory (1990). According to Kisirkoi (2015) study, every new teacher was allowed to join evening computer literacy classes to acquire computer skills. Therefore, teachers computer literacy status gave them confidence to teach supported with technology. Kisirkoi's study targeted integration of ICT in education in a secondary school in Kenya. She adopted case study design. Another study of Ouma, Kembo and Ayere (2019) communicated that 56.4% sampled teachers had attended general computer literacy courses at various institutions of learning. Hence, the courses covered during training had nothing to do with integration of e-resources in education. Besides, 44.3% of the sampled schools had no teacher trained in computer skills by their colleagues as was expected. This study focused on teacher's computer capacity in public primary schools in Homa Bay County, Kenya. It involved headteachers and teachers only.

The research by Hruskocy, Cennamo, Ertmer and Johnson (2000) noted that students' expertise in computer use impacted on teachers' integration of computers in the classroom. Thus, students became technology experts for teachers and peers. This study focused on creating a community of technology users whereby elementary students were considered. Participants responded to an open-ended questionnaire. Accordingly, Ajuwon (2003)study found that use of data base was inadequate, due to insufficient training. Teachers needed knowledge about technology and content in order to successfully support students' learning with ICT resources. Ajuwon's study based on computer and internet use by first year clinical and nursing students in Nigerian Teaching Hospital. It used questionnaire only to collect data. As reported by Ghavifekr and Rosdy (2015) study, professional development training programs enhanced students' quality learning in education. It improved teacher's ICT skills in the curriculum. This study concentrated on teaching and learning with technology and effectiveness of ICT integration in schools. The study considered teachers of both primary and secondary schools but the present research considered principals, teachers of English and Form Two students of public secondary schools.

2.5 E-resource Pedagogic Methods

Integration of e-resources was considered as a medium in which a variety of pedagogic methods were implemented in the curriculum. E-resource pedagogic methods utilized affordances of digital information and communication technologies. The research determined challenges for using ICT in Education (Hadi & Zeinab, 2012). Moreover, the study of Carolyn, Timothy, Homer, Tse – Yang and Yi – Hsuan (2017) revealed six categories of teaching strategies during analysis of studies: Questionnaire strategies (0.74); manipulation strategies (0.57); enhanced material strategies (0.51); inquiry strategies (0.48); instructional

technology (IT) strategies (0.48) and collaborative learning strategies (0.98). All effect sizes were judged to be significant. The analysis depicted that interactive educational methods connected learning to needs of students. Effective teaching strategies offered the teacher with aids to produce positive learning outcomes. Participation helped to realize tasks and provided cooperation among teachers and learners. The report focused on effects of teaching strategies on student achievement in science in United States. It was Meta-analysis of US research published from 1980 to 2004.

According to Corcoran (2009) study, pedagogic methods were characterized by certain regularities in the ways in which teachers and students interacted with each other. It focused on effective policies and programs for children in high school. The observation made by Gill (2013) noted that learner-centred method was effective because provided students with a discussion environment where problems were solved cooperatively. Education was moving from instructing towards constructivism supported with e-resources. Interactive learning made learners to discover their own capabilities and expertise through a greater cooperative effort and exchange of knowledge. Gill's research targeted effective teaching methods for classroom. Effective teaching strategies were ranked as follows: lectures (5%), reading (10%), demonstrations (30%), group discussions (50%), practical activities (75%), peer teaching and immediate use of knowledge in practice (90%). The study established that student-centred activities produced high level learning outcomes. They promoted interaction, collaboration, teacher-learner connectedness and cooperation during learning process. The research used pedagogical experience, regular observation and continuous contact with students to conclude that interactive methods and ICT tools raised student's interest in learning. The study targeted use of ICT teaching-learning methods in Mathematics (Aija & Inga, 2012).

Constructivism Theory emphasized methods that increased learner autonomy and creativity in the curriculum. This encouraged learners to place importance on regular interaction with other learners and teachers. The study focused on effective pedagogic approaches for online workplace training and it adopted case study research design (Ian, Mark &Kozak, 2007). Additionally, learner centred strategies included: cooperative learning, inquiry-based instruction, interactive learning and differentiated instruction. The strategies were regarded more effective since they did not centralize the flow of knowledge from the teacher to the student. Learners got meaning of something from new experiences they encountered in life. The new experience emerged from interaction amongst learners using e-resources. This was an observation on teaching strategies in the curriculum (Janelle, 2018). Based on Rita and Birgit (2005) study, multimedia based stories and discussions in class supported change in education. From pedagogical point of view, when learners were involved, better results were obtained. They targeted blended learning in a teacher training course. Students completed two online questionnaires in their study whereas the current research administered questionnaires physically to principals, teachers of English and Form Two students.

Blended approaches encouraged collaboration, self – learning and discovery learning. Students were motivated to contribute in discussions, either verbally or in written form. This research concentrated on learner – centred pedagogy in Sub-Saharan Africa, Addis Ababa in Ethiopia (Vavrus, Thomas & Bartlett, 2011). According to the study of Herodotou, Sharples, Gared, Kukulska-Hulme, Rienties and Denise (2019) formative analytics, teach back and place-based learning effectively contributed to the development of skills and competences such as critical thinking, digital literacy, group work and affective development. Other pedagogies that supported interactive learning included playful learning, exploration and

dynamic assessment during which assessors supported learners in identifying and overcoming learning difficulties. The approaches were supported by effective educational theories such as experimental, inquiry, discovery and self regulated learning, all of which were participatory and engaged learners. They supported learning process and desirable learning outcomes in both the cognitive and emotional domain. This study targeted innovative pedagogies of the future thus an integrated framework was developed to select the pedagogies.

Researchers at Johns Hopkins University conducted a systematic review of evidence on the effectiveness of pedagogical approaches used. The biggest gains were associated with instructional process programs that involved cooperative learning and mixed – method programs that combined large group and small group instruction with computer activities. The analysis focused on effective policies, programs and instruction in American high schools (Corcoran, 2009).Further, the research of Zhao, Wei and Yu-Sheng (2021) centred oninnovative pedagogy and design-based research on flipped learning in higher education. Task – Driven Instructional Approach in the Flipped Classroom (TDIAFC)was designed and implemented for two groups of participants in an undergraduate hands-on making course in a Playful Learning Environment (PLE). One group consisted of 81 students as the Experimental Group (EG) received flipped learning instruction, and another group of 79 students as the Control Group (CG) received lecture – centred instruction. The experimental results demonstrated that students in the EG got higher scores of summative tests and final scores than those in the CG. In particular, students' learning performance in three domains (cognitive, affective and psychomotor) differed significantly between the two groups.

Therefore, innovative pedagogy integrated with a PLE supported with technology produced positive learning outcomes. The learning performance was evaluated by the learning evaluation framework designed as a questionnaire based on Bloom's Taxonomy of domains.

Integration of technology was achieved when teachers demonstrated use of classroom computer during whole and small group lessons. Small group discussions were irreplaceable forum for teaching and learning using e-resources. From a socio-cognitive perspective, children who observed and interacted with teachers internalised relevant vocabulary. The study considered best practices in literacy instruction (Lesley, Linda & Pressley, 2003). Moreover, teaching should actively engage students as primary participants. The use of cooperative learning included activities that helped students to develop their evaluation skills, critical thinking skills and practice on real tasks and working out decisions. This study targeted effect of cooperative learning on student's Mathematics. It also addressed achievements and attitude towards mathematics (Zakaria, Chin & Daud, 2010). The research of Kutnik (1994) observed that student's groupings within classrooms were a constant social pedagogic factor which effected participation and learning process. Kutnik's study focused on use and effectiveness of groups in classroom. It used small sample size of 47 schools in England unlike the current study used 108 public secondary schools in Kakamega County, Kenya.

Learner – centred pedagogy generally drew on learning theories which suggested learners should play an active role in learning process. In the classroom setting, learner talk, teacher talk and the arrangement teachers made promoted learning process. Feedback also led learners to modify their output. However, feedback that provided guidance was more instructionally effective than feedback that simply told learners whether their answers were right or wrong. Through a review of literature, this study targeted factors that hindered the use of learner-centred methods in Kenyan public primary schools (Metto & Ndiku, 2014). Besides, students liked to work in groups or teamwork with interactive media. Interactive e-resources formed cooperation between learners' efforts. Contrarily, whole class teaching was

effective when teachers frequently asked students to explain and to elaborate key ideas, rather than merely lecture. This increased learner's engagement and interaction during learning process. This study focused on international evidence and a discussion of some good practice in Ugandan Primary Schools (O'Sullivan, 2006).

The report of Teo and Wong (2000) revealed that teacher-centred method was least practical, more theoretical and memorizing. However, learner-centred method produced positive learning outcomes because it was participatory in nature. This report was a reflection on problem based learning in Asia. The research of Ahmed (2017) targeted the impact of effective teaching strategies on producing fast and good learning outcomes. It emphasized that education methods should promote: active process of cognition that developed skills of learning, creative use of knowledge and skills of self assessment, cooperation and indulgence to different points of view. The study distributed questionnaire among lecturers at An-Najah National University. Just as Graham and Perin (2007) study, group arrangements allowed students to work together and had learning effect on writing quality. This improved teamwork, cooperation and peer learning in the curriculum. They conducted rigorous Meta-analysis of 123 studies of instruction in writing, all of which used experimental or quasi-experimental designs. They focused on writing skills only unlike the current study considered integrated approach to teaching of English language supported with e-resources. Therefore, language skills such as listening, speaking, reading and writing should complement each other so as to produce communicative competent learners (ROK, 2015).

CHAPTER THREE

RESEARCHMETHODOLOGY

3.1 Introduction

The chapter comprised research design, area of study, study population, sampling techniques and sample size, instruments for data collection, validity, reliability, data collection procedures and data analysis procedures.

3.2 Research Design

The study employed descriptive survey design. The researcher complemented qualitative with quantitative research approach. Therefore, the study maximized strengths and minimised limitation of each approach (Orodho, 2009). The approach was appropriate because it identified level of effectiveness of integration of e-resources in the curriculum. Descriptive survey design was economical and had rapid turnaround in data collection (Creswell, 2003). It was used to collect information by interviewing and administering questionnaire to sampled individuals (Orodho, 2003).The design also involved identification of attributes of large population from small group of individuals (Bhat, 2020).It described, recorded and reported condition as it existed (Shona, 2019, Kothari, 2008). The principals, teachers and students were asked about their perceptions and attitudes (Mugenda & Mugenda, 2003) towards integration of e-resources in education. In the study, descriptive survey design explored the nature of integration of e-resources, challenges encountered by teachers and how they affected teaching and learning process. Furthermore, it suggested ways of improving integration of e-resources in teaching and learning of English language.

3.3 Area of Study

The study was conducted in Kakamega County, located in western region of Kenya bordering Bungoma to the North, Trans Nzoia to the North East, Uasin Gishu and Nandi Counties to the East, Vihiga to the South, Siaya to the South West and Busia to the West. According to Kenya National Bureau of Statistics (KNBS) (2012) the county had population of 1,660, 651 and an area of 3,033.8 km^2. Its poverty index stood at 53%, in comparison with national level which was 45.9%. The county was divided into 12 sub-counties. It was one of the largest counties in Kenya. The county was ranked position 26 out of the 47 counties naturally in terms of poverty levels. The reasons for high poverty level included reduced agricultural yields due to poor farming methods, changed weather patterns, collapsed sugar industry and poor infrastructure (ROK, 2014). The temperatures ranged from a minimum of 10.3c to a maximum of 30.8c with an average of 20.5c. The rainfall ranged between 1,250 – 1,750 mm per annum. Main economic activities were large scale and mixed farming and commercial businesses.

The county resources included arable land and forests. Moreover, it had a few tourist attractions cites such as Kakamega Forest, caves and crying stone. Rural electrification project had availed electricity at most market centres and learning institutions (ROK, 2009) .The County had institutions of higher learning, middle colleges, secondary and primary schools. The percentage of passable roads stood at 54.1%. Impassable roads influenced negatively integration of e-resources in the curriculum. Lack of utilization of e-resources also impacted negatively on learning process.

Administratively, the county was divided into five educational divisions: Kakamega South, Kakamega North, Kakamega Central, Kakamega East and Kakamega West. Secondary

schools enrolment stood at 19,380. It had 150 public secondary schools equipped with KICD recommended e-resources. The e-resources were acquired by the government through the Ministry of Education (MoE), NEPAD Projects, NGOs, schools management and sponsors. This study assumed that both the teachers and their learners were exposed to them.

Although integration of e-resources was the key stone of the curriculum implementation, it had not reached optimum level in Kenya especially in the county. The county was one of the largest counties with many public secondary schools equipped with e-resources recommended by KICD. However, there was little empirical evidence on integration of e-resources in teaching and learning of English language in public secondary schools in the county. It was not clear whether teachers of English in public secondary schools in the county were using e-resources or not in English Curriculum. Therefore, it was imperative to assess why this was so in the county.

3.4 Study Population

The entire targeted population of the study consisted of 10,000 Form Two students, 250 teachers of English and 150 principals of public secondary schools in Kakamega County, Kenya. Therefore, the total targeted population for the study was 10,400 individuals. The county had the following categories of public secondary schools namely national, extra-county, county and sub-county which were equipped with KICD recommended e-resources in the curriculum.

The current study selected public secondary schools because of their uniformity in acquisition, selection and use of e-resources. E-resources were acquired by the GoK through MoE, NEPAD projects, NGOs, schools managements and sponsors. The study purposively sampled out Form Two cohorts because it was at this level where intensive teaching and

learning was done (Ambuko, 2008, Muvango, 2011).Principals were chosen because they implemented and supervised integration of e-resources in schools. They also enforced government policy on ICT training amongst teachers. Finally, based on the nature of the problem under the study; teachers of English were selected as a unit of study due to the fact were point of focus and influential in teaching process in schools, thus caused change easily in the curriculum. They(CEMASTEA, 2019) were directly involved in the process of selection and use of e-resources in the curriculum. Teachers had close contact with learner therefore best people to give views about the system.

3.5 Sampling Techniques and Sample Size

Simple random sampling method was used to select sample size of 370Form Two students from a total of 10,000; 108principals from a population of 150 and 152 teachers of English from a population of 250(The Research Advisors, 2006, Krejcie & Morgan, 1970). The sampling frame data of the public secondary schools was obtained from Kakamega County Education Office.

Ten schools were selected randomly for pilot study. From these, 10principals, 20 teachers and 30 students were selected randomly for pilot study. According to Hill (1998), Isaac and Michael (1995) suggested 10 to 30 participants for pilot study in survey research. The small scale preliminary study assessed feasibility, cost, duration, adverse events and improved descriptive survey design prior to performance of full – scale research (Thabane, Ma, Chu, Cheng, Ismaila, Rios, Robson, Thabane, Giangregorio & Goldsmith, 2010).

The study purposively sampled out Form Two cohorts because it was at this level where intensive teaching and learning was done. At Form One level, the learners were introduced to

new concepts in English language. Finally, at Form Three and Form Four levels; teachers drilled students in readiness for the national examinations (Muvango, 2011).

Simple random sampling method was used to select teachers and students from 108 public secondary schools. Stratified proportional sampling method was used to represent schools in the county in four categories namely national, extra-county, county and sub–county. This improved the representativeness of the sample by reducing the sampling error. Therefore, in accordance with Asher (1995) stratified proportional sampling method was reliable with a high degree of representativeness. For each sampled school, a class register was used. The odd – even method was used whereby every 3^{rd} 5^{th} 7^{th} 9^{th} and so on was sampled. The number of students in each class varied between 45 – 70 students per class. The researcher selected 370 Form Two students that were used in the study. Proportional Representation Values were also used to achieve fairness in data collection. The following formula was used: $\frac{x}{10000} \times 370$: Whereby: **x** represented total of Form Two population in a school. Table 1 showed sample frame.

Table 1: Sample Frame

Category	Total population (*N*)	Piloting number	Sample selected number (*n*)
Principals	150	10	108
Teachers	250	20	152
Students	10,000	30	370
Total	**10,400**	**60**	**630**

Source: Kakamega County Education Office (2021)

3.6 Instruments for Data Collection

Instruments used in primary data collection were questionnaire and interview schedule. Secondary data was collected by observation checklist.

3.6.1 Questionnaire

The questionnaire was used as main instrument in primary data collection. It was preferred because it provided confidentiality and allowed researcher to reach large sample size within short time and with no extra personnel. Furthermore, questionnaire provided information regarding integration of e-resources in teaching and learning of English language. The researcher administered questionnaire to principals, teachers and students in 108 public secondary schools. The principals' role on integration of e-resources included: provision of funds for purchasing and maintenance of e-resources and enforcement of government policy on ICT training in the curriculum. The questionnaire had two sections: A and B, with both closed and open ended questions. Section A comprised short answer questions basically related to the respondents background whereas section B comprised questions on integration of e-resources.

The questionnaire administered had the following format: a) Unstructured open – ended questions, gave the opportunity to respondents to provide in-depth information and to express their feelings about integration of e-resources in teaching and learning of English language; b) Structured closed-ended questions provided clear picture on integration of e-resources in the curriculum. It saved time and resources; c) Contingency questions enabled respondents to answer questions which they had capacity to handle; d) Matrix questions assisted researcher as it used space economically and efficiently. It enabled data analyzed easily, and e) Demographic questions provided vital information on background of the respondents on their education, gender and experience in the curriculum.

The researcher distributed questionnaires for principals and teachers of English himself and collected four days later. It gave respondents enough time to respond at their convenience. This enabled 100% rate of return of questionnaires. The students' questionnaires were distributed to them through the assistance of teachers English in the sampled schools. The researcher requested the teachers to assemble students in the hall, explained to the students his expectation before filling the questionnaire. The students were given one hour to respond to the questionnaires and then the researcher assisted by their respective teachers to collect them as they left the hall. This enabled 100% collection of the questionnaires.

3.6.1.1Principal's Questionnaire (PQ)

The principal's questionnaire had section A with 3 items and B with ten items. Section A of questionnaire comprised general information of public secondary schools. Section B comprised open-ended questions and closed ended questions based on a Likert-type rating scale with five rating scale. The principals filled in the blank spaces and also placed a tick in the appropriate spaces that corresponded with their responses. The PQ provided information regarding integration of e-resources in teaching process. Significantly, principal(through Board of Management (BOM), parents, sponsors and school community) played crucial role in the mobilization, supervision and implementation of integration of e-resources in the curriculum. The PQ attached as Appendix C.

3.6.1.2 English Teacher's Questionnaire (ETQ)

Teacher's questionnaire had section A with three items and B with 14 items. Section A of the questionnaire comprised general information of public secondary schools. Section B comprised open ended questions and closed ended questions based on a Likert type rating scale with five rating scale. The teachers filled in the blank spaces and also placed a tick in the appropriate spaces that corresponded with their opinion. Teachers of English were chosen

because of their significant role in selection and use of e-resources in the curriculum. ETQ was used to collect data on integration of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya. ETQ was attached as Appendix D.

3.6.1.3 Learner's Questionnaire (LQ)

Learner's questionnaire had section A with two items and B with seven items. Section B comprised open ended questions and closed ended questions based on a Likert type rating scale: Strongly Agreed (SA), Agreed (A), Disagreed (D), Undecided (U) and Strongly Disagreed (SD). The students filled in the blanks and also placed a tick in appropriate spaces that corresponded with their opinion. LQ provided information on use of e-resources in the curriculum. Form Two students were chosen because at Form One level, learners were still being introduced to new concepts in English language while Form Three and Form Four levels; teachers drilled learners in readiness for national examinations. However, the study purposively sampled out Form Two cohorts because it was at this level where intensive teaching and learning was done. The LQ was used to gather information on background of student's knowledge, attitudes and views about integration of e-resources in teaching and learning of English language. LQ attached as Appendix E.

3.6.2 Observation Checklist (OC)

Observation Checklist (OC) contained nine items. It comprised closed ended items only. The researcher placed a tick in the appropriate spaces that corresponded with observation made. OC was used as a confirmatory tool. It confirmed the results from the questionnaire. Therefore, the researcher used it to confirm integration of e-resources in the curriculum. The researcher accessed lesson notes, schemes of work, record of work, lesson plans, mark books and store ledgers in order to get information on integration of e-resources. Structural

observation was used to provide precise numerical results on integration of e-resources in teaching and learning of English language. OC attached as Appendix F.

3.6.3 Teacher's Interview Schedule (TIS)

Teacher's Interview Schedule (TIS) contained eleven items. It contained open ended questions. The researcher conducted face to face interview with 108 teachers. TIS used to collect data from teachers. It was effectively designed to assist in collection of data on integration of e-resources in teaching and learning of English language. The researcher met them to book an appointment with them. Guided by TIS the researcher interviewed all of them at different times and recorded their responses. TIS gave the researcher an opportunity to probe the respondents for clarification and elaborations on integration of e-resources in the curriculum. Therefore, interview allowed a researcher to investigate and prompt things that a researcher could not observe. It gave chance for detailed answers hence more explanative information was generated. Generally, it allowed researcher to clarify issues by asking again to counter – check. It supported and verified information from questionnaires. TIS attached as Appendix G.

3.7 Validity and Reliability of the Instruments

3.7.1 Face Validity

Validity referred to the degree to which results obtained from the analysis of the data represented the phenomenon under the study (Stephanie, 2016). In addition, Heale (2015),Kendra (2020) identified validity as the extent to which test measured what it purported to measure. Face validity of research instruments was established by considering the judgement of three experts in the department of Educational Communication, Technology and Curriculum Studies. Suggestions made by the experts were used to redraft the

instruments. This helped the researcher to check on the content, construction of items and criterion of research instruments. It gave accuracy and meaningfulness of inferences which were based on the research results (Kombo & Delno, 2006).In the study, triangulation of research methods was used to validate the research. Triangulation was the use of two or more methods of data collection. It demonstrated concurrent validity in qualitative and quantitative research (Cohen, Marion& Morrison,2000).

3.7.2 Reliability

Reliability referred to degree to which research instrument yielded consistent results or data after repeated trials (Stephanie, 2016). It also meant consistency with which the test measured (Robert & Norman, 2003). Reliability of instruments was established through pilot study on 10 principals, 20 teachers of English and 30 Form Two students in 10 public secondary schools. According to Hill (1998), Isaac and Michael (1995) suggested 10 to 30 participants for pilot study in survey research. The small scale preliminary study enabled the researcher to assess feasibility, duration, cost, adverse events and improved upon the descriptive survey design prior to performance of the full-scale research (Thabane *et al.*, 2010). The questionnaires were administered to respondents in pilot study on two independent occasions in a two weeks period under similar conditions. The study used test-retest (coefficient of stability) method to estimate degree of reliability of the instruments. To find the test – retest reliability coefficient, the researcher found out the correlation between the test and retest. The responses were compared using Pearson's Correlation Coefficient. SPSS was used to compute coefficients. In this case, the following formula of Pearson's Correlation Coefficient was used:

$$r_{xy} = \frac{N(\sum xy - \sum x \sum y)}{\sqrt{[N\sum x^2 - (\sum x)^2]\,[N\sum y^2 - (\sum y)^2]}}$$

Where:

r_{xy} = Coefficient of reliability

$\sum xy$ = Sum of the product x and y

$\sum x$ = Sum of the x rated values

$\sum y$ = Sum of the y rated values

$\sum x^2$ = Sum of the x values squared

$\sum y^2$ = Sum of the y values squared

N = Number of the pairs of scores

The computed coefficients of reliability were 0.85, 0.85 and 0.80 for questionnaires of principals, teachers of English and Form Two students respectively. The researcher adjusted instruments to reduce inconsistencies and ambiguities based on reaction of the respondents.

3.8 Data Collection Procedures

The researcher sought permission from Ethics Review Committee of Maseno University through School of Graduate Studies – Maseno University. The researcher obtained research authorization from National Commission for Science, Technology and Innovation (NACOSTI) before process of data collection. A copy of Research Permit attached as Appendix K. The researcher then informed Kakamega County Director of Education for period research was in progress. Once the permit was obtained, the researcher collected data from all the sampled schools. The permit enhanced smooth flow of research process in the field. Permission was sought from principals of selected schools through written letters three weeks before the study was undertaken. The researcher personally visited all sampled schools and administered questionnaires. During the visit, learners were sampled, and this was followed by administration of study instruments. Where necessary, clarification was made on items of the questionnaires. Secondary data of public secondary schools from Kakamega County Education Office was collected by researcher. Schemes of work, lesson plans and

store ledgers were analysed in Heads of Department Languages Office. This exercise was conducted in the month of February – March, 2020.

3.9 Data Analysis Procedures

The raw data collected through questionnaires was clarified and analysed through descriptive statistics that included frequencies, means and percentages based on objectives of the study. Statistical Package for Social Sciences(SPSS) computer based program was used as a tool for data analysis. Quantitative data collected from the closed – ended questionnaire items was analyzed by first coding and input coded responses into the computer for descriptive analysis. Open ended questions from questionnaire and interviews were transcribed and categorized based on the objectives of the study. Generally, the quantitative survey data was analysed using SPSS while thematic content analysis was used to analyse qualitative data. Findings of the study were presented using tables, frequencies and percentages in relation to objectives of the study.

3.10 Ethical Considerations

The researcher explained to the respondents the nature of the study and the reason why collecting the data. This included the importance of the study both to the respondent and the researcher. The respondents were also made aware that their participation in the study was purely voluntary and failure to take part would not attract any penalty whatsoever. The results of the findings remained confidential as individual responses were not known in any way since the respondents did not put down their names. The results of the study would be provided to the administration of the schools where the study was conducted so that the respondents could get a report of the study.

A copy of consent form was provided to respondents and the researcher took them through the contents of the form and they only signed for consent to participate once they felt that they were comfortable with the conditions provided (see APPENDIX A). A copy of information sheet containing all ethical considerations was also availed to each respondent taking part in the study by attaching it to the questionnaires for them to only proceed after agreeing with the issues presented (see APPENDIX A). For the cases of interview, the researcher read out the information on the sheet to the respondents and he only proceeded when the respondents were in agreement. In case of any queries or complaints that could arise later, the respondents were in a position to channel them to either the University or the researcher through the addresses given in the information sheet.

Data was collected using questionnaires provided and through interviews for teachers of English. The data remained anonymous and confidential as no identification detail was put on either the questionnaires or interview schedules except the detail in the consent form that was provided to the students. As such a coding only known to the researcher and the researcher assistant was made on the questionnaire that corresponded with the one on the consent form associated with it. The questionnaires were then kept separately from the consent forms in locked cabinet files whose keys were held either by the researcher or the research assistant and therefore no other person was able to gain access to the copies.The collected data was then coded into the computer and saved in the researcher's laptop, flash disk and in the researcher's e-mail account. In all these cases a password only known to the researcher and his assistant was created to protect the data.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The chapter presented findings and discussions that were undertaken with respect to objectives of the study and research questions raised in Chapter One. It was divided into five sections: Demographic data, availability of e-resources for use, perceptions of e-resources, teacher preparedness on use of e-resources and e-resource pedagogic methods.

4.2 Demographic Data

The study established demographic information of principals, teachers of English and Form Two students. The data was collected from 108 principals, 152 teachers of English and 370 Form Two students. The information was vital because it influenced integration of e-resources in teaching and learning of English language. Demographic information included: category of schools, teaching experience and professional qualification.

4.2.1 Category of Schools

The participants, in the study, came from different categories of public secondary schools namely national, extra - county, county and sub-county. The results for teachers of English sampled as per the category of public secondary schools were summed up in Table 2.

Table 2: Schools Categories and sampled Teachers of English

n=152 Teachers of English

School Category	**Number of schools selected (*n*)**	**Number of Teachers (f)**	**Percentages (%)**
National	1	8	5.3
Extra-County	22	33	21.7
County	28	43	28.3
Sub–County	57	68	44.7
Total	**108**	**152**	**100**

Table 2 indicated 5.3%, 21.7%, 28.3%and 44.7% teachers came from national, extra - county, county and sub – county public secondary schools in Kakamega County respectively. The categories produced accurate information on integration of e-resources in teaching and learning of English language. The response rate was 100%.

4. 2. 2 Teachers' Demographic Information

The data captured teaching experience, gender and professional qualification of teachers of English language. The findings summed up in Table 3.

Table 3: Demographic Information for Teachers

n= 152 Teachers of English

Demographic Information		**F**	**%**
Gender	Male	85	55.9
	Female	67	44.1
Teaching Experience (Years)	Below 2	18	11.8
	2 – 4	29	19.1
	5 – 6	38	25.0
	Above 6	67	44.1
Highest Professional Qualification	Bachelor of Education (Arts)	134	88.2
	Diploma in Education (Arts)	10	6.6
	Masters	8	5.2

Table 3 revealed that 29 teachers (19.1%) had taught English language for between two and four years; 38 (25%) teachers taught for between five and six years while 67 (44.1%) teachers had taught for six years and above. However, the research established that only 18 (11.8%) teachers had taught below two years after professional qualification. 134 (88.2%) teachers had teaching experience coupled with professional qualification. In the present study, a teacher who had taught for two years and above was considered as being experienced while one who had taught for less than two years considered as being inexperienced incorporating e-resources in teaching process. The above observations concurred with Russell, Babell, O'Dwyer and O'Connor (2003) study. They examined teacher technology use and

implications for pre-service and in-service teacher preparation. Further, the present research assumed that experienced teachers had rigorous principles and skills to the task of preparation and presentation of teaching materials. To sum up, Table 3 revealed that all sampled teachers had required qualification to teach English language in secondary schools.

4. 2. 3 Demographic Data of Learners

Demographic data of learners sampled for the study was as shown in Table 4.

Table 4: Demographic Data of Learners.

n= 370 Learners

Category of public secondary schools	Number of Students (f)	Percentage (%)
National	70	18.9
Extra – County	81	21.9
County	98	26.5
Sub – County	121	32.7
Total	**370**	**100.0**

Table 4 indicated 18.9%, 21.9%, 26.5% and 32.7% learners were sampled from national, extra – county, county and sub – county public secondary schools in Kakamega County respectively. Learners provided adequate information on use of e-resources in learning of English language. Learners' response rate was 100% in the current study.

4.3 Availability of E-resources for use.

Availability of e-resources in public secondary schools was of much interest to the study. Question item 6 of English Teacher's Questionnaire (ETQ) sought to find out from teachers number of e-resources available for teaching English language. The question was necessary because availability of e-resources enhanced integration in the curriculum. Teachers indicated whether e-resources were available or not available assumed up in Table 5.

Table 5: E-resources Available for Use

n=152 Teachers of English

Types of E-resources	Number of Teachers (f)	Percentage (%)
Discs recording	152	100.0
Video cassette recorders (VCRs)	42	27.6
Computer laboratories/ rooms	49	32.2
Radios	152	100.0
E-resource persons	61	40.1
Film strip slides	8	5.3
Over Head Projectors (OHPs)	67	44.1
Whiteboards	58	38.2
CD ROM Discs	77	50.7
Computers	152	100.0
Printers	152	100.0
E-readers	40	26.3
Televisions (TVs)	152	100.0
Mobile phones	83	54.6
Videos	8	5.3
Films	5	3.3
E-newspapers	152	100.0

From Table 5, results revealed that all 152 (100%)teachers indicated that their schools had discs recording, radios, computers, printers, TVs and e-newspapers. This was because the above mentioned e-resources were freely accessible and easily used in the curriculum.42(27.6%), 49 (32.2 %), 61 (40.1 %), 8 (5.3 %), 67 (44.1%), 58 (38.2%), 77 (50.7%), 40 (26.3%), 83(54.6%), 8 (5.3%) and 5 (3.3%) teachers showed availability of video cassette recorders (VCRs), computer laboratories/rooms, e-resource persons, film strip slides, OHPs, whiteboards, CD–ROM discs, e-readers, mobile phones, videos and films for teaching English language respectively.

The abovementioned results suggested that available e-resources were inadequate for frequent teaching and learning of English language. Therefore, they were scarcely utilized in schools. These results agreed with the study of Goko (2012).Goko's study focused on factors affecting use of ICT in teaching and learning in secondary schools in Kangema, Kenya. He used two schools for pilot study whereas the current research used 10 schools in Kakamega County, Kenya. According to the current results and that of Goko (2012) study, it was apparent that inadequate e-resources infrastructure hindered integration of e-resources in education. Further, teachers' underutilization of e-resources in the classroom was detrimental to integration approach in education. Thus, it was crucial to monitor teachers' e-resources utilization in schools.

In Table 5, VCRs (27.6%) were unsatisfactorily used in the curriculum. Respondents suggested that VCRs were generally unaccepted due to uneasiness of usability, affordability and accessibility. Therefore, they were not yet ready to use them. The aforesaid results were in line with the study of Khitam and Zuheir (2010). However, they explored students' readiness and attitudes towards e-learning paradigm. They developed an interactive web-based application prototype called Alaws Educational Network (AEN). The questionnaire targeted the secondary school students who attended a VCR session in AEN.

Teachers were faced with the problem of inadequate e-resources in schools. Contrarily, good leadership and friendly atmosphere enhanced implementation of e-resources in schools. School's assistance in terms of finance enabled successful integration of e-resources in teaching and learning process. The above mentioned results agreed with Shazia (2000) research. Shazia's study was literature review of factors affecting teachers' use of ICT in the curriculum. Therefore, schools management should provide enough funds for purchasing e-

materials, maintenance, in-service training and supporting of computing facilities (internet connectivity).Availability of computing facilities was a key pre-condition towards learning, adopting and benefiting from e-resources.

On the issue of inadequate e-resources, both the research of Muvango, Indoshi and Okwara (2019) and the results from Table 5blamed schools authorities' reluctance to purchase them. Significantly, in the present study teachers suggested the following ways to improve e-resources usage in schools: involvement of all stakeholders, improved orientation and provision of access - points of e-resources. The research of Muvango et al., (2019) focused on factors influencing use of media in teaching and learning of English in public secondary schools in Kakamega East Sub – County, Kenya. It used saturated sampling method to select sample size of 20 headteachers and 40 teachers. Moreover, it used simple random sampling method to select 500 Form Two students.

Additionally, Table 5conveyed that all schools had discs recording (100%). These results on discs recording were in tandem with Miima (2014) observation. She showed that all45 public secondary schools had discs recording. Both Miima's study and the current results associated 100% availability of discs recording with their inexpensive nature and convenience of use in education. The study of Miima (2014) focused on integration of ICTs in teaching and learning of Kiswahili language in public secondary schools in Kakamega County, Kenya. Miima's study used only two public secondary schools to estimate reliability whereas the current research established reliability using 10 schools. Therefore, the current pilot study suitably informed the researcher about the best research process and occasionally on likely outcomes (Teijlingen &Hundley, 2001). Interrogation was done to establish why teachers preferred discs recording in teaching and learning of English language, one of the teachers asserted that:

Discs recording are easy to use, cheap and found in bookshops easily. I give subject champion student to operate for others and leave them to watch the programs. Sometimes, I do not go to class, students watch, discuss and write down notes themselves.

Finally, Table 5 showed that mobile phones were fairly used in teaching and learning process. 54.6% teachers relied on google and Yahoo to access information through mobile phone handsets. The respondents suggested that mobile phones with wireless internet connectivity were insufficient due to unaffordable prices. Schools should intensify and embrace integration of mobile phones in the curriculum.

Question item 3 of Observation Checklist sought to find out location of e-resources for teaching and learning of English language. The findings were summarised in Table 6.

Table 6: Availability of E-resources Access – Points
n=108 Teachers of English

Locations		**Available in number of schools (f)**	**Percentage (%)**
Computer rooms	N	2	3.9
	E	21	41.2
	C	19	37.3
	S	09	17.6
		TOTAL 51	**100.0**
Administration Offices	N	1	3.6
	E	3	10.7
	C	11	39.3
	S	13	46.4
		TOTAL 28	**100.0**
HOD Languages Offices	N	1	5.3
	E	7	36.8
	C	5	26.3
	S	6	31.6
		TOTAL 19	**100.0**
Schools' e-resource centres	N	2	20
	E	7	70
	C	1	10
	S	00	00
		TOTAL 10	**100.0**

KEY
N – National School
E – Extra – County Schools
C – County Schools
S – Sub – County Schools

In Table 6, 51 (47.2%), 28 (25.9%), 19 (17.6%) and 10 (9.3%) teachers confirmed e-resources were kept in the computer-rooms, administration offices, HOD languages offices and schools' e-resource centres respectively. The national public secondary school selected had both computer rooms and e-resource centres. However, only one extra – county public secondary school did not indicate presence of computer room. The results revealed that national public secondary school observed had adequate access – points of e-resources.
Results from Table 6indicated inadequate computer rooms (47.2%) however; initially Table 5 established that all schools had computers. Therefore, it was expected that all schools to have computer rooms which was not the case. Insufficient computer rooms/laboratories played a great role in low usage of e-resources. Computer rooms and schools' e-resource centres were right access-points of e-resources including computers. They were points where students practised learning using digital content.

To sum up, disadvantages of administration offices and HOD languages offices as access - point of e-resources were that e-resources could not be freely accessed and used frequently by students. It was also tedious carrying them for classroom use. Schools should build more computer rooms/laboratories and e-resource centres to ease congestion so as to enhance adequate use of e-resources. Generally, lack of e-resources access-points was most common hindrance to integration in education.

The report of Anderson (1997) focused on information technology option for educational management in South East Asia and Pacific Region. He observed that ICT use was still constrained by irregular or unavailable electricity supply in the curriculum. The report involved only educational administrators and managers; it left out teachers and students. Therefore, Question item 5 of Observation Checklist sought to find out presence of electricity and generators in public secondary schools. Electricity was available in all schools in the

county however only 30 (27.8%) schools had generators. Rural electrification project had availed electricity in schools. Availability of electricity enabled teachers to use e-resources adequately. Moreover, 30 (27.8%) generators available, as back up, were limited in schools. In case of power outage, electricity could not be restored in most schools that lacked generators. At least, the current study indicated 30(27.8%) generators available. The research of Tella (2011)showed none of the colleges observed had a standby generator. It concentrated on availability and use of ICT in South Western Nigeria colleges of education.

The research of Plomp, Anderson, Law and Quale (2009) observed that accessibility of ICT resources was a necessary condition for integration of e-resources in education. This was a cross national study. It focused on ICT policies and practices in education. Thus, Question item 8 of ETQ sought to find out how teachers of English obtained e-resources for teaching and learning process. The findings were summed up in Table 7.

Table 7: E-resources for Teaching and Learning

n=152 Teachers of English

Mode of obtaining E-resources	Number of Teachers (f)	Percentage (%)
Students made them	46	30.3
Ministry supplied them	00	00.0
The school bought them	94	61.8
Teachers borrowed them	61	40.1
Teachers made them	73	48.0

Table 7 revealed that 94 (61.8%) teachers depended on school authorities to buy for them e-resources for teaching and learning of English language. 73 (48%) teachers indicated that they themselves made e-resources while 61 (40.1%) teachers borrowed from other institutions. 46 (30.3%) teachers suggested that students made e-resources for classroom use. Students learnt best when given the opportunity to be active participants in their learning.

Significantly, the research of Douglas and Candace (2018)concurred with aforementioned results. They did literature review on teaching and learning of Mathematics using discovery based method. Therefore, teachers should encourage learners to experiment, explore, inquire and discover during learning process. Consequently, learners applied ideas to their lives and created memorable lessons that would help them turn into lifelong learners.

Furthermore, findings from Table 7 disagreed with Muvango *et al.,* (2019) study. They recorded more teachers (70%) who made instructional media themselves than the current results which revealed 48% teachers made e-resources for teaching and learning process. The present results showed that teachers involved more learners in accessing various e-resources for classroom use. In addition, both the present research and their study showed majority of teachers depended on school authorities to provide for them teaching aids. As a result, they experienced difficulties to obtain e-resources for teaching process. Significantly, these results expressed that schools did not prioritize e-resource mobilization in the curriculum. The study of Muvango *et al*., (2019) determined factors influencing use of media in teaching and learning of English in public secondary schools in Kakamega East Sub-County, Kenya.

Lastly, Table 7depicted that the ministry concerned never supplied schools with e-resources. Ministry of Education (MoE) commitment to provide e-resources was not forthcoming in schools. This was contrary to social pillar of Vision 2030 which embraced use of e-resources in education. Through the social pillar of Vision 2030, MoE was obligated to provide quality education that prepared learners to competitively function within a highly integrated, technologically - oriented and information - based global economy (ROK,2018). Therefore, for Vision 2030 to be achieved, MoE should provide adequate e-materials to schools so as to have digitally literate workforce as foundation of knowledge – based economy. Alternatively, schools should work closely with stakeholders such as Parent Teachers Association (PTA),

donors, sponsors, NGOs and schools management for provision of enough e-resources in the curriculum. These results were in line with Nang'unda (2019) study. Nang'unda's study assessed principals' leadership in ICT integration in public secondary schools management in Bungoma County, Kenya. It employed descriptive survey and co-relational research designs.

Many schools had not figured out how to tap e-resources into teaching and learning process; instead students used them for their personal life and later dropped them in their school life. The research was based on educational technology and teacher preparation in the curriculum (Sessums, 2007). The Institute of Learning (IfL) (2010) reported also that few teachers were using e-resources in the most effective way. According to Sharma (2009) research integration of e-resources should be guided constantly to enhance their appropriate usage in the curriculum. The IfL (2010)study focused on brilliant teaching and training in further education and skills while Sharma's research determined use and impact of e-resources at Guru Gobind Singh Indraprastha University in India. Therefore, Question item 9 of Principal's Questionnaire (PQ) sought to find out how principals ensured teachers used e-resources appropriately in teaching of English language. Findings were summarized in Table8.

Table 8: E-resources Use in English Language

n=108 Principals

Appropriate use of E-resources	**Number of Principals (f)**	**Percentage (%)**
Head of subject supervised use of e-resources	32	29.6
Principals supervised it themselves	19	17.6
Encouraged team teaching and peer-learning in their schools	21	19.5
HOD Languages supervised use of e-resources	36	33.3
Total	**108**	**100**

Table 8 depicted that 32principals (29.6%) mandated head of subject (English) to supervise use of e-resources while 19 (17.6%) principals supervised use of e-resources themselves. 21principals (19.5%) encouraged team teaching and peer learning in their schools for effective integration of e-resources. The present study noted that team teaching and peer-learning activities supported with e-resources motivated teachers to teach effectively.36principals (33.3%) allowed HOD languages to supervise use of e-resources. Significantly, integration of e-resources should be monitored by all the stakeholders. However, HOD of languages was the chief quality assurance and standards officer of the department. HOD of languages selected, prepared and organised teaching and learning resources and emphasized their effective use in the curriculum. Therefore, it was right for principals to ensure that teachers used e-resources appropriately for effective learning process.

Question item 8 of PQ sought to find out from principals use of e-resources in schools. The findings were summed up in Table 9.

Table 9: Use of E-resources

n=108 Principals

E-resources	**Number of schools used (f)**	**Percentage (%)**
Internet search/use	20	18.5
Word processor	59	54.6
Computer games	7	6.5
Internet assignments	19	17.6
Simulation software	3	2.8
Total	**108**	**100.0**

From Table 9,59 (54.6%) principals indicated their teachers used word processors in teaching and learning of English language. The result implied that word processors were averagely used in schools. Therefore, both principals and teachers should intensify and embrace use of

word processors in education. The current results were in agreement with Magnesi (2011) study. Magnesi's research determined positive effects of computers in the classroom.

Moreover, in Table 9, 20 (18.5%), 7 (6.5%), 19 (17.6%) and 3 (2.8%) principals indicated that teachers use internet search, computer games, internet assignments and simulation software in teaching of English language respectively. They were inadequately used in schools. The study of Anyango (2017)agreed with the above mentioned results. Anyango's study used simple random sampling procedure to select geography teachers and geography students. It also used saturated sampling technique to select headteachers and Quality Assurance and Standards Officers (QASO) in secondary schools in Rachuonyo South Sub-County, Kenya.

Most schools were not connected to internet because of unaffordable fees charged by internet service providers consequently; there was limited integration of internet search/use (18.5%), internet assignments (17.6%), computer games (6.5%) and simulation software (2.8%). Generally, the results established that adequate provision of technical pre-condition (infrastructure) would promote regular use of e-resources in the curriculum. The research of Nomsa (2013) agreed with the aforementioned results. Nomsa's study determined challenges faced by schools when introducing ICT in developing countries.

Question item 4 of ETQ sought to find out from teachers use of CD-ROM story books, computer games, internet assignments, class internet search, software drills and practices and e-mail in teaching of English language. The findings were summed up in Table 10.

Table 10: Teacher E-resources use

n=152 Teachers of English

E-resources used	Responses(f)	Percentage (%)	Aggregate
CD-ROM story books	47	30.9	100
Computer games	33	21.7	50
Internet assignments	66	43.4	70
Class internet searches	59	38.8	72
Software drills and practices	25	16.4	60
E-mails use	72	47.4	80

From Table 10, 47 (30.9%), 33 (21.7%), 66(43.4%), 59(38.8%), 25 (16.4%) and 72 (47.4%) teachers used CD-ROM storybooks, computer games, internet assignments, class internet searches, software drills and practices and e-mail in teaching of English language respectively. The study of Machuki (2018) concurred with aforesaid results. Both Machuki's study and the results in Table 10 indicated inadequate internet connectivity in schools. Machuki's study targeted impact of ICT integration in teaching and learning in secondary schools in Kenyan Sub – County, Kenya. He used cross-sectional design whereas the current study used descriptive survey design.

Table 10 showed that internet assignments (43.4%) and class internet searches (38.8%) were deficiently used in the curriculum. Therefore, teachers should intensify their use because they provided references in teaching and learning process. Technological developments opened new horizons for information creation, storage, access and presentation. Significantly, the present study revealed that e-resources were inadequately used due to lack of infrastructure and unawareness of which resources existed. To sum up, the presence of insufficient e-resources in schools was a pointer that the environment was not yet conducive for integration in education.

Question item 3 of Learner's Questionnaire (LQ) sought to find out from learners on teacher use of e-resources in teaching of English language. Each statement had five possible answers: SA (Strongly Agreed), A (Agreed), U (Undecided), D (Disagreed) and SD (Strongly Disagreed). Findings were summed up in Table11.

Table 11: E-resources in English
n=370 Learners

Types of E-resources		**SA**	**A**	**U**	**D**	**SD**
		1	**2**	**3**	**4**	**5**
Class internet search	**F**	166	93	58	41	12
	%	44.9	25.1	15.7	11.1	3.2
Internet assignments	**F**	178	82	67	33	10
	%	48.1	22.2	18.1	8.9	2.7
Computer games	**F**	80	100	90	80	20
	%	21.6	27.0	24.3	21.6	5.4
Software drills and practices	**F**	75	94	99	49	53
	%	20.3	25.4	26.8	13.2	14.3
Word Processors	**F**	251	79	34	6	0
	%	67.8	21.4	9.2	1.6	0
CD-ROMs	**F**	109	111	90	54	6
	%	29.5	30.0	24.3	14.6	1.6
E-mails use	**F**	151	100	80	35	4
	%	40.8	27.0	21.6	9.5	1.1

Table 11indicated that learners strongly agreed and agreed that teachers used class internet search (70%), internet assignments (70.3%), word processors (89.2%), CD–ROMs(59.5%) and e-mails(67.8%) in teaching of English language. The findings showed that teachers allowed learners to access and use internet which provided quality information that enhanced knowledge in the curriculum. Contrarily, the initial results established that class internet search, internet assignments, computer games, software drills and practices, CD-ROMs and e-mail were inadequately used but learners still appreciated using them for learning process. Hence, schools authorities and MoE should provide adequate e-resources to support learning in schools.

Question item 17 of ETQ sought to find out ways teachers accessed content of e-resources. The findings were summarized in Table 12.

Table 12: E-resources in Teaching Process

n=152 Teachers of English

E-Content Access	Number of Teachers (f)	Percentage (%)
On computer screen	144	94.7
On phone screen	83	54.6
Download content in storage devices	150	98.7
Print out from e-resources	127	83.6

Table 12 indicated ways teachers accessed content of e-resources for teaching of English language. 144 (94.7%), 83 (54.6%), 150 (98.7%)and 127 (83.6%) teachers accessed content from computer screens, phone screens, download in storage devices and print out from e-resources respectively. The results revealed that teachers were aware of various ways of accessing content from e-tools during learning. However, content from phone screens was averagely used by teachers. It was an indicator that mobile phones were not integrated sufficiently in the curriculum. Importantly, cell phones were critical distribution platform for internet, video and audio application. Also, cell phones connected to a wireless network were web surfer, word processor, dictionary and gateway to the world's knowledge base.

According to Ricciuti (2015) research e-mail was used for communication, reference and storage. Also, there were many software platforms available to send and receive e-mails (Johnson *et al*., 2012) popular ones included: Gmail, Hotmail, Webmail, Yahoo, Outlook, and many others. The study determined issues for e-resources collection development in Netherlands. Therefore, Question item 11 of ETQ sought to find out how many times teachers used e-mail for teaching and learning of English language. Teachers were expected

to rate usage of emails in terms of daily, weekly, monthly, fortnightly and never at all. The findings were summed up in Table 13.**Table 13: Use of E-mail**

n=152 Teachers of English

Time duration	**Number of Teachers used E-mail (f)**	**Percentage (%)**
Daily	2	1.3
Weekly	33	21.7
Monthly	71	46.7
Fortnight	46	30.3
Never at all	00	0.0
Total	**152**	**100.0**

In Table 13, 2 (1.3%), 33 (21.7%), 71 (46.7%) and 46 (30.3%) teachers used emails daily, weekly, monthly and fortnightly in teaching of English language respectively. Thus, email was inadequately used in the curriculum. The results 23%teachers daily (1.3%) weekly (21.7%)also certified that email was unsatisfactorily integrated in teaching and learning process. It was suggested that teachers sent learning material to students via e-mail. They also gave assignments, assessed and sent feedback to the students'/parents' e-mail boxes. The study of Lefuma (2017) concurred with the above results. Lefuma's research targeted access to and use of electronic information resources in academic libraries of the Lesotho Library Consortium.

E-resources required ICT infrastructure which included steady and reliable internet connectivity. The observation of Teachers Service Commission (TSC) (2021) showed that several schools were connected to the internet through various initiatives such as iMlango, Constituency Development Fund, county governments, the United Nations Children's Fund (UNICEF) and Communications Authority through the Universal Access Fund. This was TSC manual on Remote Learning Methodologies (RLM) for teachers. Thus, Question item 6 of Observation Checklist sought to find out how teachers accessed Internet connection in teaching and learning of English language. Findings summarised in Table 14.

Table 14: Availability of Internet Connection

n=108 Teachers of English

Internet connection	**Number of Teachers of English(f)**	**Percentage (%)**
Local Area Network (LAN)	00	0.0
Satellite	11	10.2
Modem	108	100.0
Wireless internet connection	12	11.1
Cable	10	9.3

From Table 14, 11 (10.2%), 12 (11.1%) and 10 (9.3%)teachers used satellite, wireless internet connection and cable to access internet respectively. They were inadequately used in schools. This was because most schools were not yet connected to internet due to high fees charged by internet service providers such as Safaricom. Internet connectivity was identified as the main challenge of accessing e-resources. However, 100%teachers used modems to access internet. This was because of their convenience of use and inexpensive nature. Omariba (2016) study concurred with the results in Table 14. She targeted tutors, second year student teacher trainees, colleges' principals and KICD e-learning officers in central region of Kenya. In the research of Chepukaka (2017) however; respondents accessed resources from office computers through the Kenya Agricultural and Livestock Research Organization (KALRO) Local Area Network. This study disagreed with both results in Table 14 and Omariba (2016) research. Chepukaka's study involved research assistants, information workers, ICT personnel and technical staff.

Furthermore, the study of Lefuma (2017) evaluated access to and use of electronic information resources in the academic libraries of the LELICO. She established that 29 (74.4%) and 16 (41%) were available computer LAN or internet cafe facility and Hotspots or Wi-Fi respectively. To the contrary, the current results in Table 14 revealed that wireless

internet connection, satellite and LAN were insufficiently used in schools. Schools used Wi-Fi to connect buildings, auditoriums and outside areas (Jackson, 2014). Wi-Fi facility allowed computers, smartphones, tablets computers, personal computers (PCs)or other devices to connect to the internet or communicate with one another wirelessly within a particular area. Wi-Fi service enhanced access to and use of e-resources thus supporting learning and teaching process. It was advantageous because could be used anywhere, anytime, without students visiting the LANs. LANs sometimes were fully occupied. Teachers could monitor learner's performance from a remote station on a Local Area Network (LAN) and provide assistance accordingly.

Though, there were notable initiatives to improve internet connectivity in Kenya, Gathoni *et al.,* (2011) survey emphasized that connectivity remained the major challenge. Therefore, results from Table 14 called concerted effort from all stakeholders and policy makers to work towards improving internet connectivity in schools. The study of Gathoni *et al.,* (2011)agreed with the results in Table 14. They monitored and evaluated electronic resources in academic and research institutions in Kenya. They selected seven Kenya Libraries and Information Services Consortium (KLISC) for their study. To conclude, the findings pointed out that teachers 'access of internet was insufficient in teaching and learning of English language.

Electronic information resources were corrupted as intended or unintended consequences of a computer virus infection. Often, violations of system security were undetected until the damaged content or other evidence of the violation was discovered. As a result, back-ups were essential since data could easily be deleted or corrupted with the push of a button (Ngulube, 2006). Ngulube's study focused on nature and accessibility of public archives in the custody of selected national archival institutions in Africa. Thus, Question item 7 of TIS

sought to find out from teachers how they stored their work in teaching and learning of English language. Findings were summarised in Table 15.

Table 15: Available E-tools for Content Storage

n= 108 Teachers of English

Type of Storage	Number of Teachers (f)	Percentage (%)
Cloud computing	92	85.2
Phone memory	81	75.0
Flash discs	108	100.0
CD discs	108	100.0

From Table 15, 108 (100%) teachers stored their work in flash discs and CD discs. The results indicated that flash discs and CD discs were always available, easily prepared and readily used in teaching and learning process. Consequently, both CD and flash discs required little expertise for use in the curriculum. It was also revealed that videos or photos were stored in flash discs and CD discs thereafter displayed on laptop/computer for instruction use. Finally, 85.2% and 75% teachers used cloud computing and phone memory to store their work respectively. Teachers were right to indicate how they stored their work because in case of content loss; it could be retrieved from back up easily. Generally, cloud computing, phone memory, flash disc and CD disc solved storage problems in education. Alternatively, documents, programmes and other files were stored on hard drive. Also, a portable USSD drive was used to add storage or back up. Schools management should check for computer memory and hard drive when purchasing computers. Significantly, interrogation was done to establish why flash discs and CD discs were preferred for storage in teaching and learning of English language, one of the teachers asserted that:

> *CD discs and flash discs are readily available, cheap and portable. They are easy to use for storage and display purposes. However, flash discs can accommodate many documents, work and editing is done easily unlike CD discs.*

4.4 Perceptions of E-resources

The study of Jamalahdin *et al.,* (2017) indicated that e-resources increased participatory learning and communication in education. Jamalahdin's study determined the role of ICT in learning – teaching process. For this reason, Question item 10 of PQ sought to find out from principals ways in which e-resources influenced student's learning of English language. Findings were summarised in Table 16.

Table 16: Influence of E-resources

n= 108 Principals

Influence of E-resources	**F**	**(%)**
Increased retention in learning	56	51.9
Helped in teaching and learning	53	49.1
Ensured understanding of concepts	73	67.6
Made learning lively	68	63.0

From Table 16, 56 (51.9%), 53 (49.1%), 73 (67.6%) and 68 (63%) principals suggested that e-resources increased retention rate, helped in teaching and learning, ensured understanding of concepts and made learning lively respectively. The principals showed that e-resources influenced student's learning of English language. They enhanced learners' interaction and engagement during learning process. Interactive learning was a stimulus for productive learning outcomes such as effective teaching and learning through e-resources. They influenced student's learning as a result of access to quality information. Thereupon, e-resources helped learners to acquire knowledge, skills and attitudes to solve situations in learning process. The results in Table 16 agreed with Okello-Obura and Magara (2008) study. They focused on electronic information access and utilization at Makerere University in Uganda. It used a quantitative approach in which a structured survey questionnaire was used

for data collection unlike the current study employed both quantitative and qualitative research approaches.

Question item 4 of LQ sought to find out students' opinion on use of e-resources in learning of English language. Each statement had five possible answers: SA (Strongly Agreed), A (Agreed), U (Undecided), D (Disagreed) and SD (Strongly Disagreed). Findings summarised in Table 17.

Table 17: Learner's Opinion on Influence of E-resources

n= 370 Learners

Statements		**SA**	**A**	**U**	**D**	**SD**
		1	**2**	**3**	**4**	**5**
Enhanced learning	**F**	112	245	13	0	0
	%	30.3	66.2	3.5	0	0
Increased desire to learn	**F**	166	204	0	0	0
	%	44.9	55.1	0	0	0
Concepts were well understood	**F**	209	160	1	0	0
	%	56.5	43.2	0.3	0	0
Ensured long retention	**F**	193	177	0	0	0
	%	52.2	47.8	0	0	0
Concepts became lively during learning	**F**	204	166	0	0	0
	%	55.1	44.9	0	0	0

In Table 17learners strongly agreed and agreed that e-resources enhanced learning (96.5%), made concepts well understood (99.7%), whereas100%learners strongly agreed and agreed that e-resources ensured long retention in learning, increased desire to learn and made concepts become lively during learning process. The results revealed that students were aware of benefits accrued from integration of e-resources in education. Learners proposed that e-resources increased level of learning process. They supported teaching and learning activities such as class internet search and internet assignments.

Question item 9 of ETQ sought to find out from teachers their opinions on TV use in teaching and learning of English language. Each statement had five possible answers: SA (Strongly Agreed), A (Agreed), U (Undecided), D (Disagreed) and SD (Strongly Disagreed). The findings summed up in Table 18.

Table 18: Teacher's Opinion on Television

n= 152 Teachers of English

Statements		**SA**	**A**	**U**	**D**	**SD**
		1	**2**	**3**	**4**	**5**
Provided help in teaching	**F**	103	47	2	0	0
	%	67.8	30.9	1.3	0	0
Provided richer experience	**F**	32	100	20	0	0
	%	21.0	65.8	13.2	0	0
Expanded curriculum	**F**	30	98	15	9	0
	%	19.7	64.5	9.9	5.9	0
Limited curriculum	**F**	0	0	10	90	52
	%	0	0	6.6	59.2	34.2
Had no effect on curriculum	**F**	0	0	2	60	90
	%	0	0	1.3	39.5	59.2
Improved curriculum	**F**	34	98	20	0	0
	%	22.4	64.5	13.1	0	0
Improved quality of overall programs	**F**	24	116	10	2	0
	%	15.8	76.3	6.6	1.3	0

From Table 18, teachers strongly agreed and agreed that TVs helped in teaching (98.7%), provided richer experience (86.8%), expanded curriculum (84.2%), improved curriculum (86.9%)and improved quality of overall programs(92.1%) in education. The results advocated that teachers were aware of merits of incorporating TVs in teaching and learning process. It was an effective teaching tool that built literacy and overall critical thinking skills amongst learners, addressed current social issues and energized classroom dynamics. The respondents also suggested that TVs promoted sound recognition during teaching process. Therefore, it was clear that high quality TV content viewed in moderation actually helped students to

learn. The above observations were in line with Durham (2016) study. Durham's study targeted benefits of using TV in the classroom.

Furthermore, Question item 5 of LQ, sought to find out from learners about their attitudes towards television use in learning of English language. Each statement had five possible answers: SA (Strongly Agreed), A (Agreed), U (Undecided), D (Disagreed) and SD (Strongly Disagreed). Findings summarised in Table 19.

Table 19: Learner's View of Television
n= 370 Learners

Learners' Opinions on Television use		**SA**	**A**	**U**	**D**	**SD**
		1	**2**	**3**	**4**	**5**
Television teacher was better prepared, organized and covered content better.	**F**	178	41	151	0	0
	%	48.1	11.1	40.8	0	0
Otherwise an available opportunity for education.	**F**	174	50	146	0	0
	%	47.0	13.5	39.5	0	0
No interruptions.	**F**	176	194	0	0	0
	%	47.6	52.4	0	0	0
Could not ask question.	**F**	201	99	68	2	0
	%	54.3	26.8	18.4	0.5	0
Lacked personal contact with teacher.	**F**	302	20	48	0	0
	%	81.6	5.4	13.0	0	0
TV boring, monotonous, difficult to pay attention.	**F**	0	0	0	173	197
	%	0	0	0	46.8	53.2
The TV teacher was too fast and if one got lost s/he could not catch up.	**F**	0	0	26	146	198
	%	0	0	7.0	39.5	53.5

Table 19 stipulated that learners strongly agreed and agreed that television teacher was better prepared, organized and covered course better (59.2%), provided otherwise an available opportunity for education (60.5%) and there were no interruptions (100%) during TV program. The results conveyed that learners appreciated integration of TV in learning of English language. Visual component of TVs improved learning process. Listening to good users of language on TVs enhanced student's language skills such as speaking, listening, reading and writing. Students generally had positive attitudes towards TVs use in learning

process. On that account, it was an indicator that TVs were the best learning aid. The findings in Table 19 were consistent with those of Tiene and Whitmore (1995) study. Though e-resources covered a wide range of devices, their study specifically focused on TVs use as a tool for teaching and learning process. In accordance with Muvango et al., (2020) study TVs simplified language of authors during learning session. They also allowed teachers to reach students more easily. The study of Muvango *et al.,* (2020) established perceptions of teachers on media use in teaching and learning of English language.

Furthermore, Table 19 recorded that learners strongly agreed and agreed that they could not ask questions (81.1%)and lacked personal contact with the teacher (87%). The results signified that classroom teachers did not facilitate learning process appropriately during TV programme. The teacher must be continually in the conversation with learners during TV program, creating learning experience that was open to new directions depending upon the needs of the student as learning progresses. For instance, during TV programme the classroom teacher should instruct learners to attend to the TV screen, ask assisting questions, provide feedback and manage the next learner. These observations agreed with the research of Eke (1997). The study of Eke based on supporting media learning in primary classrooms. It was a case study.

The results in Table 19 also indicated100% of learners strongly disagreed and disagreed that TV was boring, monotonous and difficult to pay attention. They disagreed because watching and understanding television program required development of attention, media decoding and narrative comprehension skills. These results were in line with Anderson, Lavigne and Hanson (2013) study. They targeted impact of television in education. Furthermore, educational TV helped students to learn how to read and promote letter identification. Generally, TV programs made teaching and learning process interactive and collaborative

instead of the traditional teacher-talking and students listening approach. These results were in tandem with Tempesta (2016) research. The research focused on benefits of using television in the classroom.

Finally, Table 19revealed that92.7% learners strongly disagreed and disagreed that TV teacher was too fast and if one got lost s/he could not catch up. This was because in case TV teacher was fast, video cassette recorder (VCR) was used to view TV programs where a student could not catch up during TV lessons or aired at times other than class time. The above observation concurred with Jain (2021) research. Jain's study determined use of VCR in classroom.

The use of e-resources ensured that all learners were involved in teaching and learning activities. Therefore, Question item 6 of LQ expected learners to indicate e-resources influence on learning of English language in terms of strongly agreed, agreed, undecided, disagreed and strongly disagreed. The findings summed up in Table 20.

Table20: Learner's Perception on E-resources

n=370 Learners

Statements	**Number of Learners (f)**	**Percentage (%)**
Strongly agreed	63	17.0
Agreed	172	46.5
Undecided	120	32.4
Strongly disagreed	7	1.9
Disagreed	8	2.2
Total	**370**	**100**

In Table 20, 63 (17%), 172 (46.5%), 120 (32.4%), 7 (1.9%) and 8 (2.2%)learners strongly agreed, agreed, undecided, strongly disagreed and disagreed that e-resources influenced

learning of English language respectively. 63.5% learners strongly agreed (17%) agreed (46.5%) that e-resources influenced learning process. These results therefore advanced that learners appreciated use of e-resources in the curriculum. They improved academic self-confidence, student-teacher connectedness and academic self-reliance in education. These results agreed with those of Saeed, Ejaz and Rupert (2017) study however; they collected data via semi-structured questionnaires distributed to undergraduate students from three countries: United Kingdom, Saudi Arabia and Kenya. Hence, it was a comparison study. They determined influence of online resources on student – lecturer relationship in higher education.

Question item 12 of ETQ sought out from teachers how much they used e-resources in content areas in teaching and learning of English language. The findings summarised in Table 21.

Table 21: Teacher's Opinion on E-resources in Content Areas

n=152 Teachers of English

Content Areas		**Very Often**	**Often**	**Fairly Often**	**Rarely Often**	**Never at all**
Speaking and listening	**F**	90	15	21	14	12
	%	59.2	9.9	13.8	9.2	7.9
Reading and writing	**F**	83	23	27	13	6
	%	54.6	15.1	17.8	8.6	3.9
Reading and listening	**F**	77	29	13	30	3
	%	50.7	19.0	8.6	19.7	2.0
Writing and grammar use	**F**	57	63	24	5	3
	%	37.5	41.4	15.8	3.3	2.0

Table 21depicted that most teachers used e-resources in teaching integrated English language skills. This implied that integration of language skills and e-resources improved student's knowledge, skills and attitudes towards e-material sin the curriculum. They created interest

and made the task of teaching easy. Simultaneous use of multiple forms of e-resources in classroom had unlimited potential benefits for learners and teachers. The aforementioned results were consistent with the study of Hadi and Zeinab (2012). They focused on challenges for using ICT in education and it involved teachers only.

Moreover, Question item 7 of ETQ sought from teachers of English available e-resources for teaching integrated language skills. The results showed that teachers handled comfortably integrated approach in education. The results were in tandem with Mwangi, Kisirikoi, Gichema and Mukunga (2018) observation that when e-resources and language skills were integrated dexterously, made learning process enjoyable and enriched student's learning process. Additionally, the results established that: radio, CD-ROM, mobile phone, video, film and OHP were used for teaching listening skills and speaking skills while CD-ROMs, e-reader, computer, laptop and OHP were used for teaching writing skills, reading skills and grammar use. E-readers and e-newspapers were used for teaching reading skills, listening skills and grammar use. To sum up, the choice of e-resources should be based on the content to be taught and objectives to be achieved in the curriculum.

Word processor enhanced acquisition of language skills amongst learners. It improved writing process because of its superior editing tools such as thesaurus, autocorrect spelling and grammar checkers. Hence, it provided students with opportunities to connect listening skills, reading skills, writing skills and grammar use. To the contrary, the aforementioned results contradicted Miima (2014) study which revealed that 60%Kiswahili language teachers were uncomfortable teaching grammar and listening skills using ICTs. This was an indicator that inappropriate use of e-resources directly influenced negatively communication, collaboration and critical thinking during teaching and learning process. Both Miima (2014) and Manduku (2012) studies alleged that most schools used e-resources inappropriately.

Therefore, curriculum implementers must emphasize appropriate use of e-resources so as to improve learning outcomes. They must also enforce strictly National ICT training policy amongst teachers and even to other users of the school library. This would improve learners and teachers attitudes towards e-materials in the curriculum. Manduku's research concentrated on integrating ICT in curriculum delivery for digital content; lessons from the Kilgoris Kindle Schools Project in Kenya whereas Miima (2014)focused on integration of ICTs in teaching and learning of Kiswahili language in secondary schools in Kakamega County, Kenya.

4.5 Teacher Preparedness on use of E-resources

The section highlighted teachers' highest professional qualification, teaching experience, pre-service and in-service training courses on use of e-resources in teaching and learning of English language.

4.5.1 Highest Professional Qualification

Education level was vital in determination of teachers' competence in the area of integration of e-resources in teaching and learning of English language. The Session Paper No. 1 of 2005 identified education as an avenue for equipping the country with e-resources skills (MOEST, 2005). The National ICT Policy ensured that all teachers/trainers possessed requisite e-resources skills (ROK, 2018).Consequently, Question item 1 of ETQ sought to find out highest level of professional qualification of teachers of English language. The analysis of data showed that 152 (100%) teachers who participated in the study were professionally trained as shown in Figure 1.

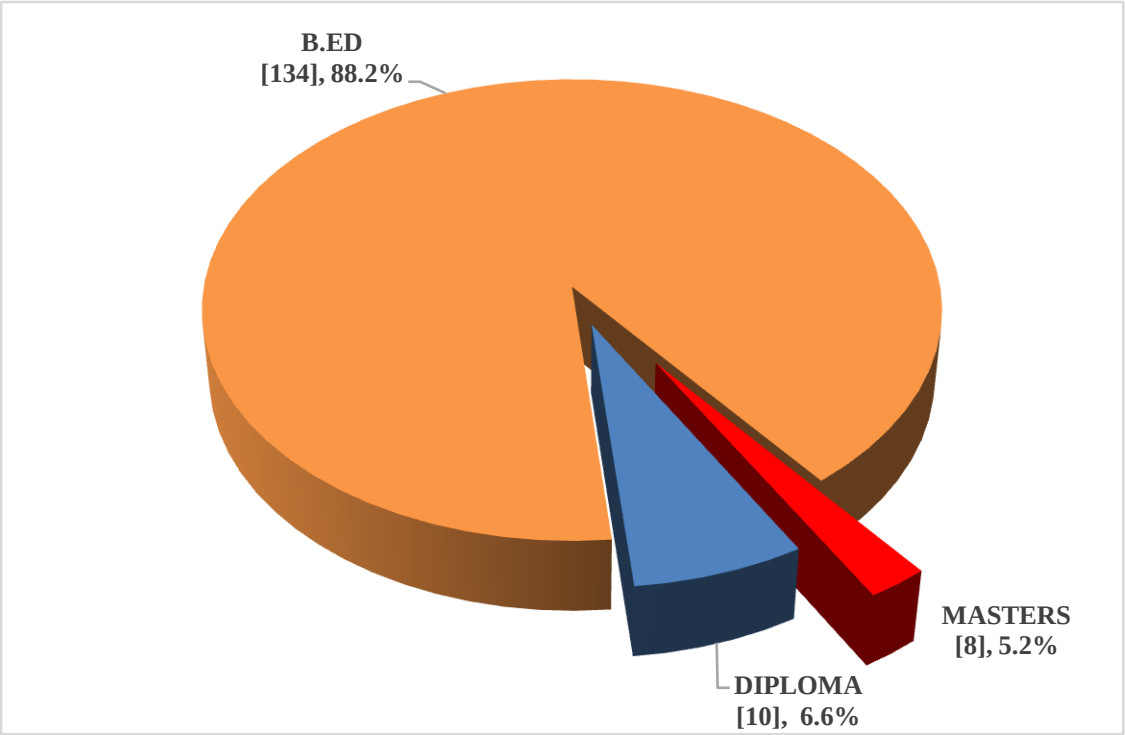

Figure 1: Highest Academic Qualification

In Figure1, 134 (88.2%) teachers were holders of Bachelor's Degree in Education (B.Ed Arts), 10 (6.6%) teachers held Diploma in Education while eight teachers(5.2%) held Masters Degrees. The findings revealed that they underwent pre-service training course which prepared them on integration of e-resources in teaching and learning of English language. Thus, the study assumed that they were aware of use of e-resources in education. Moreover, Figure 1 displayed that all teachers had required qualification to teach English language. The study of Schiller (2003) concurred with the aforementioned results. Schiller's research focused on perceptions of Australian principals on ICT use. It involved only principals who provided views on working with ICT. He left out vital education stakeholders such as teachers who were close to learners thus were the best people to provide views on ICT integration in the curriculum.

It was expected that qualification of teachers would correlate positively with integration of e-resources in education. This was not the case; initial results showed inadequate integration of

e-resources in the curriculum. One of the aims of 21st Century in education was for teachers to develop appropriate digital skills. Therefore, the study expected professionally trained teachers to have acquired e-resources skills either through pre-service or in-service training courses.

4.5.2 Pre-service Training Course

Question item 5 of ETQ sought to find out degree of adequacy that university/college training course prepared teachers for use of e-resources in teaching and learning of English language. Figure 2showed summary of their responses.

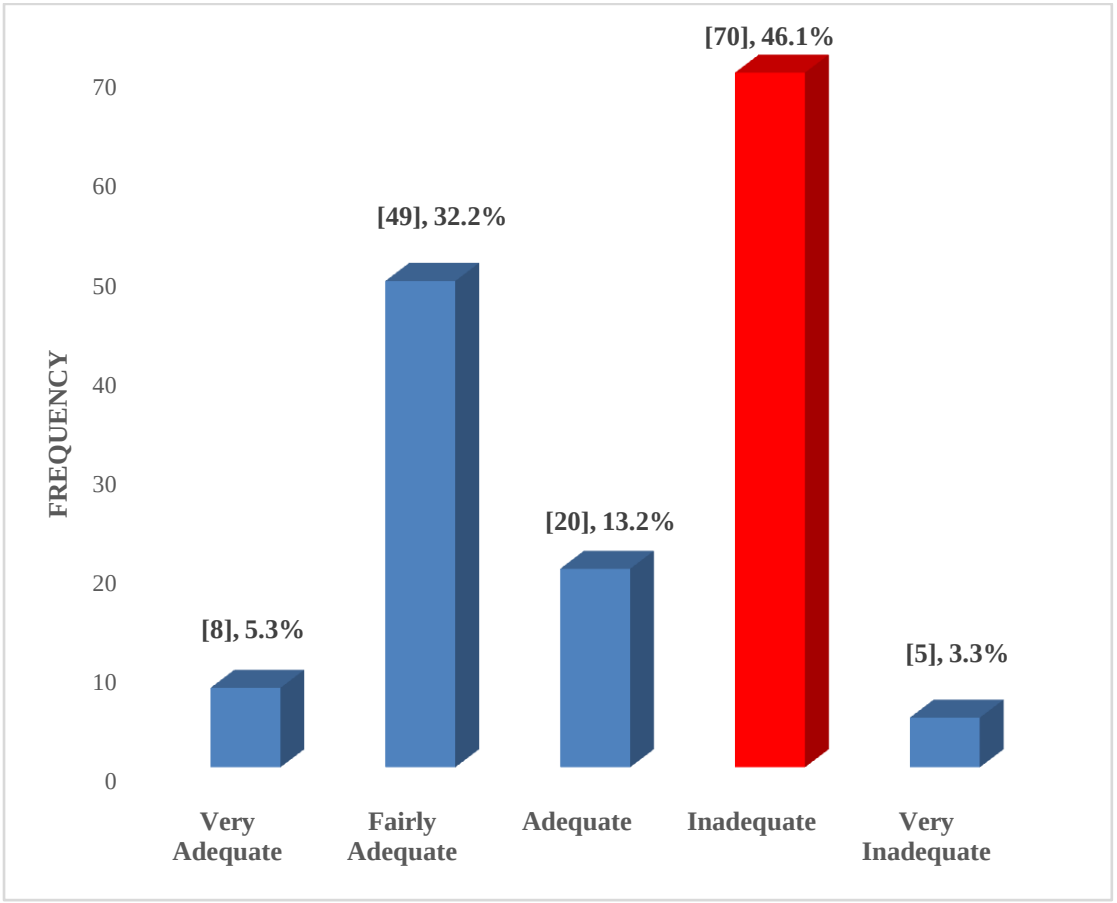

Figure 2: Pre-service Training Course

From the analysis above, 8 (5.3%) teachers viewed pre-service training course prepared them very adequately while 20 teachers (13.2%) viewed that it prepared them adequately on integration of e-resources in teaching and learning of English language. Fairly adequate 49

(32.2%) inadequately 70 (46.1%) teachers were B. Ed graduates and very inadequate 5 (3.3%) teachers were Diploma in Education graduates. The results indicated that pre-service training course gave little focus on integration of e-resources in education. Thus, teachers were required to continue attending in-service training courses in order to acquire knowledge, skills and attitudes regarding integration of e-resources in the curriculum.

The study of Muvango *et al.,* (2019) contradicted the aforesaid results. It showed that 80% teachers held the view that pre-service training course on instructional media prepared them adequately for teaching of English language. They determined use of media in teaching and learning of English in 20 public secondary schools in Kakamega East Sub-County, Kenya. They used questionnaire, document analysis guide, interview schedule and lesson observation schedule to collect data. Significantly, their research and the results in Figure 2 showed gaps left by pre-service training course on integration of e-resources in education. However, the gap left by pre-service training course in the present study was higher (49.3%) than the gap left in Muvango *et al.,* (2019) research (20%).This was caused by large sample size of 108 public secondary schools selected in the current study which provided accurate percentages and small margin error (Zamboni, 2018, Patel, Doku, & Tennakoon, 2003).

4.5.3 Teachers who attended In-service Training Course

The results from Figure 2 established that 49.4%inadequately (46.1%) very inadequately (3.3%) teachers held the view that pre-service training course did not prepare them well on incorporation of e-resources in teaching of English language. The results revealed that pre-service training programs currently in place were insufficient. The above results concurred with Gathoni *et al.,* (2011) research. They monitored and evaluated electronic resources in academic and research institutions in Kenya. On that account, it was right for Question item 3 of ETQ to find out from teachers, in-service training course attended on use of e-resources in

teaching of English language. Teachers indicated in-service training courses attended because (Indoshi, 1999) teaching profession required them to attend capacity building courses frequently. Indoshi's study assessed in-service education and training needs of primary schools Agriculture teachers in Kenya. The summary of their responses summarized in Figure 3.

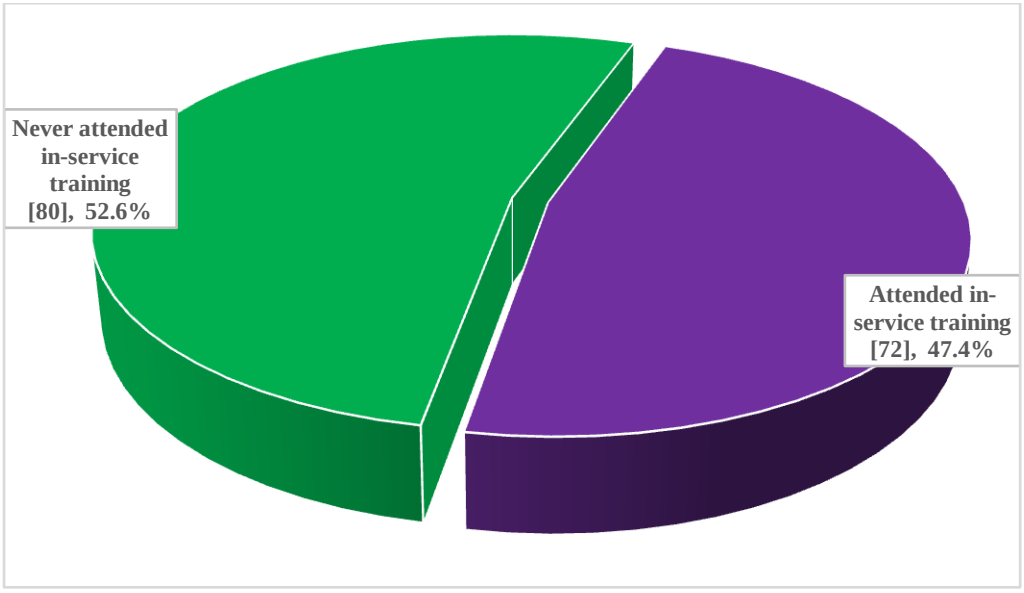

Figure 3:In-service Training Course

Figure 3 revealed that only 72(47.4%) teachers attended in-service training courses and were satisfied with the training received on integration of e-resources in teaching and learning of English language. 80 (52.6%) teachers never attended an in-service training course on use of e-resources since their professional certification. The reasons advanced by 80 (52.6%) teachers were that in-service training courses on integration of e-resources were rarely conducted, costly, inconsistent and never given invitation letters for such training course. Thus, the above mentioned reasons hindered them from attending in-service training courses on integration of e-resources in education. 52.6% of teachers preferred quality and affordable professional training programmes on integration of e-resources so as to gain knowledge, skills and attitudes to transform teaching practices. The respondents also suggested scheduled

and regular in-service training courses on incorporation of e-materials in education. This would fill gaps left by pre-service training and support innovations in the curriculum.

The study of Ouma et al., (2019) concurred with the above results. Both Ouma et al., (2019) study and the results in Figure 3 depicted that few teachers frequently attend workshops/conferences on integration of e-resources in the curriculum. Besides, majority of teachers do not apply effective e-resources integration strategies in teaching and learning process despite the fact that they had attended professional training programs. The study of Ouma et al., (2019) used cross sectional survey research design. They focused on teacher's computer capacity in public primary schools in Homa Bay County, Kenya.

Furthermore, respondents suggested a similar frequent in-service training course be provided to library users. This would create awareness of availability, accessibility and appropriate use of e-resources in the curriculum. The results from Figure 3 established that in-service training courses attended by teachers on integration of e-resources were sponsored or organized by KICD and MoE. The above results concurred with Bhukuvhani *et al.,* (2012) study. To the contrary, the research of Bhukuvhani *et al.,* (2012) determined effects of electronic information resources skills training for lecturers on pedagogical practices and research productivity in Zimbabwe. They used 30 lecturers (from three faculties namely science education, commerce and agriculture and environmental science) who attended Electronic Information Resources Skills Training (EIRST) workshop. Therefore, it was obvious that their research did not involve undergraduates and university administrators.

4.5.4 Teachers Preparation on Use of E-resources

Question item 2 of ETQ sought to find out from teachers how long they had taught English language in public secondary schools since professional certification. This was on assumption that teachers with shorter duration of service had less historical knowledge on integration of e-resources in teaching process. Those with longer duration of service had more understanding on use of e-resources in the curriculum. The research established that there were only 18 (11.8%) teachers who had taught below two years after professional qualification. The results indicated 29 (19.1%) teachers had taught for between two and four years; 38 (25%) teachers taught for between five and six years while 67 (44.1%) teachers had taught for six years and above. The findings were summed up in Figure 4.

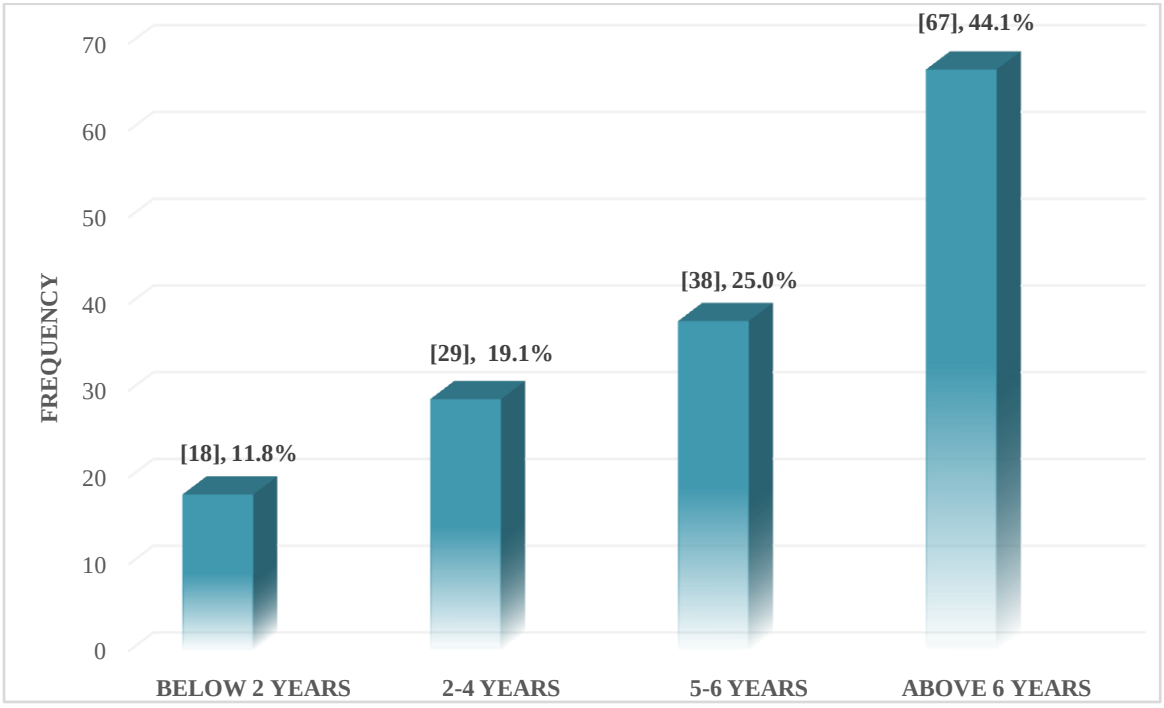

Figure 4: Teaching Experience of Teachers

Figure 4showedthat134 (88.14%) teachers had teaching experience coupled with their professional qualifications. Thus, they were expected to be knowledgeable about integration of e-resources in teaching process; which was not the case. The initial results revealed that there was insufficient incorporation of e-materials in the curriculum. Contrarily, both

Omariba (2016) and Gorder (2008) studies established that teachers who had long experience in teaching were positively influenced in the use of ICTs in their instructional process. Gorder researched on teacher preparation of instructional technology integration in the classroom whereas Omariba's study targeted teacher's preparedness in integrating ICT in training teachers in four public primary teacher training colleges in central region of Kenya. The research of Niederhauser and Stoddart (2001) and the results in Figure 4 proved otherwise that teaching experience did not correlate with integration of e-resources in the curriculum. This indicated that teachers' familiarity with e-resources did not mean that they integrated them frequently in education. Consequently, future studies should endeavour to find out whether or not teaching experience correlates with integration of e-resources in teaching and learning process. Niederhauser and Stoddart determined teachers' instructional perspectives and use of educational software in the curriculum.

4.5.5 Preparedness on E-resources Use

Question item 12 of PQ sought to find out from principals challenges of using e-resources in teaching and learning of English language. Findings were summarised in Table 22.

Table 22: Teacher's Preparedness on E-resources Use

n= 108 Principals

Challenges of E-resources	f	%
Insufficient e-resources	64	59.3
Lacked computer rooms/laboratories/infrastructure	44	40.7
Insufficient funding for e-resources use	66	61.1
Insecurity	44	40.7
Unaffordable internet connection	51	47.2
Limited knowledge on e-resources use/lacked internet and computer skills	63	58.3
Unaffordable staff development courses due to their prohibitive cost	65	60.2
Inconsistent in-service training courses on use of e-resources	57	52.8
Lacked invitation letters for in-service training courses on use of e-resources	59	54.6

From Table 22, 64 (59.3%), 44 (40.7%), 66 (61.1%), 44 (40.7%), 51 (47.2%), 63 (58.3%), 65 (60.2%), 57 (52.8%) and 59 (54.6%) principals suggested insufficient e-resources, lack of computer rooms/laboratories/furniture, insufficient funding for e-resources use, insecurity, unaffordable internet connection, limited knowledge on e-resource use/lack of internet and computer skills, unaffordable staff development courses due to their prohibitive cost, inconsistent in-service training courses on use of e-resources and lack of invitation letters for in-service training courses on use of e-resources respectively.

The results in Table 22 confirmed that the challenges made teachers frightened from using e-resources in teaching and learning process. Challenges limited use of e-resources in the curriculum. Intensive in-service training courses on e-resources use were urgently needed for teachers. Teachers were hesitant to use e-resources in education because they lacked internet/computer skills. Therefore, lack of information retrieval skills made the level of usage of e-resources to be very low. Significantly, teachers should acquire classroom e-resources skills; otherwise teaching could turn chaotic when e-resources used inappropriately. The research of Patsalides (2013) was in tandem with the results in Table 22. Patsalides' study focused on use of computers in the classroom.

Question item 16 of ETQ sought to find out from teachers challenges encountered when using e-resources in teaching and learning of English language. The findings were summarized in Table 23.

Table 23: Teacher Preparation on Integration of E-resources

n= 152 Teachers of English

Statements	**Responses received (f)**	**%**
Lack of time	56	36.8
Heavy workload	48	31.6
Lack of computer skills	66	43.4

Table23depicted that 56 (36.8%), 48 (31.6%)and 66 (43.4%)teachers were faced with lack of time, heavy workload and lack of computer skills when using e-resources in teaching and learning of English language respectively. Pursuant to National ICT training Policy, teachers were expected to be skilled in using computer applications adequately through either pre-service or in-service training courses. However, Table 23 showed that 66 (43.3%) teachers lacked computer skills. This hindered accessibility of e-resources on internet through computers. Teachers' limited skills had direct influence on innovatory use of e-resources in the classroom. The current results were in line with Drent and Meelissen (2008) study. They determined factors obstructing or stimulating teacher educators to use ICT innovatively.

Furthermore, Table 23indicated that teachers lacked time and computer skills to use e-resources during teaching process. This was slightly different from Taban *et al.,* (2012) study. They demonstrated that many teachers had computer skills but only lacked time to use technologies in the classrooms. They determined difficulties faced by teachers in using ICT in teaching-learning at technical and higher educational institutions of Uganda. Diversely, the study of Ali (2005) concurred with the results in Table 23. Unskilled teachers and lack of time were significant barriers in use of e-resources in education. Heavy workload left them with little time to prepare and help the weak students to learn supported with e-resources. Ali's study examined use of electronic information services among the users of the Indian Institute of Technology (IIT) Library in Delhi, India. The study used both questionnaire and observational methods to collect data.

To sum up, the aforementioned results designated that lack of time, heavy workload and insufficient computer skills impacted negatively on integration of e-resources in education.

Accordingly, interrogation was done to establish problems faced during use of e-resources in teaching and learning of English language, one of the teachers asserted:

> *The school lacks funds to facilitate in-service training courses, buy enough computers, pay internet service providers such as Safaricom, employ enough security officers – burglary is rampant.....*

The study also sought to find out mitigating measures that would enhance integration of e-resources in teaching and learning of English language. Therefore, Question item 13 of PQ sought to find out from principals ways of improving use of e-resources in schools. Findings summarised in Table 24.

Table 24: Preparation for E-resources

n= 108 Principals

Statements	**F**	**%**
Provision of adequate e-resources like computers	74	68.5
MoE to provide sufficient funds for e-resources use in the curriculum	57	52.8
Provision of affordable internet connection	50	46.3
Supporting and encouraging teachers to attend capacity building programs	76	70.4
Enhancing security in public secondary schools	61	56.5
Enhancement of teachers' internet and computer skills	59	54.6

In Table 24, 74 (68.5%), 57 (52.8%), 50 (46.3%), 76 (70.4%), 61 (56.5%) and 59 (54.6%) principals indicated that provision of adequate e-resources like computers, MoE to provide sufficient funds for e-resources use in the curriculum, provision of affordable internet connection, supporting and encouraging teachers to attend capacity building programs, enhancing security in public secondary schools and enhancement of teachers' internet and computer skills would increase integration of e-resources in teaching and learning process respectively.

Specifically, 52.8% principals suggested that MoE provided insufficient funds for use of e-resources in the curriculum. This showed that integration of e-resources demanded substantial funding from the government, donors, sponsors and Non-Governmental Organizations (NGOs).The use of e-resources in education was costly in terms of time and effort required to prepare for and use them. Thus, schools required financial investment in e-resources development and use. Generally, schools had inadequate funds for security enhancement, in-service training courses, purchase and maintenance of computing facilities. The research of Ivan (2007) agreed with the above mentioned results. Ivan's study determined key factors in the use of ICT in primary school classrooms.

Finally, from Table 24, 70.4% principals were right to suggest that teachers to attend capacity building programs. This was due to 58.3% teachers lacked internet and computer skills for information access, retrieval and content delivery in the classroom. The revelation indicated lack of support from education stakeholders to enforce and implement National ICT Policy on training in education. Most schools lacked indicators of quality e-resource leadership in the curriculum. The ICT policy on training enabled teachers to embrace personal support initiative (knowledge, skills and attitudes) for successful implementation of e-resources in schools. MoE and KICD should provide affordable and regular in-service training courses on integration of e-resources to improve teachers and learners attitudes towards e-resources. The results in Table 24 concurred with Keengwa and Onchwari (2008) study. They determined computer technology integration and student learning.

Moreover, to solve challenges of integration of e-resources, Question item 6 of TIS suggested provision of adequate: e-resources, internet connection, funds/budget allocations and security to enhance integration of e-resources in teaching and learning process. On the issue of insecurity, teachers expressed the need to secure computers from burglars to avoid losses.

They supported the use of LoJack software for Windows and Mac computers and elements such as IP address locations and webcam in order to get a stolen computer/laptop easily. The above results concurred with Wambugu (2015) observations. He focused on securing laptops from thieves.

Lastly, respondents also suggested a need to establish a special framework that supported acquisition, selection and use of e-resources, regular enhancement of e-skills and e-resources development and collection policy in education. Such framework would guarantee effective utilization of e-resources in the curriculum. These results agreed with the study of Premchand-Mohammed (2011). Although, through a review of the literature on the shift from print to electronic resources, Premchand-Mohammed study used the experiences of the University of the West Indies (UWI) with a particular reference to the St. Augustine Campus.

4.6 E-resource Pedagogic Methods

E-resource pedagogic activities involved planning, presentation of information, guiding learner's practice and assessing learning progress. Serious planning for teaching started with preparation of a scheme of work followed by a lesson plan. Lesson plan translated the objectives in the schemes of work into specific instructional objectives to be achieved within the lesson. It stimulated the teacher to think in an organised way and to match the ideal standard of teaching more quickly than ever. Thus, Question item 5 of PQ sought to find out how often principals checked and certified lesson plans during and after learning process. The findings summarized in Table 25.

Table 25: Lesson Plan E-Pedagogic Practices

n=108 Principals

Extent Lesson plans checked and certified	Number of Principals (f)	Percentage (%)
Daily	6	5.6
Weekly	21	19.4
Fortnightly	28	25.9
Monthly	49	45.4
Never at all	4	3.7
Total	**108**	**100.0**

Table 25revealed only 6 (5.6%) principals checked and certified lesson plans daily. Although English language was taught everyday (ROK, 2015), the expectation was that principals would check and certify lesson plans daily. To the contrary, the results indicated laxity of principals in checking and certifying lesson plans daily. According to Otunga, Odeoand Barasa (2011) observations, regular check and certification of lesson plans improved learning process in the curriculum. Further, 21 (19.4%), 28 (25.9%), 49 (45.4%) and 4(3.7%) principals ensured that lesson plans were checked and certified weekly, fortnightly, monthly and never at all for learning of English language respectively. The lesson plans were insufficiently checked and certified in education. Importantly, principals should empower HOD languages to ensure regular check and certification of lesson plans in learning process. Lesson plans indicated how learners used their past experiences/knowledge and available e-resources creatively to gain new knowledge through the teacher. Therefore, it showed how students learnt by doing and discovering concepts in English language. This transformed teacher's role from controller of information to counsellor, guide and co-learner in the curriculum.

E-resource Pedagogic methods to be used in class should be decided upon beforehand, not when the teacher enters the classroom. Thus, Question item 11 of PQ sought to find out from principals e-resource pedagogic methods used in learning of English language. The findings were summarised in Figure 5.

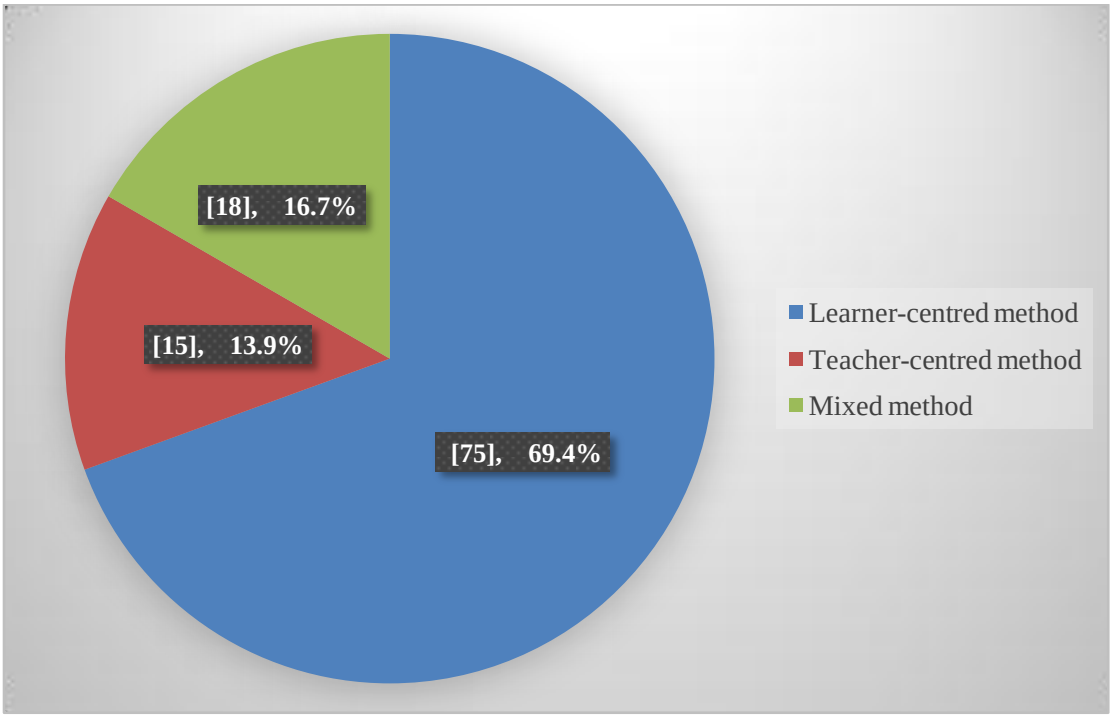

Figure5: Principals' Choice of E-pedagogic Methods used

Figure 5showed that 75 (69.4%), 15 (13.9%) and 18 (16.7%) principals suggested that teachers/schools used learner-centred method, teacher-centred method and mixed method in learning of English language respectively. The results indicated that teachers embraced learner-centred method in learning process. Teacher–centred instruction was no longer the dominant teaching method in the curriculum. Therefore, integration of e-resources brought a shift from a teacher-centred didactic model to a learner-centred constructivist model. Learner-centred method supported with e-resources enhanced learner to learner and learner to teacher interaction during learning session. Teacher-centred method was outmoded. It relied on strategies such as whole-class lecture, rote memorization and chorus answers (call - and - response) which inhibited interactive learning in the classroom. The aforesaid results

concurred with Westbrook, Durrani, Brown, Orr, Pryor, Boddy and Salvi (2013) research. They did a rigorous literature review on pedagogy, curriculum, teaching practices and teacher education in developing countries.

Consistent with Miranda, Morais and Dias (2008) study computer supported technology favoured student-centred learning activities in the curriculum. This research focused on pedagogical approaches for online environment at University of Minho, Portugal. Thus, Question item 6 of PQ sought to find out from principals how often teachers of English incorporated computer(s) in lesson plans. The findings summarized in Table 26.

Table 26: Computer Pre-Pedagogic Activities

n= 108 Principals

Extent of Incorporation	**Number of Principals (f)**	**Percentage (%)**
Very often	2	1.9
Often	12	11.1
Fairly often	78	72.2
Rarely often	11	10.2
Never at all	5	4.6
Total	**108**	**100.0**

Table 26 revealed that English language was taught every day therefore teachers were expected to incorporate computer(s) in lesson plans very often. However, 2 (1.9%), 12 (11.1%), 78(72.2%), 11 (10.2%) and 5 (4.6%) principals showed that teachers incorporated computer(s) in their lesson plans very often, often, fairly often, rarely often and never at all respectively. 85.2% principals very often (1.9%) often (11.1%) fairly often (72.2%) suggested that teachers emphasized what learners were expected to do rather than focusing on what they were expected to know using computers. Incorporation of computers in lesson plans individualized education. Teaching with computer built both the skills and ability to

apply skills to perform a particular task. Computers enabled teachers to practice collaborative and project-based teaching which improved learning process. Importantly, to empower learning through guided inquiry, learners must access e-resources in schools. These results agreed with the study of Ogange (2011). She analysed ICT policy development and practice in teacher education in Kenya 1997 – 2007.

Question item 7 of PQ sought to find out from principals how often teachers of English incorporated CD-ROM in lesson plans. Findings summarized in Table 27.

Table 27: CD - ROM Pre - Planning Pedagogic Process

n= 108 Principals

Extent of Incorporation	**Number of Principals(f)**	**Percentage (%)**
Very often	5	4.6
Often	7	6.5
Fairly often	64	59.3
Rarely often	19	17.6
Never at all	13	12.0
Total	**108**	**100.0**

Table 27revealed that 13(12%) principals indicated CD-ROM was never incorporated in the lesson plans. However, as stated by Ray and Day (1998) study, CD-ROMs were prepared and used easily; therefore the current study expected CD-ROM incorporation in lesson plans frequently. They focused on students attitudes towards electronic information resources. Moreover, e-resources such as CD-ROMs influenced mode of lesson presentation. Hence, non-use of CD-ROM in lesson plans encouraged teacher-centred activities which hindered learner's participation in learning process. 70.4% principals very often (4.6%) often (6.5%) fairly often(59.3%) suggested that teachers placed responsibility for learning path in the hands of the learner and shifted focus of instruction from themselves. CD-ROMs facilitated

the opportunity for student-centred teaching and self-learning activities in the curriculum. It illustrated ways students learnt by creating and co-creating thus enhanced constructive learning through e-resources.

The quality of lessons depended on preparation and presentation of teaching and learning resources (Mayers, 2008).Therefore, Question item 4 of Observation Checklist sought to find out ICT teacher compliant with preparation of professional documents and teaching and learning resources. Findings summarised in Table 28.

Table 28: Professional E-pedagogic Resources

n= 108 Teachers of English

Types of Professional E-pedagogic Resources	**ICT Teacher Compliant**		**ICT Teacher Non-compliant**	
	F	**%**	**F**	**%**
Schemes of work	51	47.2	57	52.8
Lesson plans	20	18.5	88	81.5
Records of work covered	45	41.7	63	58.3
Lesson notes	52	48.1	56	51.9
Teaching and learning resources	47	43.5	61	56.5

In Table 28, 51 (47.2%), 20 (18.5%), 45 (41.7%), 52 (48.1%) and 47 (43.5%) teachers were ICT compliant with preparation of schemes of work, lesson plans, records of work covered, lesson notes and teaching and learning resources respectively. The results revealed that most teachers were ICT non-compliant with preparation of professional documents and teaching and learning resources. Consequently, mode of teaching and learning was not yet e-resource enhanced in schools. Therefore, teachers lacked e-resource pedagogical competence which was attributed to insufficient organisational precondition (vision, policy and culture) and personal support initiative (knowledge, skills and attitudes)in schools. The principals' e-resources leadership must be expressed through organisational precondition aimed to improve

learning process. The research of Indembukhani (2021) was in line with the above mentioned results. He targeted integration of ICT and its contribution to the teaching of English in secondary schools in Kisumu County, Kenya. The study considered teachers, principals and CQA&SO.

In consequence, teachers reported also that HOD of languages ensured that professional documents and teaching and learning resources were ICT compliant. This improved pre-planning of pedagogic activities such as preparation of: schemes of work, lesson plans and lesson notes using application packages such as word processors and power point presentations.

Further, it was important to note that different topics or areas of language required the teacher to use different e-resource pedagogic methods. E-resource pedagogic methods were characterized as follows: Teacher-centred method, learner-centred method and mixed method (teacher-student centred method)that blended teacher's personality and interests with students' needs (Gill, 2013). Gill's study determined effective teaching methods for classroom use. Therefore, Question item 13 of ETQ sought to find out various e-resource pedagogic methods used in learning of English language. The findings were summarised in Figure 6.

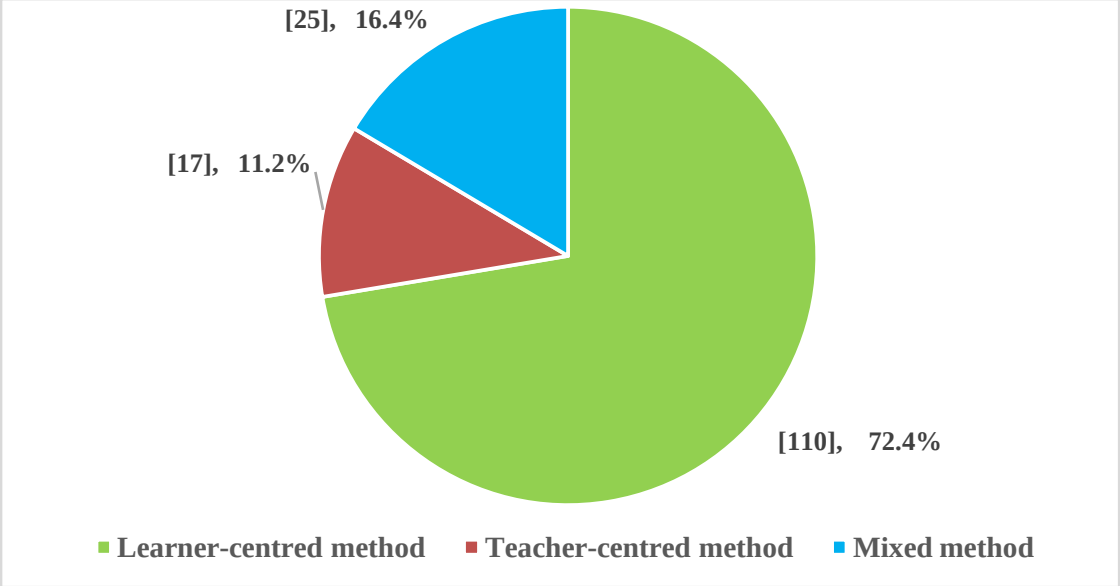

Figure 6: E-pedagogic Methods used in Learning of English

Figure 6 indicated that 110 (72.4%), 25 (16.4%) and 17 (11.2%) teachers used learner-centred method, mixed method and teacher-centred method in learning of English language respectively. The results showed that teachers enjoyed using learner-centred method which used e-resources in learning process. Learner-centred method was hands-on, minds-on and heart-on activities that stirred up learner's interests in learning process. The method encouraged use of discussions, experimentation, teamwork, role play, dialogue, dramatisation, debates, explanations and questions and answers strategies which improved learning outcomes. Therefore, communication, collaboration, cooperation and interaction were more effective than knowledge reproduction approaches.

Interrogation was done to establish why teachers commonly used learner-centred method supported with e-resources in learning of English language; one of the teachers responded that:

> *Learner-centred method involves all learners in the classroom. It gives me enough time to attend to individual students problems. There is student- student, teacher-student and student-teacher interaction. It uses class presentations, group discussions, debates, dialogue, hot seat and role plays activities to enhance listening and speaking skills, writing skills and grammar use.....*

Learner-centred and teacher-centred methods should be integrated for better learning. Mixed method applied strategies used by both teacher-centred and student-centred methods. However, in mixed method, subject information produced by learners was remembered better than same information presented to the learners by the teacher. The above results were in line with Bennaars, Otiende and Boisvert (1994) observation. Further, Question item 8 of Observation Checklist sought to find out e-pedagogic methods used in professional documents. Findings summarised in Table 29.

Table 29: E-Pedagogic Methods used in Professional Documents

n= 108 Teachers of English

E- Pedagogic Methods	Number of Teachers (f)	Percentage (%)
Learner-centred method	81	75.0
Teacher-centred method	10	9.3
Mixed method	17	15.7
Total	**108**	**100.0**

Table 29suggested that 81 (75%), 10 (9.3%) and 17 (15.7%) teachers used learner-centred, teacher-centred and mixed methods in professional documents respectively. 81 (75%) teachers indicated using learner-centred method supported with e-resources. The findings inferred that teachers preferred learner-centred activities such as classrooms talk, role plays, group discussions and dialogue. Collaborative, cooperative and interactive learning enhanced individual and group accountability and positive interdependence in the curriculum. Hence, interactive pedagogies fostered cooperation which led to better teacher/student relationships in education. Learner-centred activities promoted interest, analytical research, critical thinking and enjoyment among students during learning process. Nevertheless, teacher-centred method was centred more on teaching than on learning and the teacher was the main reference to the knowledge. It was the least fruitful teaching method. These results concurred

with Miranda *et al.*, (2008), Hesson and Shad (2007) studies. Miranda *et al.*, (2008) study focused on pedagogical approaches for online environments in polytechnic institute of Braganca, University of Minho in Portugal whereas Hesson and Shad (2007) research targeted student-centred learning model in education.

Question item 7 of LQ sought to find out from learners e-resource pedagogic methods used in learning of English language. The findings were summarised in Figure 7.

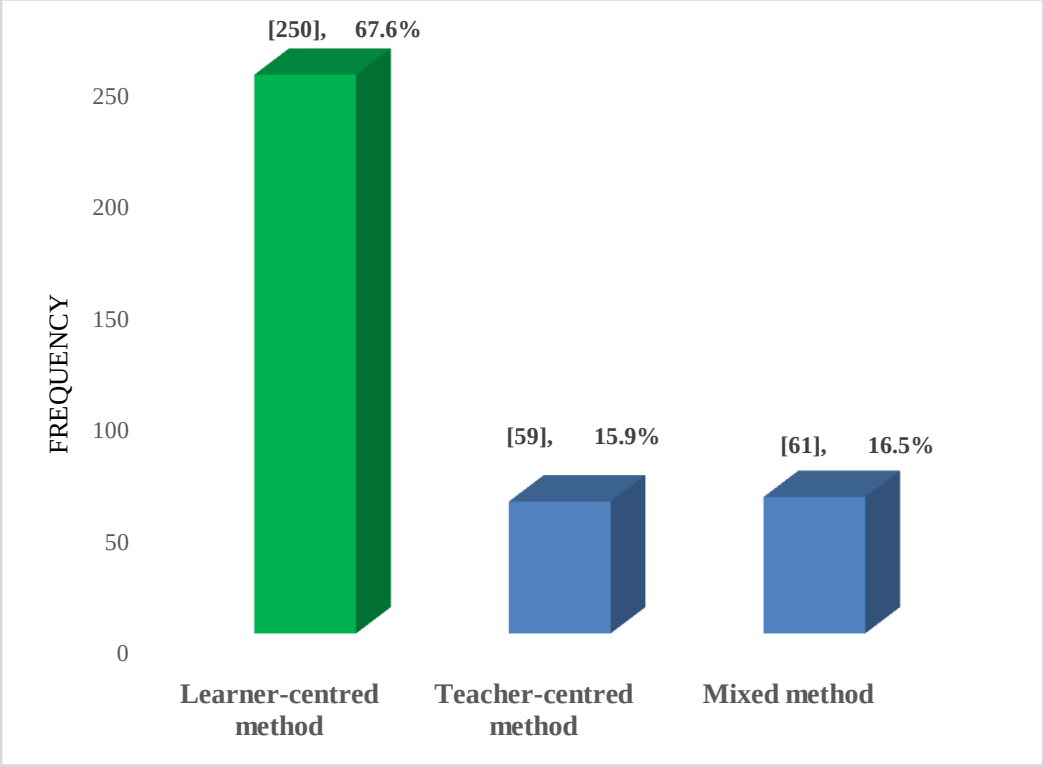

Figure 7: Learners' Suggestions on E-Pedagogic Methods used

In Figure 7, 250 (67.6%), 59 (15.9%) and 61 (16.5%) learners suggested that learner-centred, teacher-centred and mixed methods were used in learning of English language respectively. The results showed that learners liked learner-centred method which used e-resources in learning process. Teacher's involvement of learners during learning session enhanced learner-teacher connectedness and peer learning in the curriculum. Student's centred

activities motivated goal oriented behaviour among learners, hence improved learner's achievement. The research of Monino and Sedkaoui (2015) was in tandem with the results in Figure 7. However, they used descriptive and explanatory research approach. They aimed to promote higher teaching practices through the new interactive technology tools to stimulate educational innovation within the university system.

Contrarily, the study of Ganyaupfu (2013) slightly disagreed with the results in Figure 7. Ganyaupfu's study demonstrated that teacher-student interactive method (mixed method) was the most effective method, followed by student-centred method while teacher-centred method was the least effective teaching method. The F (2, 106) statistic (=10.125; $p<0.05$) and the Tukey HSD post – hoc results indicated significant differences on the effectiveness of the three teaching methods. Therefore, future studies should endeavour to establish which e-resource teaching method is most effective in learning of English language. He investigated the differential effectiveness of teaching methods on students' academic performance. He sampled 109 undergraduate students and used inferential statistics course; students' assessment test scores were derived from the internal class test prepared by the lecturer. The differential effectiveness of the three teaching methods on student academic performance was analysed using the General Linear Model based univariate ANOVA technique.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter provided an overview of the study. It outlined summary of the findings, conclusions and it proposed the relevant recommendations. It also gave areas for further research.

5.2 Summary of Findings

The following were summary of findings done objective of the study by objective of the study.

5.2.1 Availability of E-resources for use

The research findings revealed that all 152 (100%) teachers indicated that their schools had discs recordings, radio, computers, printers, TVs and e-newspapers. However, e-resources available were inadequate for frequent teaching and learning of English language. Thus, there was limited level of integration of e-resources in the curriculum. The ministry concerned never supplied them with e-resources.

5.2.2 Perceptions of E-resources

100% principals indicated that e-resources influenced student learning positively. Simultaneous use of e-resources in education had unlimited benefits for learners and teachers. They increased retention in learning, ensured understanding of concepts, made learning lively and supported teaching and learning activities such as class internet search and internet assignments.

5.2.3 Teacher Preparedness on use of E-resources

The study revealed that although teachers were professionally trained, they rarely used e-resources in education. 58.3% teachers lacked computer and internet skills. 75 (49.3%) teachers felt that pre-service training course prepared them not well on use of e-resources in the curriculum.

Challenges identified by teachers during integration of e-resources included: Insufficient e-resources and funds, inadequate knowledge on e-resources use/insufficient internet and computer skills, exorbitant and inconsistent staff development courses, lack of computer laboratories/rooms, insecurity, unaffordable internet connection and lack of invitation letters for in-service training courses.

5.2.4 E-resource Pedagogic Methods

The findings showed 72.4% teachers used learner-centred method supported with e-resources in learning of English language. It enhanced team work, peer-learning, self – learning, communication, cooperation, collaboration and interaction in the curriculum. However, teacher-centred method prevailed in 16 (14.8%) schools consequently hindered interactive learning in classrooms.

5.3 Conclusions

Based on the findings of the study, the following conclusions were arrived at:

5.3.1 Availability of E-resources for use

Available e-resources were insufficient for frequent teaching and learning process. Teachers blamed the absence of e-resources on school authorities' reluctance to purchase them.

5.3.2 Perceptions of E-resources

Principals, teachers and students had positive attitudes towards e-resources in teaching and learning of English language. They improved academic self-confidence, student-teacher connectedness and academic self-reliance in the curriculum.

5.3.3 Teacher Preparedness on use of E-resources

The study showed pre-service training programs were almost flawed, especially integration of e-resources in education. 152 (100%) teachers participated in the study were professionally trained although they did not exhibit necessary knowledge, skills and attitudes in regard to use of e-resources in the curriculum.

5.3.4 E-resource Pedagogic Methods

Few teachers relied on teacher-centred method in learning of English Language. Thus, there was need for a paradigm shift from teacher-centred to learner-centred instruction where the learner takes the centre stage and the teacher becomes facilitator of learning process.

5.4 Policy Recommendations

Based on the findings, the study further made the following policy recommendations objective of the study by objective of the study.

5.4.1 Availability of E-resources for use

The study recommended that MoE should come up with a program of providing free or subsidized e-resources to every school. Moreover, every educational division must have e-resource centre fully equipped and continually replenished by MoE. From e-resource centre, schools should borrow relevant e-resources for their English language lessons. Therefore, English Language E-resource Centre (ELEC) should be formed to be distributing e-resources to schools.

5.4.2 Perceptions of E-resources

The study recommended:

a) Establishment of Regional English Language E-resource Centre (RELEC) that should be in-charge of assessing acquisition of proficiency in English language skills in schools. This would involve assessing interaction between students, content, teachers and outside experts for effective output in teaching and learning process.

b) KICD should develop and use e-resource model lessons to improve learners and teachers attitudes towards e-resources in the curriculum. E-resource model lessons should be displayed on screen technologies that would act as models of efficiency in education. Display screen technologies included: computers, whatsapp, OHP, CDs and laptops.

c) RELEC should emphasize appropriate use of e-resources so as to improve learning outcomes such as effective teaching and learning through e-resources, enhanced language skills and fluent communication amongst students.

5.4.3 Teacher Preparedness on use of E-resources

From the findings of the study, it was recommended that:

a) Universities and colleges should review their education process on integration of e-resources in order to ensure adequate course coverage. Teacher training institutions must provide appropriate and sufficient support on integration of e-resources in teaching and learning process.

b) MoE in conjunction with KICD should organise frequent refresher courses on integration of e-resources for all practising teachers. This would enhance acquisition of knowledge, skills and attitudes regarding use of e-resources in the curriculum.

c) MoE and schools authorities' should provide adequate funding for integration of e-resources in teaching and learning process. This would ensure provision of sufficient internet connectivity, security, financing staff development courses and purchasing of e-resources in schools.

5.4.4 E-resource Pedagogic Methods

The study recommended that:

a) School administrators should emphasize learner-centred method which usese-resources in learning of English language. This would provide students with discussion environment whereby problems solved cooperatively supported with e-resources.

b) Teachers should use e-resources to generate learner-centred practices that make learning sessions interactive, collaborative, cooperative and interesting. Examples of learner-centred practices included: group work, teamwork, dialogue, discussion, experimentation and inquiry.

c) Teachers should form societies such as E-resource Pedagogic Methods Society (EPMS) to showcase self-learning, peer - learning and discovery learning in the curriculum. Such forums would encourage learners to develop critical thinking skills, creativity and autonomy in learning process.

5.5 Suggestions for Further Research

The following were recommendations for further research:

a) Use of e-resources in teaching and learning of English language, be carried out in primary schools, especially lower primary to determine whether or not use of e-resources has any bearing on conceptualizing concepts in English language. This was

because lower primary was the foundation of secondary, tertiary colleges and university education.

b) There is need to evaluate the value of e-resources as potentially useful for teaching and learning of English language. This would show the importance of using e-resources in the curriculum.

c) Study should be done to evaluate factors influencing teachers' attitudes on use of e-resources in teaching and learning of English language. This was because the study found out that although most teachers were professionally trained, they rarely used e-resources in the curriculum. This may be due to the question of attitude amongst the teachers.

d) A similar study should be done to evaluate integration of e-resources in teaching and learning of English language. This would involve use of descriptive statistics and inferential statistics such as ANOVA and Chi-square to analyse data. The present study did not use inferential statistics in its analysis of data. It only used descriptive statistics that involved frequencies, percentages and means.

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APPENDICES

APPENDIX A: CONSENT FORM

Carefully study the following information before consenting to take part in this study.

STUDY TITLE

ASSESSMENT OF INTEGRATION OF E-RESOURCES IN TEACHING AND LEARNING OF ENGLISH LANGUAGE IN PUBLIC SECONDARY SCHOOLS IN KAKAMEGA COUNTY, KENYA

UNIVERSITY: MASENO UNIVERSITY

RESEARCHER: MUVANGO W. MARK

SUPERVISORS:DR. KOWINO JOASH OBWANA

DR. AJUOGA MILCAH

INVITATION

You are being asked to take part in this research study entitled: Assessment of Integration of E-resources in Teaching and Learning of English language in Public Secondary Schools in Kakamega County, Kenya. Whether or not you take part is your choice. If you don't want to take part, you don't have to give a reason. If you do not want to take part now, but change your mind later, you can pull out of the study at any time.

This sheet will help you decide if you would like to take part. It sets out why this study is being conducted, what your participation would involve, what the benefits and risks to you might be and what may happen after the study ends. We will go through this information with you and answer any questions you may have.

If you agree to take part in the study, you will be asked to sign the consent form at the end of this document. You will be given a copy of both the participant information sheet and consent form to keep.

WHAT IS THE PURPOSE OF THE STUDY?

The purpose of this study is to assess integration of e-resources in teaching and learning of English language in Public Secondary Schools in Kakamega County, Kenya. Also, it will reflect realities of integration of e-resources in the Curriculum.

WHAT WILL HAPPEN

In this study, you will be asked to fill the questionnaires that will be given to you and ticking the number that corresponds to your level of agreement as will be directed.

TIME COMMITMENT

The completion of the questionnaires will take approximately one hour.

PARTICIPANTS' RIGHTS

You may decide to stop being part of the research study at any time without explanation. You have the right to ask that any data you have supplied be withdrawn/destroyed without any penalty whatsoever.

You have the right to omit or refuse to answer or respond to any question that is asked of you (*as appropriate, 'and without penalty'*).

You have the right to have your questions about the procedures answered (unless answering these questions would interfere with the study's outcome). If you have any questions as a result of reading this information sheet, you should ask the researcher before the study begins.

BENEFITS AND RISKS

There are no specific benefits to you. Your participation may benefit future generations by providing useful information about integration of e-resources to teachers' English language/educators. It will also promote practical application of knowledge regarding integration of e-resources in teaching and learning of English language. There are no risks for you in this study.

COST, REIMBURSEMENT AND COMPENSATION

Your participation in this study is voluntary and will not be paid or compensated.

CONFIDENTIALITY/ANONYMITY

The data we collect do not contain any personal information about you. No one will link the data you provided to the identifying information you supplied.

FOR FURTHER INFORMATION

Please feel free to contact the researcher or the supervisors if you have any questions concerns or complaints about the study or if you want to find out the final results of the study contact addresses below.

Researcher: Muvango W. MarkE-mail address: markmuvango@gmail.com.

Tel: 0729582286

Supervisors: Dr. Kowino J. Obwana E-mail address: kojoash@gmail.com

Tel: 0724677173

Dr. Ajuoga Milcah E-mail address: mamildeb@gmail.com

Tel: 0726864897

By signing below, you are agreeing that: (1) you have read and understood all the information above, (2) questions about your participation in this study have been answered satisfactorily, (3) you are aware of the potential risks (if), and (4) you are taking part in this research study voluntarily (without coercion).

Declaration by the Participant:

I do hereby consent to take part in this study.

_____

Participant's Name

_____ _____

Signature Date

Declaration by member of research team:

I have given a verbal explanation of the research study to the participant, and have answered the participant's questions about it. I believe that the participant understands the study and has given informed consent to participate.

Researcher's Name

_____ _____

Signature Date

APPENDIX B: INFORMATION SHEET

MASENO UNIVERSITY
P.O. PRIVATE BAG
MASENO – KENYA

CONTACT DETAILS

MUVANGO W. MARK
P.O. BOX 188 – 50106, SHIANDA – MUMIAS
MOBILE NO: 0729582286.
E-MAIL ADDRESS: markmuvango@gmail.com.

Dear Respondent,

As part of my Doctor of Philosophy in Pedagogy (English) degree, I am undertaking a research study entitled: Assessment of Integration of E-resources in Teaching and Learning of English language in Public Secondary Schools in Kakamega County, Kenya. The study will assess integration of e-resources in teaching and learning of English language in public secondary schools. You are chosen since you have gone through use of e-resources in teaching and learning process and the results of this study will be purely used for the study's purpose and nothing else.

I would like you to assist me by completing the attached questionnaires as per the instruction given in each case. The completion time will take approximately one hour and the questionnaires will thereafter be collected by the researcher upon completion by all respondents.

Your participation is fully voluntary and no one will be victimized whatsoever for failing to take part in this study.

The result of this study will remain highly confidential as the questionnaires will remain anonymous and data aggregated such that individual data cannot be identified.

We will provide a copy of the result to your school administration, which will make them available to you. In case of any queries or complaints, kindly direct them to the above stated contacts. Thank you for considering participating in this study.

APPENDIX C: PRINCIPAL'S QUESTIONNAIRE (PQ)

The purpose of the study for which the questionnaire is designed is to assess integration of e-resources in teaching and learning of English language in public secondary schools in Kakamega County. All your responses and information will be treated with utmost confidentiality and only be used for analytical purposes of the study. Please, give your view by filling in the blank spaces or putting a tick (√) in the appropriate spaces that corresponds with your response.

SECTION A: GENERAL INFORMATION

1. (a)Category of your school:

National [ ]

Extra-County [ ]

County [ ]

Sub-county [ ]

(b) Gender:

Male []

Female []

2. Total number of teachers of English:

i. TSC ----------

ii. BOM ----------

3. What is the current enrolment of the Form Two Class?.....

SECTION B:INTEGRATION OF E-RESOURCES

4. Indicate the number of Form Two teachers of English in your school as per their qualifications shown below:

Qualification	Number of Teachers
Masters	
Bachelor of Education (B. ED)	
PGDE	
Diploma	
S1	
Untrained Form 4 (mentor)	
Others (specify)	

5. When do you check and certify teachers of English lesson plans.

Daily	[ ]
Weekly	[ ]
Monthly	[ ]
Fortnight	[ ]
Never at all	[ ]

6. How often do teachers of English incorporate computer (s) for English teaching in their lesson plans?

Very often	[ ]
Often	[ ]
Fairlyoften	[ ]
Rarely often	[ ]
Never at all	[ ]

7. Do teachers of English incorporate CD – ROM in their lesson plans?

Vey often	[ ]
Rarely often	[ ]
Often	[ ]
Fairly often	[ ]
Never at all	[ ]

8. Do teachers of English use the following in teaching English language (Tick Appropriately)

Internet search/ use	[ ]
Word Processor	[ ]
Computer Games	[ ]
Internet Assignments	[ ]
Simulation software	[ ]

9. How do you ensure that teachers of English use appropriate-resources for English teaching? .....
.....

10. Suggest ways in which e-resources can influence students learning of English?
.....
.....

11. State e-resource pedagogic methods used in learning of English.....
.....
.....

12. What are the challenges of using e-resources in teaching and learning of English?
.....
.....

13. Suggest ways of improving the use of e-resources in your school?
.....
.....

APPENDIX D: ENGLISH TEACHER'S QUESTIONNAIRE (ETQ)

The purpose of the study for which this questionnaire is designed is to assess integration of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya. All your responses and information will be treated with utmost confidentiality and only used for analytical purposes of the study. Please give your views by filling in the blank spaces or putting a tick (√) in the appropriate spaces that corresponds with your response.

SECTION A: PRELIMINARY INFORMATION.

1. (a) Gender: Male []
   Female []
   (b) Category of your school:

National [ ]
Extra-County [ ]
County [ ]
Sub-county [ ]

   (c) What is your highest professional qualification?
   S1 []
   Diploma []
   B.ED [ ]
   M.Ed [ ]
   Others.....

2. For how long have you taught English in secondary schools since your professional certification?.....Years

3. Have you attended any in –service training course/ webinar on use of e-resources since professional certification?

   YES [ ] NO[ ]

If YES indicate the course attended, year of attendance and strength / weakness of the course(s).

Course	**Course attended/ covered**	**Year of Attendance**	**Comments**

If No, give reasons why?.....

.....

.....

SECTION B: INTEGRATION OF E-RESOURCES IN TEACHING AND LEARNING OF ENGLISH LANGUAGE.

4. Which e-resources do you use in teaching of English language? (Tick appropriately)

Types of E-resources	**Tick Appropriately**	**Comments**
CD – ROM Storybook		
Computer Games		
Internet Assignment		
Class Internet Search		
Software Drills and Practices		
E-mail		

5. Do what degree of adequacy did university/college training course prepare you for e-resources use in teaching and learning ofEnglish?

Very adequate [ ]

Fairly adequate [ ]

Adequate []

Inadequate [ ]

Very inadequate [ ]

6. (a) State the number of e-resources available in your school for English teaching by completing the table below. For each instructional facility/materials/resources, indicate by ticking (√) in the right row whether: Not Available, Inadequate, Adequate, or More than Adequate.

Media Class		Number of e-resources available	Not Available	Inadequate	Adequate	More than Adequate	Comments
Audio	Disk recordings Video cassette recorder(VCR) Computer lab Radio Resource Person (e-person) Laptop computer						
Visual Projected	Film strip slides Transparencies OHP						
Projected Multimedia	Electronic whiteboards CD – ROM disc Computer(s) mediated materials Printer E-reader E-Newspaper E-Magazine E-Journal						
Audio Visuals	TV Mobile Video Films VCR						

(b) In your opinion, suggest ways to improve e-resources usage in your school.

.....

.....

.....

7. From the e-resources available above, which ones are available for the followingintegrated language skills?

Integrated language skills	E-resources available for teaching	Comments
Listening and speaking		
Reading and Listening		
Reading and Writing		
Writing and Grammar use		
Others		

8. How do you obtain various e-resources for use in teaching of English language? (Tick appropriately).

Statements	Tick appropriately	Comments
Students make them		
The ministry supplies		
The school buys them		
I borrow them from other institutions		
Other sources (specify)		

9. What is your opinion on television in teaching and learning of English language? (Tick appropriately).

Statements No.	Strongly Agree 1	Agree 2	Undecided 3	Disagree 4	Strongly disagree 5
Provides some help in teaching					
Provides rich experience					
Expands curriculum					
Limits curriculum					
Has no effect on curriculum					
Improves curriculum					
Improves quality of overall programs					

10. Which general tool program do you use during English teaching? (Tick appropriately)

Word Processors [ ]

CD ROM Software []

Facebook [ ]

Whatsapp [ ]

Instagram [ ]

Give reasons: .....

.....

11.How many times teachers use email during teaching and learning? (Tick appropriately)

Duration	**Tick Appropriately**	**Comments**
Daily		
Weekly		
Monthly		
Fortnight		
Never at all		

12.Indicate how much you use e-resources in the following content areas.

Content Area	**Very Often**	**Often**	**Fairly Often**	**Rarely Often**	**Never at all**	**Comments**
Speaking and listening						
Reading and writing						
Reading and Listening						
Writing and Grammar use						
Others						

13. Suggest various e-resource pedagogic methods used in learning of English?

.....

.....

14. What are the challenges of using e-resources in teaching and learning of English?

.....

.....

.....

15.Which e-resource pedagogic methods enhance learning of English?

.....

.....

.....

16. What are the challenges of using e-resources in teaching and learning of English language?

.....

.....

17. Indicate how you access the content of e-resources(Tick appropriately)

Content access	**Tick appropriately**	**Comments**
On computer screen		
On phone screen		
Download the content in storage devices		
Took print out from e-resources		
Others		

APPENDIX E: LEARNER'S QUESTIONNAIRE (LQ)

The purpose of this study for which this questionnaire is designed is to assess integration of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya. All your responses and information will be treated with utmost confidentiality and only used for analytical purposes of the study. Please give your views by filling in the blank spaces or putting a tick (√) in the appropriate spaces that corresponds with your response.

SECTION A: GENERAL INFORMATION

1.(a) Gender: Male []
Female []

(b) Category of your school:

National [ ]
Extra-County [ ]
County [ ]
Sub-county [ ]

(b) What was your English score in the end of Termexam?.....

2. Comment on the learning and teaching of English in your school.....

.....

SECTION B: INFORMATION ABOUT INTEGRATION OF E-RESOURCES IN TEACHING AND LEARNING OF ENGLISH LANGUAGE.

Below are statements about the use of e-resources in teaching and learning of English language. Each statement has five possible answers: 1=Strongly Agree [SA]; 2=Agree [A];

3=Disagree [D]; 4=Undecided [U]; and 5=Strongly Disagree [SD]. Please choose only one answer for each statement that best describes your view/opinion by putting a tick (√) appropriately.

3. Do teachers use the following in the teaching of English language?

E-resource use **No.**	**SA** **1**	**A** **2**	**U** **3**	**D** **4**	**SD** **5**	**Comments**
Class internet search						
Internet assignments						
Computer Games						
Software drills and practices						
Word processor						
CD-ROMs						
E-mail use						

4. What is your opinion on e-resources use in teaching and learning?

(Tick appropriately)

Statements **No.**	**SA** **1**	**A** **2**	**U** **3**	**D** **4**	**SD** **5**	**Comments**
Provides some help in learning						
Have richer experience in learning						
Concepts are well understood						
Ensures longer retention						
Concepts become lively during learning						

5. What is your attitude of television use in learning of English language?

(Tick appropriately)

Statements **No.**	**SA** **1**	**U** **2**	**A** **3**	**D** **4**	**SD** **5**	**Comments**
Television teacher is better prepared, organised, covers course better						
Otherwise an available opportunity for education						
No interruptions						
Cannot ask question						

Lack of personal contact with teacher						
TV boring, monotonous, difficult to pay attentions						
The TV teacher was too fast, and if one got lost s/he could not catch up						

6. Do e-resources influence your learning of English Language?

(Tick appropriately)

Statements	**Tick appropriately**	**Comments**
Strongly agree		
Agree		
Undecided		
Strongly disagree		
Disagree		

7. Suggest various e-resource pedagogic methods usedin learning of English language.....

.....

.....

8.Which e-resource pedagogic method enhances learning of English language?

.....

.....

.....

9.Whatchallenges face use of e-resources in your school? .....

.....

.....

.....

APPENDIX F: OBSERVATION CHECKLIST (OC)

Upon visiting the schools the researcher will seek to make the following observations in public secondary schools.

Name of school.....

Category of your school:

National [ ] Extra-County [ ]

County [ ] Sub-county [ ]

1. Presence of computer laboratory

2. The number of computers in the school.

Type of Computers	**Number**	**Comments**
Desktop		
Laptop		

3. The location of e-resources for teaching and learning of English language

Location of E-resources	**Tick appropriately**	**Comments**
Computer room		
Administration office		
HoD Languages Office		
School's E-resource Centre		

4. Preparation of professional documents and teaching and learning resources by teachers of English

Professional resources	**ICT Compliant**	**ICT Non compliant**	**Comments**
Schemes of work			
Lesson plan			
Record of work			
Lesson notes			
Teaching and learning resources			

5. If there is electricity supply and generator(s) for power back up

Facility	**Available**	**Not available**	**Comments**
Electricity			
Generator (back up)			

6. Access to the internet connection

Types	**Tick**	**Comments**
LAN		
Satellite		
Modem		
Wireless internet connection		
Cable		

7. Back up available in the school

Back up	**Tick**	**Comments**
Cloud computing		
Phone's memory		
Flash disks		
CD		
Others		

8. E-resource pedagogic methods used in the professional documents

Types of Pedagogic Methods	**Tick**	**Comments**
Learner-centred method		
Teacher-centred method		
Mixed method		

9. E-resource documented pertinent for the following content areas

Content Areas	**Pertinent e-resources**	**Comments**
Listening and speaking		
Reading and writing		
Writing and Grammar use		
Reading and Listening		
Others		

APPENDIX G: TEACHER'S INTERVIEW SCHEDULE (TIS)

Name of school.....

Category of your school:

National [ ]

Extra-County [ ]

County [ ]

Sub-county [ ]

1.Suggest ways in which the following e-resources influence the teaching of the English language?

E-resources	**Influence in teaching of English language**
Computer	
OHP	
CD-ROMs	
Television	
Video	
Film	
Internet	
Camera	
Discs recording	
VCR	
Radios	

2. Which in-service training course have you attended on use of e-resources in teaching and learning of English language?

3.Why do you use discs recording commonly in teaching and learning of English language?

4. Why do you use learner-centred method in learning of English language?

5. Which problems do you face when using e-resources during teaching and learning of English language?

6. What practical suggestions would you make to improve integration of e-resources in teaching and learning of English language?

7. How do you store your work when using e-resources in teaching and learning of English language?

8. Did university/college training course prepare you for e-resources use in teaching and learning of English language?

9. How do you use content of e-resources?

10. What is the degree of adequacy that university/college training prepared you for use of e-resources in English teaching in secondary schools?

11. Why do you prefer flash discs and CD discs to store your work?

APPENDIX H: MoE Policy on Integration of E-resources

Since 1980s integration of technological resources in education was compulsory in the developed nations. However, in developing countries such as Kenya, ICT was introduced recently consequently faced numerous challenges in the curriculum (MoE, 2006). The challenges influenced learners negatively. Studies showed that majority of learners were computer illiterate thus lacked skills and abilities to join workforce or tertiary education (MoE, 2012).

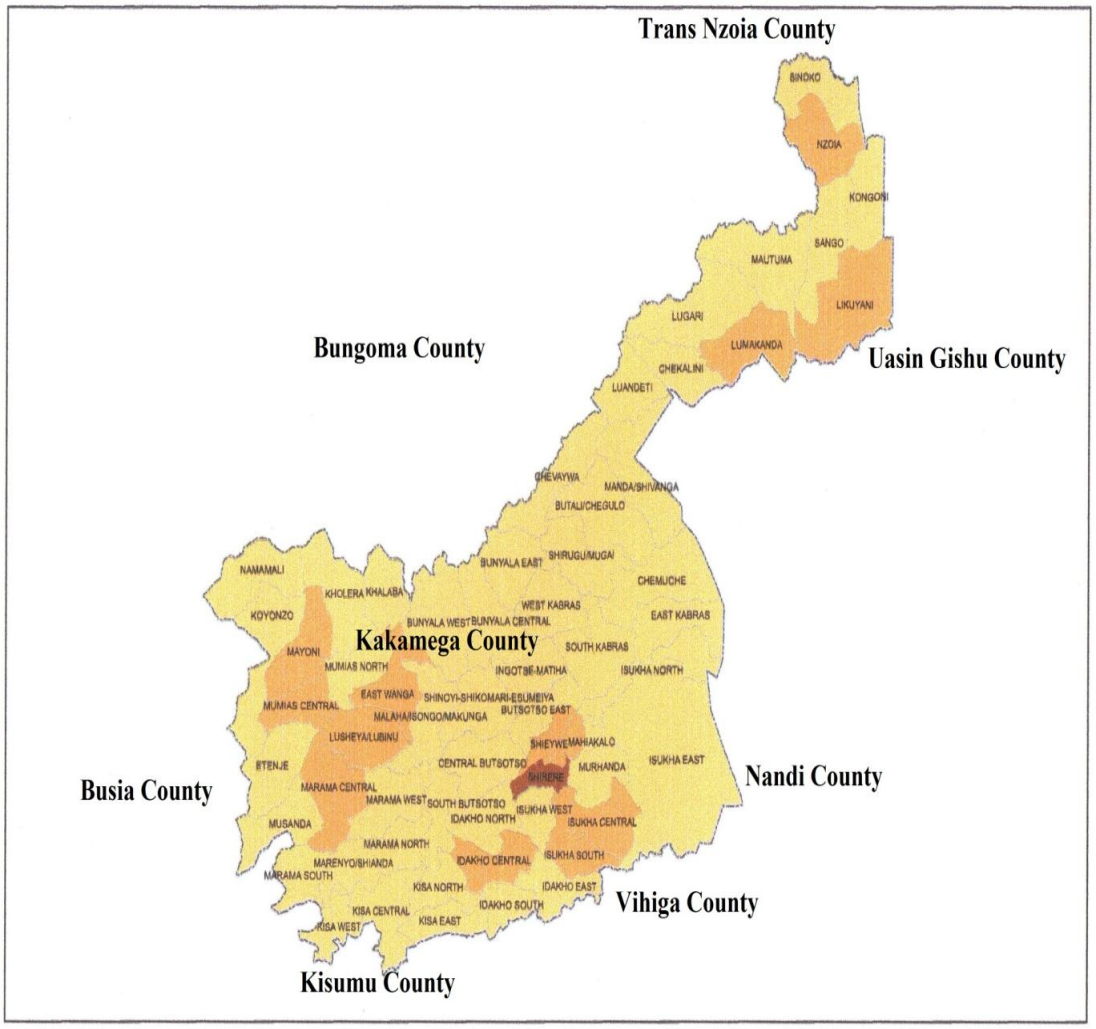
The National ICT Policy and E-Government Strategy documents recognized that an ICT literate workforce was the foundation on which Kenya would become knowledge – based economy. They focused on impact of e-resources in education. This was highlighted in various governmental strategies and policies including the need for attainment of National Education goals and Vision 2030. The National Stakeholders Conference on Education and Training held on 27th to 29th November, 2003 led to the development of national policies on ICT: The e-government Strategy2003; The Kenya Vision 2030; Sessional Paper 1, 2005, Chapter VIII on ICT; The National ICT Policy, 2006 (ROK, 2018).

The following strategies and policies and bodies were established and mandated to implement integration of technology in education sector: The ICT Strategy for Education and training, 2006; KESSP II – ICT was one of the investment programmes for ICT; The National ICT Strategy in Education and Training (MoE, 2006); ICT Integration Team (2008); EMIS National ICT Innovation and Integration Centre (2010); Representation in directorates, CEMASTEA, KEMI, KICD, KNEC, VVOB, N13C, (ROK, 2018; MoE, 2012; MoE, 2005).

Reported achievements in education included: ICT integration training manual developed, National ICT Innovation and Integration Centre launched and was operational (www.ni3c.net), National education portal developed and operationalized (www.elimuportal.net), National Teacher orientation programme (KICD) www.elimika.ac.ke, (Ministry of Education, Kenya, 26th – 27th, January, 2012).

The MoE also acknowledged the need to reform the secondary school curriculum. The ministry emphasized knowledge production however knowledge reproduction was discouraged in schools. Therefore, integration of e-resources increased engagement among learners, learning among learners and retention rate in the curriculum (MoE, 2012). It was from this background that the study assessed integration of e-resources in teaching and learning of English language in public secondary schools in Kakamega County, Kenya.

APPENDIX I: KAKAMEGA COUNTY MAP



APPENDIX J: LOACTION OF KAKAMEGA COUNTY IN KENYAN MAP

KEY

Kakamega County

APPENDIX K: MUERC RESEARCH APPROVAL LETTER

MASENO UNIVERSITY
SCHOOL OF GRADUATE STUDIES
Office of the Dean

Our Ref: PG/PHD/00002/012

Private Bag, MASENO, KENYA
Tel:(057)351 22/351008/351011
FAX: 254-057-351153/351221
Email: sgs@maseno.ac.ke

Date: 15th January 2020

TO WHOM IT MAY CONCERN

RE: PROPOSAL APPROVAL FOR MUVANGO WANGILA MARK — PG/PHD/00002/2012

The above named is registered in the Doctor of Philosophy in Pedagogy Programme in the School of Education, Maseno University. This is to confirm that his research proposal titled "**Evaluating Integration of E-Resources in Teaching and Learning of English in Public Secondary Schools in Kakamega County, Kenya**" has been approved for conduct of research subject to obtaining all other permissions/clearances that may be required beforehand.

Prof. J.O. Agure
DEAN, SCHOOL OF GRADUATE STUDIES

APPENDIX L : RESEARCH PERMIT

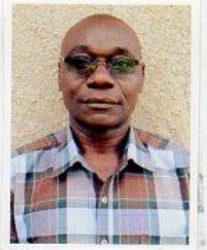
REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **832607**

Date of Issue: **11/February/2020**

RESEARCH LICENSE



This is to Certify that Mr.. MARK WANGILA MUVANGO of Maseno University, has been licensed to conduct research in Kakamega on the topic: EVALUATING INTERGRATION OF E-RESOURCES IN TEACHING AND LEARNING OF ENGLISH PUBLIC SECONDARY SCHOOLS IN KAKAMEGA COUNTY,KENYA for the period ending : 11/February/2021.

License No: **NACOSTI/P/20/3561**

832607

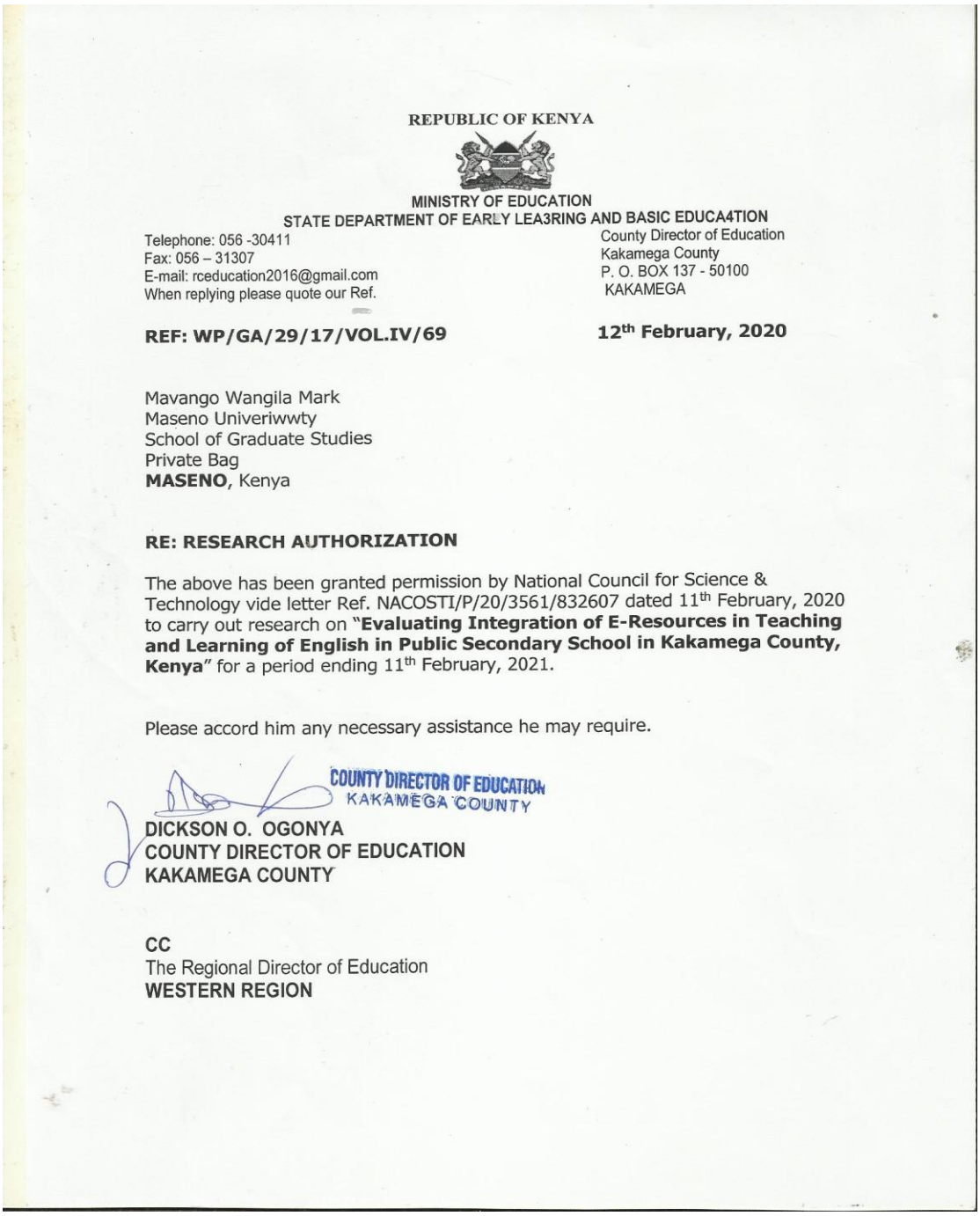
Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

APPENDIX M: RESEARCH AUTHORIZATION



REPUBLIC OF KENYA

MINISTRY OF EDUCATION
STATE DEPARTMENT OF EARLY LEA3RING AND BASIC EDUCA4TION

Telephone: 056 -30411
Fax: 056 – 31307
E-mail: rceducation2016@gmail.com
When replying please quote our Ref.

County Director of Education
Kakamega County
P. O. BOX 137 - 50100
KAKAMEGA

REF: WP/GA/29/17/VOL.IV/69

12th February, 2020

Mavango Wangila Mark
Maseno Univeriwwty
School of Graduate Studies
Private Bag
MASENO, Kenya

RE: RESEARCH AUTHORIZATION

The above has been granted permission by National Council for Science & Technology vide letter Ref. NACOSTI/P/20/3561/832607 dated 11th February, 2020 to carry out research on **"Evaluating Integration of E-Resources in Teaching and Learning of English in Public Secondary School in Kakamega County, Kenya"** for a period ending 11th February, 2021.

Please accord him any necessary assistance he may require.

COUNTY DIRECTOR OF EDUCATION
KAKAMEGA COUNTY

DICKSON O. OGONYA
COUNTY DIRECTOR OF EDUCATION
KAKAMEGA COUNTY

CC
The Regional Director of Education
WESTERN REGION