EVALUATION OF THE   TEACHER FACTORS ON THE INTEGRATION OF INFORMATION COMMUNICATION TECHNOLOGY INTO TEACHING AND LEARNING IN PUBLIC PRIMARY SCHOOLS IN NAIROBI COUNTY, KENYA

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DECLARATION AND APPROVAL

This thesis is my original work and has not been presented for award of degree in any other university

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This thesis has been submitted for review with our approval as university supervisors

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DEDICATION

I dedicate this work to my Beloved husband George Otieno, my sons, Vincent Odhiambo, Otieno Evans Omondi Otieno, Kelly Ochieng Otieno, Ken Aswan and my daughter Mercy Aluoch Otieno Nyar Boro. My Family was my Inspiration throughout my Postgraduate Studies and for them I continuously thank God.

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ABSTRACT

Information Communication Technology (ICT) is perceived as a catalyst for change in teaching styles, learning approaches and accessing information in the world. It can be used to analyze, present information in the classroom, to facilitate delivery of instructions and learning process. ICT enables access to ideas and experience from a wide range of people, communities and cultures. It is for this reason that most countries have integrated ICT into their teaching in elementary schools. Kenya has made the education system an avenue of equipping the learners with ICT skills through provision of ICT facilities and equipment's in   schools. The government in 2018 issued ICT tablets in primary schools all over Kenya and every school was expected to have integrated ICT into teaching. However, most schools were still using traditional methodology in teaching. This prompted the study to evaluate on   the effect of teacher factor on the integration of ICT in teaching and learning. The study aimed at evaluating the effect of teacher factors on the integration of ICT in primary schools in Kenya. The study specifically evaluated on Teachers' pedagogical skills, Teachers' competence in ICT, Teachers' attitude and Teacher's gender effect on ICT integration in teaching. The study adopted the descriptive survey research design to collect the data. The researcher used Interview schedule and questionnaires as research instruments. The sample was selected using stratified random sampling and simple random sampling techniques. The population of the study was 1772. This included both teachers and head teachers in Nairobi County; the study applied 30% of the total population of 1772 to obtain a sample size of 532 respondents   which was the sample size of the study. The study was guided by Innovation Diffusion theory by Rodgers 2003 which explains on how ideas diffuse into a given population. For head teachers and analysed.as follows, Quantitative data was analyzed using descriptive statistics with the aid of SPSS version 21. Qualitative data from interviews were organized into narratives and analysis revolve around the data reduction, organization and matching. The study found that majority of respondents had neither accessed computers nor internet in their respective schools. Teachers demonstrated deficiency in understanding of ICT operations and concepts and from the respondents, it was noted that there was low number of females integrating ICT in teaching. The study concludes that, Pedagogical Skills, Attitude, Competency and Gender influenced the Integration of ICT into teaching and established that teacher's factors had a negative influence in the integration of ICT into teaching. Therefore, the study recommends that as there was need for more training in pedagogical skills in the integration of ICT, need to encourage both gender to integrate ICT into teaching and for motivation for teachers to improve their attitude towards integration of ICT into teaching. Based on the findings the study recommends adequate ICT training to improve the teachers' competency, attitude, and skills in integrating ICT into teaching.

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LIST OF ABBREVIATION AND ACRONYMS

CAK	-	Communication Authority of Kenya
CPF	-	Computer Practice Framework
EFA	-	Education for All
ERS	-	Economic Recovery Strategy
GIS	-	Geographic Teachers' Competence
ICT	-	Information, Communication and Technology
KESSP	-	Kenya Education Sector Support
LMS	-	Learning Management System
MDG	-	Millennium Development Goal
MoE	-	Ministry of Education
MOEST	-	Ministry of Education Science and Technology
UNESCO	-	United Nations Education, Social and Cultural Organization

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Information, Communication Technology (ICT) is a catalyst for change in styles of teaching, approaches of learning and information access Apoyo, (2011). Concepts of ICT are evolving. It covers any product that will store, retrieve, manipulate, transmit, or receive information electronically in a digital form. The application of ICT into teaching has changed regular methods of learning and recommends the need to reexamine education regarding a more current setting Apoyo, (2011). ICT can be used to establish, develop, analyze and present information in a classroom situation with set pedagogical skills, competence, and availability of resources, as well as to model situations and solve problems, Abduls, (2010).ICT enables one to rapidly access ideas and experiences from a wide range of people, communities, and cultures allowing students to collaborate and exchange information on a wide scale. In this way it incorporates computing devices ranging from handheld calculators to super computers. ICT comprises the full range of display and projection devices used to view computer output, the local area networks and wide area networks that enables people and computer systems to communicate with each other. ICT also consists of digital cameras, computer games, tablets, cell telephones, telecommunication satellites, and fiber optics computerized machinery, and computerized robots.

The term ICT as applied to education, refers to technologies which include computers, tablets, the internet, broadcasting technologies (radio and television), and telephones that can encourage conveyance of guidance, yet additionally the learning processes itself (Daniel, 2006) These technologies have been identified in the whole world as

an important tool for facilitating a new paradigm of learner-centered education that supports learners' needs through differentiated and personalized instruction Abduls, (2010). Components such as providing interactive content, giving immediate feedback, diagnosing student needs, providing effective remediation, assessing learning, and storing examples of student work are critical elements in digital technology that is able to support learner-centered instruction for diverse learners (Bush & Mott, 2010; Regolith., 2010)

ICT can also advance global cooperation and networking in education and expert development. There is a scope of ICT alternatives from video conferencing through multimedia conveyance to web sites which can be utilized to address the difficulties teachers encounter today (Russel & Brandley 2010). Actually, ICT will be able to give more adaptable and valuable ways for lifelong proficient development for today's teachers. Ely Donald (2010) observed that most counties spent as follows in the ICT sector: in the United Kingdom, the government expense was £2.5bn (Nut, 2010), in the United States, the expenditure on K-12 schools and higher education institutions was $6 billion and $4.7 billion respectively in 2012 (Nut, 2010) and in New Zealand, the government spends over $410 million consistently on schools ICT infrastructure.

In the Philippines, ICT has been incorporated into the Curriculum Development Division (CDD) of the Bureau of Elementary Education. Teachers countrywide are trained on how to produce Computer Assisted Instructional Materials (CAIMs) in Math, Science and English subjects (Young S2010). Then CDD dispenses the materials generated by the participating teachers to schools nationally, Drexler (2010). Pre-elementary education, in some schools, the pupils are already having computer as a subject. Other non-computer degree courses in tertiary are also incorporated in Computer Technology as part of their curriculum. ICT is increasingly becoming vital

in our daily lives and in our educational system. There is a rising demand for educational institutions to use ICT to teach the skills and knowledge students need for the 21st century (Van Braack, 2012). Understanding the impact of ICT on the workplace and regular life, today's educational institutions try to rebuild their educational curricula and classroom facilities, in order to bridge the existing technology gap in teaching and learning. This rebuilding cycle requires effective combination of technologies into existing environment in order to provide learners with information of specific subject areas, to promote significant learning.

E-learning, on the other hand, refers to the purposeful use of electronic systems or computer by the teachers in support of the learning process (Allen, 2010). Most schools in Africa have integrated e-learning into the system and this is seen as a result of the, presence of ICT Infrastructure in a school is a pointer to an enabling environment for e-learning. This means that e-learning is only possible when ICT infrastructure has been put in place, hence the need to find out whether they are in place and whether teachers have acquired skills in integrating the use of the ICT facilities in teaching (Finger, 2010).

Finer (2010) concluded that ICT is profoundly applied for distance education dependent on executing agencies, students targeted and objectives to be accomplished at university level. The utilization of ICT, generally, has gotten more frequent in all levels from primary, to university level, with the existence of internet and world web, the internet is becoming the largest collection of information in the world, yet in Kenya still a very low percentage of schools are integrating ICT into teaching hence the need to evaluate on teacher factors effect on integration.

Although numerous nations are still at the start of using new technologies, its utilization in education cannot be underestimated (Carnoy & Rhoten, 2002). Tilya (2008) indicated that ICT seems to have the ability to change the nature of education: where and how learning happens and the functions of students and teachers in the learning process. Naidoo (2003) presents three central points, or advantages of ICT: (1) ICT can bring about improved learning; ICT offers the greatest help to learners from disadvantaged backgrounds; and it impacts the general public where the students live. Regardless its potentials, various critiques on the use of ICT in education have arisen. Two specific observations serve to temper expectations: first, there has been a disappointingly slow uptake of ICT in education despite the fact that high investments have taken place in improving access to technologies and in improving the skills of teachers and learners; secondly, there hasn't been an educational upheaval in teaching and learning (Selwyn, 2007). According to Becker (2000) computers have not changed teaching practices until now. UNESCO (2004) contends that the capability of ICT may not be optimized if there is no shift in the education paradigm.

Parchler (2010) conducted a research on the application of ICT in education and concluded that Information Communication Technology has transformed the eminence of education globally leading to students embracing ICT tools (Finger, et al 2011). He stated that by integrating ICT during regular classroom instruction teachers exhibit to the learner, the innovative ways of teaching and learning (Steketee, 2010). Nations like United States, Australia, Japan, Malaysia, and the Philippines have ongoing initiatives on ICT integration in education. Some have even created competency standards for technological use (Bitter & Pierson, 2005). This study intended to find out whether the situation is similar in Kenya'

However, integrating ICT in teaching is a complex process of educational change and the extent of integration in many countries is extremely varied and in most cases very limited Kirschner (2010). Young Africans in primary and secondary colleges, show there is positive movement towards integrating ICT technology. ICT has helped to improve and expand education in African countries although minimal concentration has been done on the teacher factor (NEPAD African Commission, 2007). Further studies established that computers have not transformed teaching practices (Becker, 2000). However, there is need to point out that lack of teacher's knowledge on the use of computers and software can seriously limit what teachers can do in classroom work, with regards to integration of ICT. Hence, there is the need to look at teachers' factors influence on the integration of ICT which this study is specifically intended for.

By integrating ICT during regular classroom instruction, the teacher demonstrates to the learners the innovative ways of teaching and learning (Steketee, 2010). Countries like United States, Australia, Japan, Malaysia, and the Philippines have ongoing initiatives on ICT integration in education. Some have even created competency standards for technological use (Bitter & Pierson, 2011). However, integrating ICT in education is a complex process of educational change and the extent of integration in many countries is extremely varied and in most cases very limited (Kirschner, 2010).In Africa, Olson (2010) developed the idea that the computer offers teacher ways to enhance what and how they teach, but at the same time threatens those very practices by calling them into question. The very presence of the computer says something about what the teacher values; it symbolizes the teacher's interest in modern trends and their capacity to cope with the latest teaching technologies.

However, the computer also threatens illusions which teachers have about what they are doing (Solomon, 2006, Watson, 2008).

(Solomon 2006) in African teachers think computers improves delivery in class; others imagine that computers assist teachers in facilitating learning better. Olson (2010) further adds that teachers act to protect their influence over core elements of their work, such as covering the curriculum and maintaining their credibility. However, these strategies for maintaining class room influence may erode the potential of computer-based teaching. Achieving the full benefits of computers in the classroom may require the teacher under observation to tolerate more ambiguity, to increase individual attention, and to engage students in divergent thinking. All of these create risks. These risks are managed, but over protection of these core elements may set a limit to reform of the curriculum through computer-based teaching unless teachers and software designers look critically at the way on   how integration of ICT can be (effectively with well trained teachers (Watson 2010). Lack of trained teachers may affect the effectiveness. This influence of teacher factors may affect integration either positively or negatively hence the need for this study in Kenya

In Kenya, the government has made education the avenue for equipping the nation with ICT skills in order to create a vibrant and sustainable economic growth. The national ICT policy was launched in 2006 in response to issues raised in Sessional Paper No. 14 of 2012 according to the Government of Kenya (2011). It was meant to assist the nation to achieve integration of ICT into teaching as part of the Millennium Development Goals. Its principal objective was to facilitate sustainable economic growth and development, and poverty eradication through productive and effective technologies. It further aims at pursuing progress towards full socio-economic through universal access to ICT. There has been an attempt to step up the integration

of ICT resources and facilities in most part of the country especially in Nairobi which is a metropolitan area with adequate facilities, despite that, only 30% have integrated ICT into teaching, raising the questions on whether the teacher factors could be influencing the integration especially at primary level. However, current studies done in Kenya shows that there are only a few public primary schools that have integrated ICT into teaching. Several studies have been done on the student's factors and resources on the integration of ICT (Rodgers, 2013).

According to the (RIA ICT report 2011 -2012) the rate of ICT literacy in Kenya is 21.2% which is the second highest after South Africa which has a literacy rate of 29.1%, and yet the education sector in Kenya still is dragging behind in integration of ICT in education sector. In a report for Communications Commission of Kenya, Oboyo (2011) specified a statistical proof to exhibit difficulties confronting all Counties in Kenya with respect to implementation and use of Information and Communications Technologies (ICTs). According to Oboyo (2011), six Counties in Kenya exhibited low internet users in education sector specifically in primary schools including Nairobi county which had (1.9%), Marsabit County (1.6%), Turkana County (1.95%), Wajir County (1.5%), West Pokot County (1.5%) and Mandera County (1.2%). Oboyo (2011) had documented people's access to internet in Nairobi County, that is, his own home (0.17%); in education centers (0.16%) on mobile phones (0.49%). This shows a low level of individuals getting access to computers and internet in schools in Nairobi County specifically in education sector hence the need to evaluate the teacher factors effect on the integration of ICT in Nairobi County.

Oboyo (2011) further noticed that 92% of residents in Nairobi County do not have understanding in ICT and internet connectivity, while 0.22% of the population

depends on commercial cyber cafés to pursue internet and typesetting text-based document. These discoveries mean that teachers working in public sector in Nairobi County have minimal self-efficacy with respect to combination of Information and Communication Technologies in their every day teaching. According to report from the Nairobi County Education Office, the sub Counties have integrated ICT as follows in primary schools; Langata 0.2% Starehe 0.1%, Kamkunji 0.10%, Embakasi 0.20%, Westlands 2.0%, Dagoretti 0.04%, Makadara 0.03 % ,. Kasarani 0.04%.

The percentage of the integration is basically low compared to other sectors   in Kenya despite the schools being supplied with the computers. The studies done by various researchers on the implementation of ICT found that most schools had not integrated ICT in teaching. Based on this background, there was need for this study to evaluate on the teacher factors effects on the integration of ICT in teaching specifically, on Pedagogical skills, Teachers 'Competency in ICT, Attitude and Gender into teaching processes in public primary schools in Nairobi-County, Kenya. Therefore, there was need to carry out this research to evaluate on the effect of the teacher factors on the integration of ICT into teaching and learning in public primary schools.

1.2 Statement of the Problem

Information communication technology (ICT) is seen as a catalyst for change in teaching styles, learning approaches and assessing information ICT has been identified in the whole world as a significant tool in schools for facilitating a new model of learner-centered education that supports learners' needs through differentiated and personalized instruction. Kenya's government has considerably invested significant resources in education transformation by supplying primary

schools with ICT amenities and training of teachers on ICT incorporation in the curriculum. In the year 2018, the ministry of Education Science and Technology provided computers to public primary schools in stages. There were 4,000 primary schools targeted nationwide for provision of ICT infrastructure. For successful ICT integration project, the Ministry of Education targeted approximately 300 Trainers of Trainers, and 150 ICT technical teams, to assist in maintenance of equipment during ICT training. At the end, 1,500 primary schools received ICT facilities this was done in all the counties including Nairobi with a total of 1,609 teachers being trained on ICT integration in teaching.

However, a report from the ministry of education on the integration of ICT revealed that only 5% of schools in the country have integrated ICT into teaching with Nairobi County having only 2.1% by 2018 which was a slow progress from the previous 0.17%. Despite the provision of ICT resources by the government to primary schools, teachers in Kenya continue using non- ICT based approaches in teaching various subjects, especially in Nairobi. Nairobi County being one of the largest counties with ICT based infrastructure, the integration of ICT was expected to be in most schools, however, the percentage of schools integrating ICT remains low. Several studies have been done in secondary schools on integration of ICT, but little is known about how Kenya primary schools have integrated ICT in their teaching specifically on the effectiveness of teacher factors.

In Nairobi county little is known by way of research as per the authors' knowledge on the ICT integration into teaching in public primary schools. It is not clear whether the primary teachers in the county are equipped with enough pedagogical skills, knowledge in application of ICT and learning resources for the integration of ICT into teaching. No study seems to have been carried out to evaluate on the teacher factors

like the ICT competency, pedagogical skills, attitude and gender, specifically in Nairobi County. Therefore, there was need for this study to evaluate on the teacher factors effect on the integration of ICT into teaching in public primary schools in Nairobi County, Kenya.

1.3 Purpose of the Study

The purpose of the study was to evaluate whether the teacher factors affect the integration of ICT into primary schools in Nairobi county, Kenya.

1.4 Objectives of the Study

The study was guided by the following objectives

i. To evaluate on the influence of teacher's demographic factors (age, gender and level of education) on the integration of ICT into teaching in public primary schools in Nairobi County.

ii. To evaluate the effect of teachers' pedagogical skills in the integration of Information Communication Technology into teaching in public primary schools in Nairobi County.

iii. To evaluate the effect of teachers' competence in ICT on integration into teaching in public primary schools in Nairobi County.

iv. To evaluate the effect of teachers' attitude on the integration of ICT into teaching in public primary school in Nairobi County.

v. To determine the relationship between teachers' gender and ICT integration in teaching in public primary school in Nairobi county.

1.5 Research Questions

The study was guided by the following research questions:

i. Does the teacher demographic factors affect the integration of ICT into teaching in public primary schools in Nairobi County?

ii. Does the Teacher's pedagogical skills affect the integration of Information Technology into Teaching in public primary schools in Nairobi County?

iii. Does teacher's competence in the utilization of ICT affect the integration of Information Communication Technology into teaching in public primary schools in Nairobi County?

iv. Does the Teacher's Attitude affect the Integration of ICT into Teaching in public primary school in Nairobi County?

v. Does teacher's Gender affect ICT Integration into Teaching in Public Primary Schools in Nairobi County?

1.6 Significance of the Study

The study was required to give a frame work to assist in the integration of ICT in teaching and curriculum delivery. The government officials in education ministry was expected to find the results beneficial in fast tracking and intervening on the teacher factors that influence the integration of ICT in public primary schools. The findings will aid Kenya to meet her goal in being an ICT compliant state by the year 2030, through effective allocation of resources

The findings of the study was expected to enlighten the government and. other interested party on the obstruction to the integration of ICT to facilitate teaching, the information would enable the government to identify mechanisms that was expected to ensure successful use of ICT to facilitate teaching in public primary schools.

The   Ministry of Education and department of Basic Education was expected to apply the findings   to come up with an in-service training program in ICT for the teachers, this will aid the integration of ICT learning in schools. The study findings aid the designing of better teaching methodologies and in identification of weaknesses in the curriculum as regards to ICT integration.

1.7 Limitations of the Study

i.   There were no prior studies thesis in Nairobi to provide the theoretical foundation for the research questions, However the researcher studies those which were relevant to the thesis from other areas

ii.   Limited access to some respondents which lead to rescheduling of the interview to virtual sessions to collect the data.

iii.   The information gathered on the availability of computer in comparison to the number of learners gave false information as some computers were obsolete. The researcher had to verify the computers to approve whether they were functional.

iv.   Respondents feared to disclose their strength and weaknesses in the ICT integration. This made researcher to assure them that, the information obtained was purely for academic research purposes and was treated with utmost confidentiality Following Limitations were underpinned in the Study

v.   Limitation of descriptive survey research design is that inappropriate wording and placement of questions within a questionnaire can bias the results. The questions must be worded and placed to unambiguously format to elicit the desired information / reconsolidation

1.8 Delimitations of the Study

The delimitations are the restrictions set by the researcher to mark the scope of the study (Cohen, Manion & Morrison, 2007). This study sought to evaluates the effect of teacher factors on ICT integration in teaching in public primary schools this was due to low percentage of ICT integration in primary schools despite government issuing of the laptops. There were other factors affecting integration of ICT into teaching in public primary schools' curriculum in Kenya. However, this study focused only on evaluation of the teacher factors on the integration of Information Technology into teaching in public primary schools in Nairobi County.

Nairobi County was chosen because of low percentage of schools implementing ICT in the public primary schools despite the provision of laptops. Nairobi County has 205 head teachers and 1567 teachers in the public primary schools. The study sampled 532 respondents to avoid conducting the study in the entire Nairobi County. The study was carried only in Nairobi County leaving the other counties in Kenya. the study did evaluation on the teacher factors such as the competence, pedagogical skills, knowledge and attitude towards the integration of ICT in teaching in primary schools. Therefore, this study focused only on the evaluation of teacher factors on the integration of Information Technology into teaching in public primary schools in Nairobi County.

1.9 Assumptions of the Study

The study was carried out on the following assumptions:

i.   That all teachers integrate ICT into teaching in public primary schools.

ii. That public primary school teacher in Nairobi is competent in application of ICT in teaching.

iii. That all public primary schools in Nairobi have ICT facilities.

iv. That both genders were represented in the population of teachers.

v. That the respondents answered the questionnaires truthfully.

1.10 Definition of Terms

The following are the Operational Definition of Terms used in the Study:

Adoption – Refers to the Act of Teachers' Integration of ICT in teaching in the Primary Schools.

Information Communication Technology – Refers to an umbrella term that includes any Communication Device or Application, Encompassing Laptops, Radio, Television**,** cellular Phones, Computer and Network hardware and Software Satellite systems and so on as well as the Various services and Applications associated with them such as Video Conferencing and Distance Learning. As applicable in integration of ICT in teaching .

Factors- Refers to Teacher Competence, Attitude, Gender and Pedagogical Skills on the Integration of ICT in School.

E-Learning- Refers to Learning supported by use of electronic technology aided by computer in teaching.

ICT Integration- Refers to the process of applying laptops and computers devices in to teaching in Primary Schools

Teacher Competency -Refers to Teachers being acquainted with knowledge and skills needed to integrate ICT into teaching.

Evaluation-Refers to the process that attempts to determine systematically and objectively as possible the relevance, effectiveness, and effect of teacher factors on ICT integration in teaching in public primary schools based upon established criteria, using the data gathered in assessment.

Attitude-Refers to teacher's beliefs and perception towards integration of ICT in teaching in public primary Schools.

Curriculum – Refers to a program of courses units covered through integration of ICT into teaching in particular learning activity area.

ICT Integration-- Refers to the use of ICT to introduce, Reinforce, Supplement and Extend Skills in ICT integration in to teaching in Primary Schools.

Competency- Refers to ability to Apply ICT Equipment and Integrate them effectively in Teaching

Gender-Refers to both Female and Male teachers   in the primary schools

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter reviewed the literature on global over view on the Influence of teacher factors under the following areas, pedagogical skills, teacher's knowledge on the use of ICT resources, teachers' attitude, and teacher's competence on the integration of Information Communication Technology into teaching, theoretical framework and conceptual framework are presented.

2.2 Information Communication Technology

Information communication technology is among the modern ways of information delivery in the world. In Kenya the government aims, at integrating use of ICT into education system, through integration of ICT into system. Teachers have to learn new strategies for delivery of instructions in classroom situation to aid the effective integration of the content in Kenya Rock (2010). In Malaysia, the government had come up with three strategies of implementing ICT into the education system. The first was that of ICT for each and every student meaning that ICT was used as an enabler to reduce the digital gap between the schools. The second strategy was to confirm the role and function of ICT in education as a teaching and learning tool, as part of a subject and as a subject by itself. The third policy emphasizes using ICT to increase productivity, efficiency, and effectiveness of the management system (Bates, 2010). This literature was reviewed on the teachers' factors on the   ICT integration into   public primary schools.

According to Mwololo (2010), the Ministry of Education in Kenya was committed to utilizing the following multi-prong strategies to ensure that the objectives of ICT in education are achieved and the preparation of sufficient and up-to-date tested ICT infrastructure and equipment to all educational institutions is put into place. The roll-out of ICT curriculum and assessment and emphasis on the integration of ICT in teaching and learning, upgrading of ICT knowledge and skills in students and teachers, increased use of ICT in educational and upgrading of the maintenance and management of ICT equipment in all educational institutions (Foong-Mae, 2010) which stated that in the near future, every student will have access to a 4G network in school through 1BestariNet which serves as a learning platform that is virtual, which can be used by teachers, students and parents to share learning resources, run interactive lessons and communicate virtually (Preliminary Report Malaysian Education Blue Print, 2012)this study looked at Malaysia situation, there was need to find out whether Kenya situation is similar to this findings. RoK (2010) proposed the principle objective of the ICT policy in Kenya so as to facilitate sustainable economic growth and development, and poverty eradication through productive and effective technologies. The policy also aims at pursuing progress towards the full socio-economic inclusion of citizens through universal access. Further, the policy was intended to stimulate investment in the ICT sector while at the same time encouraging the spirit of innovation through research and development Omwenga (2011). The strategies however did not lay down teacher factors which may influence the integration of ICT into teaching which this study evaluated on.

Kandiri (2010) observed that one of the most important ICT promoters and consumers through education, science and technology systems, public health, social plans and economic plans is the government. Different stakeholders, especially the private

sector, make inputs into the policy process which affect its outcomes. These include regulatory authorities, broadcasters, telecom operators, private network operators, service providers, content providers, software developers, vendors, education providers and ended state (ROK, 2010). Through the communication commission (CCK) of Kenya (2010), Parliament was required to enact legislation that provides for the establishment of a body, which shall be independent of control by government, political or commercial interests, and reflect the interests of all sections of society, set media standards and regulate and monitor compliance with those standards. This body is the Communications Commission of Kenya (CCK) Kozma (2008). Despite all these considerations, teacher competence has not been evaluated in Kenya especially in Nairobi which this study explored.

The National ICT Strategy for Education identifies the following strategic pillars for ICT implementation: establishment of an ICT framework; digital equipment; connectivity and net. In the context of globalization as an economic process, researchers identify a deterministic conception of ICT (Sawchuk, 2011; Shin & Harman, 2010 Tondeur, van Braak, & Valcke, 2010), However researchers describe a gap between rhetoric in government policy and reality of education practice (Cheng, 2009; Kozma, 2008; Selwyn, 2009; Tondeur (2011). The studies emphasize that without de-centralized supportive measures, national policies will not easily result in changes in instructional practices. Tondeur (2010) discuss the way forward as stressing the responsibilities of local educational institutions to translate the national ICT guidelines in an ICT plan as part of an overall school policy. Walker (2010) has also discussed three preconditions for a successful introduction of new information technologies into an education system. The strategy from the findings of Sessional paper NO 1of 2005 was based on the vision that 'ICT is a universal tool in Education

and Training however the studies ignored the strategies in teacher factors such as the pedagogical, competency and the teachers knowledge which needed to be evaluated on which this study explored..

The overall objective of the ICT plan is to ensure that systematic efforts are made towards strengthening adoption and use of ICT in the education sector with appropriate attention given to education development priorities as outlined in the Economic Recovery Strategy for Wealth and Employment Creation 2003-2007, Seasonal Paper No 1 of 2005 entitled 'A Policy Framework for Education, Training and Research' and the United Nations Millennium Development Goals (MDGs).The Ministry of Education developed a Kenya Education Sector Support program me (KESSP) in 2005 which featured ICT as one of the priority areas with the aim of mainstreaming ICT into the teaching and learning process. The studies, however, did not analyze teacher factors which could have effects on the integration of ICT which this study attempted to establish.

Like many other countries in the world, Kenya has developed National ICT Policy (2010). Which sets out the nation's aims, principles and strategies for the delivery of Information and Communications Technology to improve the livelihoods of Kenyans (MoE, 2011b) Ministry of Education introduced the National ICT Strategy for Education and Training (Farrell 2010). The ICT policy gives an opportunity for the establishment of grass root based on infrastructure for knowledge sharing (Mureithi and Munyua 2010) the study, however, has not elaborated on its findings.

The ICT in Education Options Paper (MOEST 2010), discusses the ways in which information and communications technologies (ICTs) can be leveraged to support and improve the delivery of quality education for all Kenyans Brake (SM 2011). It

provides a comprehensive range of potential technologies to improve teaching, learning, and management. It is intended to enable the government of Kenya (GOK) to plan appropriate ICTs in education interventions as they move forward with the comprehensive Kenya Education Sector Support programme 2005 –KESSP (UNESCO, 2005). This includes interactive radio instructions (IRI), use of computers in schools, development of ICT skills and the access to internet (Ayers, Odera, and Agak, 2010) according to OECD, {2010} The availability of trained teachers has been globally considered as a key strategy for advancement of the new technological innovation in the curriculum .There was need to evaluate on the teacher's knowledge in these areas influence on the integration of ICT in Kenya specifically in Nairobi county which the study did

Training teachers on ICT integration help to provide them with competencies and skills of how to incorporate ICT tools in their respective subjects in the classroom environment (Gaible, Bloome, Schwartz, Hoppes and Vota, 2011). Sahlberg (2010) noted that deficiency of teacher development programs in Finland influence integration of ICT in teaching and learning processes. In India, the use of Information and Communication Technologies is limited because of low numbers of adopters, especially among female teachers. The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Yusuf, 2005). ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Yusuf, 2005). In a rapidly changing world, basic education is essential for an individual to be able to access and apply information. Such ability must find include ICTs in the global village.

The integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult subject areas. To achieve these objectives, teachers need to be involved in collaborative projects and development of intervention change strategies, which would include teaching partnerships with ICT as a too Galba (2010). According to Zhao and Cziko (2011), three conditions are necessary for teachers to introduce ICT into their classrooms: teachers should believe in the effectiveness of technology, teachers should believe that the use of technology will not cause any disturbances, and finally, teachers should believe that they have control over technology. However, research studies show that most teachers do not make use of the potential of ICT to contribute to the quality of learning environments, although they value this potential quite significantly (Smeets, 2005). There was need to evaluate on teacher factors effect on the integration of ICT in teaching.

Harris (2002) conducted case studies in three primary and three secondary schools, which focused on innovative pedagogical practices involving ICT. Harris (2002) concludes that the benefits of ICT will be gained "…when confident teachers are willing to explore new opportunities for changing their classroom practices by using ICT. As a consequence, the use of ICT will not only enhance learning environments but also prepare next generation for future lives and careers (Wheeler, 2001). The changed pool of teachers will bring changed responsibilities and skill sets for future teaching involving high levels of ICT and the need for more facilitative than didactic teaching roles (Littlejohn et al., 2002).

According to Cabero (2010), the flexibilization time-space accounted for by the integration of ICT into teaching and learning processes contribute to increasing the interaction and reception of information. Such possibilities suggest changes in the

communication models and the teaching and learning methods used by teachers, giving way to new scenarios which favor both individual and collaborative learning". The use of ICT in educational settings, by itself, acts as a catalyst for change in this domain. ICTs by their very nature are tools that encourage and support independent learning. Students using ICTs for learning purposes become immersed in the process of learning and as more and more students use computers as information sources and cognitive tools.

Reeves and Jonassen, (2010) realized that the influence of the technology on supporting how students learn will continue to increase instructional sequences to achieve the desired learning outcome. Typically, these forms of teaching have revolved around the planned transmission of a body of knowledge followed by some forms of interaction with the content as a means to consolidate the knowledge acquisition. Contemporary learning theory is based on the notion that learning is an active process of constructing knowledge rather than acquiring knowledge and that instruction is the process by which this knowledge construction is supported rather than a process of knowledge transmission (Duffy & Cunningham, 2010). In this domain, learning is viewed as the construction of meaning rather than as the memorization of facts (Lebow, 2012; Jonassen & Reeves,1996). Learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resource-based, student centered settings and by enabling learning to be related to context and to practice the studies were not done in Kenya, there was need to evaluate on pedagogical system applied by teachers on ICT integration in teaching in Kenya specifically in Nairobi county. (Berge, 2011; Barron, 2010).

As mentioned previously, any use of ICT in learning settings can act to support various fields. .A report by OECD (2010) revealed that in Kenya, 19% of teachers were trained in ICT, while 18% of teachers were able to access and use ICT in their private and professional activities. This shows a very low number of teachers with ICT skills and potential to access ICT tools to prepare lessons based on the suitable integration of ICT. There was need to evaluate on whether the similar situation occurs in Kenya.

The literature review considers the influence of teachers' demographic factors effect on ICT integration in Teaching.Teacher demographics such as age, gender and level of education influence on integration of ICT in teaching. Most research outcomes from developed world have reported that there is much utilization of ICTs by the youth in comparison with the older generation; the older feel threatened by the new emerging technologies than the youthful generation. Makgato (2012) alludes that old teachers who are comfortable with the traditional method of teaching do not want new innovative means of teaching. They are fixed to the face to-face teaching and teacher cantered ways which provides them the sense of power and control in front of their students. Stahlberg (2010) argues that senior teachers trained in ICT incorporation develop their confidence to higher levels than colleagues coming to it lately, devoid of training in ICT incorporation.

UNESCO (2014) depicted that age influencees teachers' endorsement and use of the new technology in teaching. Young teachers in the age bracket of 25-30 years seem to have higher interest in integrating ICT to teaching (Chemwei & Koech 2014). Lentilalu (2015) in his study on teacher factors influencing integration of ICT in teaching in Samburu North Sub-County revealed that age of teachers has considerable

influence on ICT integration in teachingg there was need to determine whether the similar result could be attained in Nairobi.

2.3 Evaluation on effect of Teacher`s Pedagogical Skills in the Integration of ICT into Teaching

Al-Alwani (2011) and Pickersgill (2003) explored effective ways of utilizing ICT when teaching science. He found that the ease of Internet access allows teachers to help students to become experts; several International agencies are now focusing their attention on the issue of the digital divide (UNESCO, 2005). African Governments, non-governmental and corporate organizations have also started initiating projects dealing with the inclusion of ICT in the primary and secondary curriculum but not looking at teachers as a factor in the integration of ICT in primary schools' curriculum. Although countries are at the beginning of using new technology, its future use in education cannot be understood (Canoy & Rhoten, 2012).

This includes New Partnership for Africa Development (NEPAD) which focused on ICT for e-colleges as one of its projects. Norris (2001) observes that: For many years, the focus of this investment was on making successive waves of new technology work in resource- poor education environments. This emphasis tended to promote a techno centric approach to education reform, as these emphases were viewed as layering new technology on top of social problems at the college level but not in primary schools. The dominant view seemed to be that ICT itself would catalyze the much-needed changes in the education system.

Drent and Meelissen, (2011) conducted a study about factors which influence the innovative use of ICT by teacher educators in the Netherlands. A sample of 210 teachers was used for the study. Their study revealed that student–oriented

pedagogical approach, positive attitude towards computers, computer experience, and personal entrepreneurship of the teacher educator has a direct positive influence on the innovative use of ICT by the teacher. There was a need to find out which pedagogical skills are used by teachers. According to Brown (2011), the Hay study is likely to be flawed, but it does provide a set of general characteristics that were certainly associated with some effective teachers. However, the study failed to evaluate on the pedagogical skills of teacher on ICT integration, which the study established.

A study by Yildrim (2011) found that access to technological resources is one of the effective ways to teachers' pedagogical use of ICT in teaching.   Usluel, Asker and Bas (2011) indicated that in Turkey, majority of the respondents reported having access to computers and the internet. 82.5% and 81.2% of faculty members had access to computers and the internet respectively. However, this failed to evaluate on the actual situation in primary schools which this study intends to do. The technique applied was also not stated. This makes the findings of the study questionable.

Moseley, (2010), in a study of primary school teachers known to be achieved either average or above average gains on measures of relative attainment of pupils, focused on pedagogy using ICT, found a very complex picture in which it was difficult to characterize effective teachers using ICT. The teachers were supported in developing their practice in literacy and numeracy using ICT. The project explored links between teachers' thinking about their teaching behaviors or actions in the classroom and pupils 'learning gains. The work indicated that a key feature of the more effective teachers was their use of effective explanations. Observations showed that these teachers used examples and counter-examples and involved pupils in explaining and modeling to the class.

Teachers who favored ICT were likely to have well-developed ICT skills and to see ICT as an important tool for learning and instruction. They were also likely to value collaborative According to Castro Sánchez, and Alemán, (2011), many developed countries have had a 90 – 100% computer integration success rate; developing countries have had less success with the implementation of computers in their schools. For example in the United Kingdom, the government spending on educational ICT in (2011) in the UK was £2.5bn, in the United States, the expenditure on K-12 schools and higher education institutions was $6 billion and $4.7 billion respectively in 2009 and in New Zealand, the government spends over $ 410 million every year on schools ICT infrastructure Ajayi ,(2009) . Despite all these investments on ICT infrastructure, equipment, and professional development to improve education in many countries, Barolli, (2012) claimed that huge educational investment has produced little evidence of ICT adoption and use in teaching and learning especially in Turkey. Evidence suggests that education sector is investing heavily in ICT projects but the implementation of these educational ICT projects lagged behind than in the business sector Bingimlas, (2009) the study however did evaluate on teacher pedagogical skills factors which this study established.

The review by Watkins and Mortimer (2011) research into practitioners' views on pedagogy suggested that teachers recognized the complexity of pedagogy and the complex nature of classroom life. People have to access knowledge via ICT to keep pace with the latest developments. In 2011, the Government launched its second policy document on ICT in education, (A Blueprint for the Future of ICT in Irish Education). This was a three-year strategic plan designed to support the continuation of the main initiatives begun under IT 2000 and to build on the progress achieved under that plan. The main objectives of the Blueprint policy were to: to expand ICT

capital provision to schools, increase access to, and the use of, internet technologies, further integrate ICT in teaching and learning, enhance professional development opportunities for teachers (BECTA, 2009). Schools in the LDCs especially in Africa and those in their development phase have not been left behind as far as ICT in education is concerned. Bordbar (2010; 2011) points out that many developed countries have implemented ICT successfully into schools for teaching and learning, and argue that, owing to the cost of implementing ICT into education, However the study did not look into Pedagogical skills of teachers in integration of ICT, this study evaluated on Pedagogical skills of the teachers and reported the findings.

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ICT can be used to remove communication barriers such as that of space and time Lim and Chai, (2010) ICTs also allow for the creation of digital resources like digital libraries where the students, teachers, and professionals can access research material and course material from any place at any time (Cholin, 20010). Such facilities allow the networking of academics and researchers and hence sharing of scholarly material. This avoids duplication of work Cholin, (2010) ICT eliminating time barriers in education for learners as well as a teacher. It eliminates geographical barriers as

learners can log on from any place (Sanyal, (2011); Mooij, 2010, Cross, and Adam, 2010, UNESCO, 2010, Bhattacharya & Sharma (2007). ICT provides new educational approaches Sanyal, (2011). It can provide speedy dissemination of education to targets advantaged group (UNESCO, 2002) Chandra and Patkar, (2007).ICT enhances the international dimension of educational services UNESCO,(2002). It can also be used for non-formal education like health campaigns and literacy campaigns (UNESCO, 2002). Use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real world problems. There was need to establish whether this is applicable in Kenya.

Lim and Hang, (2010) it improves the perception and understanding of the world of the student. Thus, ICT can be used to prepare the workforce for the information society and the new global economy Kozma, (2011). Plomp et al (2010) state that the experience of many teachers, who are early innovators, is that the use of ICT is motivating for the students as well as for the teachers themselves.

Bottino (2010) and Sharma (2010) mention that the use of ICT can improve performance, teaching, administration, and develop relevant skills in the disadvantaged communities. It also improves the quality of education by facilitating learning by doing, real time conversation, delayed time conversation, directed instruction, self-learning, problem-solving, information seeking and analysis, and critical thinking, as well as the ability to communicate, collaborate, and learn (Yuen et al, 2003). A great deal of research has proven the benefits to the quality of education Al-Ansari (2006). Hepp, Hinostroza, Laval, and Rehbein (2011) stated that the literature contains many unsubstantiated claims about the revolutionary potential of ICTs to improve the quality of education. They also note that some claims are now

deferred to a near future when hardware will be presumably more affordable and software will become available.

Watkins and Mortimer (2011) identified some tensions between the review of pedagogy in the academic and research literature and the views of practitioners. In particular, while the trend among researchers and academics has been towards a model that supports the active construction of meaning and endeavors to help learners learn about learning, there was need for, teachers to adopt a simplified model of practice in the face of contextual constraints to implement ICT. Survey methods for measuring pedagogical knowledge are being developed. However, little has been done in Kenya, where a lot of knowledge in ICT is still needed for the integration of ICT into teaching, and the fact that much still needs to be learned about its nature makes this study relevant has it looks into pedagogical as a factor that could influence the teachers integration of ICT into teaching which the study has looked into.

Rowanet (2011) in his studies examined specific aspects of teachers 'detailed knowledge of learners and their misconceptions require careful investigation of pupils' learning compared with teachers' predictions of their difficulties and misconceptions, however, did not look at the teacher's factors which could affect integration. In Hadley & Rheingold's (2010) report, segmentation analysis was used to assess if there were common responses that identified subgroups in the sample. This analysis indicated that there were five main segments or types of teachers and circumstances in this sample, including 'enthusiastic beginners', 'supported integrated', 'high school naturals', 'unsupported achievers' and 'struggling aspirers' Dion P D(2010). These subgroups diverged on the following factors: (a) experience and comfort with technology; (b) grade level taught; (c) applications and practices they use, and (d) extent of support/colleagues at school. This analysis indicates that

not all 'accomplished' technology-using, teachers possess similar qualities, but that adverse and complex combinations of factors have had an impact on their path to success The study looked at the detailed knowledge of the learners and their misconception on ICT, however did not evaluate on the teacher factors influence on the integration of ICT in classroom which this study was intended to establish.

Becker and Riel (2011) is a recent study on constructivist classrooms that examined the relationships between professional engagement and teaching practice, including instruction involving computer use. The professional engagement was measured by the frequency that a teacher had informal substantive communications with other teachers at their school, the frequency, and breadth of professional interactions with teachers at other schools and the breadth of involvement in specific peer leadership activities, workshop and conference presentations. The study found that teachers who regularly participate in professional interactions and activities beyond their classroom teaching in different ways than teachers who have minimal contact with their peers or profession.

The more extensively involved teachers were in professional activities, the more likely they were to have teaching philosophies compatible with constructivist learning theory, teach in ways consistent with a constructivist philosophy and use computers more and in exemplary ways. Their use of e design and development of learning environments (Collins, 2010observed that Learning environments need to reflect the potential uses of knowledge that pupils are expected to master, in order to prevent the acquired knowledge from becoming inert (Bransford, Sherwood, Hasselbring, Kinzer, & Williams, 2011 and Duffy & Knuth, 1990). In addition, teachers should encourage pupils to engage in active knowledge construction. This calls for open-ended learning environments instead of learning environments which focus on a mere transmission of

(Collins, 2011; Hannafin, Hall, Land, & Hill, (1994); Jonassen, Peck, &Wilson,(2011). ICT may contribute to creating powerful learning environments in numerous ways.

ICT in education field provides opportunities to access an abundance of information using multiple information resources and viewing information from multiple perspectives, thus fostering the authenticity of learning environments Enter, P.A (2010). ICT may also make complex processes easier to understand through simulations that, again, contribute to authentic learning environments. Thus, ICT may function as a facilitator of active learning and higher-order thinking (Alexander, 2010Jonassen, 1999). The use of ICT may foster cooperative learning and reflection about the content.

Usman, (2010) stated that, ICT may serve as a tool to curriculum differentiation, providing opportunities for adapting the learning content and tasks to the needs and capabilities of each individual pupil and by providing tailored feedback (Mooij,2011 Smeets & Mooij (2011). As Stoddart and Niederhauser (1993) point out, ICT may fit into a spectrum of instructional approaches, varying from traditional to innovative. Another aspect which may, of course, influence the use of ICT is access to technology (Kennewell, Parkinson, &Tanner, (2011) OTA, (2010). This refers not only to the number of computers but also to the placement of the equipment, e.g. in the classroom or in a computer room.

Kennewell (2010) felt it is essential that computers be placed in the classroom to maximize the opportunities for curriculum activity. He noted that ICT environment improves the experience of the students and teachers and to use intensively the learning time for better results. The ICT environment has been developed by using

different software and also the extended experience in developing web based and multimedia materials. ICT has an important role to play in changing and modernizing educational systems and ways of learning computers with students were not limited to gaining computer competence, but extended to the involvement of teachers hence need to evaluate on the pedagogical issues which might influence teachers' integration which this study evaluated.

Integrated Learning Systems would, for example, fit into his Surrogacy stage and also be an example of Bruner's second model. Research on ILS indicates that the role of the teacher is crucial to its success (McFarlane, 2010). There has been extensive research into collaborative and cooperative learning with ICT (for example, Hoyles 2011) in which groups of learners solves problems or carry out learning tasks with the aid of a computer. This research is based on constructivist theories of learning, much as described in Bruner's third model. Olson (2011) developed the idea that the computer offers teachers ways to enhance what and how they teach, but at the same time threatens those very practices by calling them into question. The very presence of the computer says something about what the teacher values. For instance, it symbolizes the teacher's interest in modern trends and her capacity to cope with the latest teaching technologies. However, the computer also threatens illusions which teachers have about what they are doing. (Solomon, 2010; Watson, 2010).

Some think computers make better teachers; others imagine that computers help teachers do what they do better. Olson (2010) further added that teachers act to protect their influence over core elements of their work, such as covering the curriculum and maintaining their credibility. However, these protective strategies for maintaining classroom influence may erode the potential of computer-based teaching. Achieving the full benefits of computers in the classroom may require the teacher

under observation to tolerate more ambiguity, to increase individual attention, and to engage students in divergent thinking.

All of these created risks. These risks are managed, but over protection of these core elements may set a limit to reform of the curriculum through computer-based teaching unless teachers and software designers look critically at the way teachers exercise influence in the classroom. Cuban's (1993) work referred to earlier is a testament to this risk management.

Palak and Walls (2009) conducted a mixed study to investigate whether teachers who frequently integrate technology and work at technology-rich schools shift their beliefs and practices toward student-centered paradigm. The results showed that their practices did not change; neither student-centered nor teacher-centered beliefs are powerful predictors of practices. However, teachers' attitudes toward technology significantly predict teacher and student technology use, as well as the use of a variety of instructional strategies. Sang (2010) focused on the impact of Chinese student teachers' gender, constructivist teaching beliefs, teaching self-efficacy, computer self-efficacy, and computer attitudes on their prospective ICT use. The findings confirmed the results of the study by Palak and Walls (2009) that the strongest predictor of future ICT use were teachers' attitudes toward it. In addition to the influence of teacher attitudes, Sang (2010) indicated that pre-service teachers with highly constructivist teaching beliefs have stronger intentions to integrate technology into their future teaching practices.

Furthermore, more Scrimshaw (1997) noted that confident pre-service teachers were more capable of and interested in using computers in real classrooms. Thus, although teachers' attitudes towards ICT use were found to be the strongest predictor of

technologic in Education integration, the impact of their beliefs and confidence in using ICT should not be disregarded either. Internal variables can partially explain the success of technology integration in the classroom. However, the influence of these variables may change after participation in technology preparation courses or programs. There was also need to evaluate the effect of pedagogical skills in Kenya and to confirm whether teachers' pedagogical skills in ICT integration in teaching are adequate.

Abbott and Faris (2011) examined pre-service teachers 'attitudes toward the use of computers before and after a semester-long technology literacy course. The results showed that positive attitudes toward computers increased after the course because of the instructional approaches, meaningful assignments requiring technology, and supportive faculty. Thus, the authors claimed that teacher education programs should teach pre service teachers not only on how to use hardware and software, but also how to incorporate computers into their teaching strategies and activities. The authors also noted that small groups and collaborative learning are the most appropriate when introducing new hardware and software because more advanced and experienced teachers can assist those who need more technology learning support. Another similar study was conducted by Doe ring.

Hughes, and Huffman (2010), who analyzed pre-service teachers' perspectives regarding ICT in their future classrooms before and after participation in a teacher preparation program. Prior to taking the preparation courses, teachers were doubtful about the utility of ICT in the classroom, implying that they would closely examine and consider technology integration, rather than blindly incorporate it into their teaching practices. After completing the courses, their doubt had transformed into more positive sentiments. The teachers had a better understanding of ICT use in the

classroom. Although the teachers confronted other issues such as technology availability, accessibility, professional support, and classroom management, their perceptions about technology's role had changed. They were more likely to believe that technology can assist in learning and to recognize its importance.

Serhan (2009) and Chai, Koh, and Tsai (2010) also investigated pre-service teachers' beliefs about the use of computer technology and the effectiveness of ICT courses. The results of both studies indicate that after participating in courses, pre-service teachers recognized the importance of technology integration into their curricula and believed that ICT use would enhance student learning. They felt that such courses prepared them to apply ICT in the future, and their abilities to select, evaluate, and use a variety of technological resources improved.

More specifically, Chai, Koh, and Tsai (2010) found that ICT courses with direct instruction on the use of technological tools through the technology enhanced lesson approach helped teachers learn how to use technologies as supporting tools in order to enhance their teaching and student learning. Consequently, the pre-service teachers viewed the preparation course favorably. It was found worth exploring how the ICT preparation courses or programs change teachers' intentions and actions. Choy, Wong, and Gao (2009) conducted a mixed study to examine the intentions of pre-service teachers before and after a technology preparation course. Their intentions were then compared with their actions related to technology integration during their teaching. Despite the study's attempt to explore the benefits of ICT to teachers, it did not look into ICT to the aspect of actual teaching to learners which this study did.

Hughes and Huffman (2003), noted that the their intentions of the teachers became significantly more positive as a result of increased pedagogical Knowledge.

Nevertheless, these teachers were not able to translate the positive intentions into actual teaching, largely due to unfamiliar school environments. Based on these results, Choy, Wong and Gao (2009) concluded that teacher education programs need to increase awareness of the benefits of integrating technology into student-centered learning approaches, and provide pedagogical knowledge related to student-centered learning as well as technology integration strategies. There was need to evaluate on the teacher pedagogical skills in Kenya to find out whether the situation is similar, which this study did.

Hadjidemetriou and Williams (2011) proposed a methodology that sought to bridge the gap between pupils' difficulties and teachers 'perceptions of these difficulties in using ICT. In the study the aim was to determine an appropriate diagnostic assessment instrument to elicit pupils 'misconceptions of graphing. The study used a questionnaire to assess the perceptions of the teachers on the use of ICT. Many of the studies reviewed sought to consider a wide range of effects on the learners and have not involved teachers' professional development, which this study sought to establish.

Some reports yield disappointing results. For example, Jevis, (2010) evaluated the effect of collaboration via email on the quality of 10- to 11-year-old pupils' investigative skills in science in six rural primary schools. They found no real indications that the use of email enhanced learning in science. In this instance, the study encountered problems with hardware, software and the teachers' abilities. Studies focused on specific aspects of pedagogy. In a meta-analysis of many focused studies, Clements (2010) described the unique contribution of computers to the problem- and project-oriented pedagogical approaches. His research showed that pupils' collaborative activities resulted in enhanced achievement. An increase in pupils 'collaboration resulted in 'deep conception', and the pupils seeing learning as

dependent on thinking on understanding. Control groups possessed 'shallow 'conceptions of learning, seeing it as a matter of paying attention, doing assigned work, and memorizing However failed to evaluate on pedagogical aspects.

These results could be independent of ICT uses since the effectiveness of computer software is likely to be dependent on the pedagogical context within which it is used (Hoyles, 2001). Another convincing experiment, but with a very small sample was done (McFarlane, 2010), introduced line graphs to 8-year-old children, using data logging. Children who had been exposed to data logging showed an increased interest ability to read, interpret and sketch line graphs working, inquiry and decision making by pupils.

Michel (2010) suggested that allowing pupils to make video clips can develop their powers of observation and open new perspectives for their understanding of scientific concepts. This is because pupils need to think about exactly what should be recorded in order to explain a concept. This type of inquiry-based teaching involves pupils in deciding which problems to investigate, searching for alternative solutions, collecting and tabulating data, reporting conclusions, and suggesting new related problems for further investigation. The technology also gives teachers the flexibility to demonstrate scientific concepts through a method other than a live demonstration. In one example from this study, a high school biology teacher produced a CD-ROM of short clips digitized from tapes made by pupils during a long-term experiment to grow various plants. The pupils later incorporated the clips into scientific presentations. Reid (2002), in an evaluation of a pilot study of digital video in 50 schools in the UK, reported that teachers found that filming and editing a video about forces helped pupils to assimilate scientific concepts more effectively, quickly and substantially than would have been achieved with handouts or textbooks on the above-reviewed

studies none of them came out of clear pedagogical strategies which could be used in implementation of ICT.

Barton (2010), in a review of research on data logging, concluded that the main benefit is the time saving, but suggested that the important factors of interaction with peers and intervention by the teacher need further research. Linn and (2011) found that pupils are much better at Palak and Walls (2009) conducted a mixed study to investigate whether teachers who frequently integrate technology and work at technology-rich schools shift their beliefs and practices toward a student-centered paradigm. The results showed that their practices did not change; neither student-centered nor teacher-centered beliefs are powerful predictors of practices. However, teachers' attitudes toward technology significantly predicted teacher and student technology use, as well as the use of a variety of instructional strategies.

Sang (2010) focused on the impact of Chinese student teachers' gender, constructivist teaching beliefs, teaching self-efficacy, computer self-efficacy, and computer attitudes on their prospective ICT use. The findings confirmed the results of the study by Palak and Walls (2009) that the strongest predictor of future ICT use were teachers' attitudes toward it. In addition to the influence of teacher attitudes, Sang et al. (2010) further indicated that pre service teachers with highly constructivist teaching beliefs have stronger intentions to integrate technology into their future teaching practices. Furthermore, more confident pre-service teachers were more capable of and interested in using computers in real classrooms. Thus, teachers' attitudes towards ICT use were found to be the strongest predictor of technology in Education.

Keriga and Buria (2011) study found out that acquisition of practical skills had been undermined by inadequate facilities. This had particularly affected the adoption of

ICT curriculum whose instruction requires a practical approach. The curriculum revision in 2010 envisaged that learners would be equipped with competencies to operate effectively in a knowledge-based economy. The achievement of this objective was hampered by lack of effectiveness of ICT integration. Despite the fact that the process of ICT access and integration is a combination and coordination of separate and diverse elements to a more complete or harmonious whole, ICT access and integration process in primary schools are still far from complete (Nyamboga, Ong'ondo and Ongus, 2010).It is in this context that this study sets out to investigate on the pedagogical skills applied by teachers factors on the integration of Information Communication Technology in the school curriculum in public primary schools in Nairobi County.

The ICT Test Bed evaluation Underwood (2016) provides evidence that many teachers use ICT to support innovative pedagogy. It states, "New technologies that provide a good fit with existing practices, such as interactive whiteboards are first to be embedded, but others like video conferencing, digital video and virtual learning environments are now being incorporated, providing evidence of ongoing learning by the workforce. Training needs to continue to support innovative pedagogy." Both examples show that ICT is being integrated into a continuous process.

This, therefore, ICT can improve teaching by enhancing an already practiced knowledge and introducing new ways of teaching and learning. Transforming teaching is more difficult to achieve. Underwood (2016) "Changes that take full advantage of ICT will only happen slowly over time, and only if teachers continue to experiment with new approaches." This evaluation came from a teacher training seminar in IT during the ITMF project. It showed that teachers have not fully changed their use of ICT in education; however, most of them changed their way of thinking

about the application of ICT in education. Teachers have increased their use of ICT in lessons where students look for information on the net and use it afterward for subject specific areas, but hardly any use of ICT for class presentations.

Nonetheless, teachers do not make use of ICT to engage students more actively to produce knowledge. Similarly, the e-learning Nordic study shows an increase in the use of ICT to teach but not to innovate teaching methods: "ICT generally has a positive impact on teaching and learning situations, but compared with the ideal expectations; the impact of ICT on teaching and learning must still be considered to +be limited" Ramboll (2011) . Many teachers use ICT to support traditional learning methods, for example, information retrieval in which students are 'passive learners of knowledge instead of 'active producers able to take part in the learning process

In a document entitled teaching and learning with ICT, G. Galea (2010) explains how ICT can promote teaching and learning. According to her, there are two main reasons behind increasing the use of ICT in education in the UK. Firstly, ICT can change the lessons' pace: she stated that children in modern society need to develop sufficient potentials and skills that enable them to take full advantage of the new opportunities that ICT offers. Second, there are groundswells of interest of academic researchers in the UK in how technological tools can enhance the quality of teaching and learn in schools, and so help learners to achieve better outcomes. Furthermore, it has been proved that new technologies have lots of benefits for the students.

According to Ofsted (2010), ICT allows for higher quality lessons through collaboration with teachers in planning and preparing resources. Students learn new skills: analytical, including improvements in reading comprehension Lewin et al., (2010) ICT also develop some writing skills: spelling, grammar, punctuation, editing

and re-drafting (Lewin et al., (2000) Still new technologies encourage independent and active learning, and students' responsibility for their own learning Passey (2011) ICT proves that students who used educational technology felt more successful in school they are more motivated to learn more and have increased self- confidence and self-esteem. It has also confirmed that many students found learning in a technology-enhanced setting more stimulating and much better than in a traditional classroom environment (Pedretti & Mayer-Smith 1998). There is need to establish whether the teacher in Kenya still practice

From a research conducted by Blanskat, Blamire and Kefala, (2006) it is clear that schools with sufficient ICT resources achieved better results than those that are not well-equipped and that there are a lot of benefits in using ICT in education both to a teacher and to the pupils. He did not research on the challenges faced in implementation of ICT but concentrated on the advantages of ICT and its benefits in Education. There is a need for planning and communication to help ensure a successful implementation. In this column, we looked at the actual work typically performed in a complex implementation. However, your implementation may not be as complex, and you may not need to look at all of these areas. Nevertheless, there is usually a lot more involved than just throwing the final solution into the implementation environment. You need to account for the environment the solution will run in, as well as processes and training needs of the client community, depending on the pedagogical skills.

According to Lee, (2004), a successful implementation of any new system goes through the following stages: Prepare the infrastructure. Many solutions are implemented into a production environment that is separate and distinct from where the solution was developed and tested. It is important that the characteristics of the

production environment be accounted for. This strategy includes a review of hardware, software, communications, etc. In our example above, the potential desktop capacity problem would have been revealed if we had done an evaluation of the production (or real-world) environment. When you are ready for implementation, the production infrastructure needs to be in place. Coordinate with the organizations involved in implementation. This may be as simple as communicating to your client community. However, few solutions today can be integrated without involving a number of organizations. For ICT solutions, there are usually one or more operations and infrastructure groups that need to be ignored which this study intends to do.

A research carried out by Blanskat, Blamire and Kefala (2014) established that schools with enough ICT resources attained better results than those which are under-equipped and that there are a lot of advantages in using ICT in education both teachers and pupils. He did not examine the difficulties encountered in integration of ICT but based on the advantages of ICT and its benefits in Education. There is a need for planning and communication to help guarantee a successful execution. In this column, I looked at the actual work typically performed in a complex implementation. However, there is usually a lot more involved than just jumping to the final solution into the implementation environment. You need to account for the environment the solution will run in, as well as processes and training needs of the client community. If you think through the implementation of a holistic tactic and communicate well, there is a much greater possibility that your project will end as a win. Tedler,(2012) Noted that a lot of these activities need to be completed ahead of time. You cannot begin planning for implementation while you are actually implementing. According to Lee, (2004) a successful integration of substantial evidence that ICT is a fundamental part of the global society and its value in schools is to assist in knowledge creation,

knowledge sharing, problem-solving, communication, group and cooperative learning, the development of an economic and social change.

Tedla, (2012) states that new technologies have the possibility to enhance and to transform teaching and learning processes. He additionally emphasizes that ICTs also provides effective teaching-learning atmospheres by providing opportunities for effective communication between teachers and learners. These new technologies also help learners to develop knowledge and skills, cooperation, communication, and problem-solving. This is approved by Tay, Lim, Lim and Ling Koh, (2012) who established that with ICT, the primary school teachers had the ability to use various of pedagogical approaches which included transmissive, dialogic, constructionist approaches to enable learners in their English class to make their own digital stories, take part in dialogues and exchanges through the comments poste in discussion blogs.

Tay et al (2012) also found out that the use of drill and practice in mathematics enabled learners to master basic computational and arithmetic skills and the instant response worked as a motivational source for more engagement in the learning activities. The authors coincide with the findings of these researchers since in our modern times, ICT is ubiquitous in all spheres of life and forms part of the youth's culture. Various ICTs are used for entertainment, social communication, searching, transmitting and sharing knowledge. Siemens Computer and cell phone games help in developing those desired skills such as problem-solving, which are expected to be mastered by learners. The study however did not show the theory and the sample procedures making the outcomes questionable. Therefore, this is indicative that when ICT is used properly by passionate and astute teachers, learners with different learning styles and specific needs can be assisted to accomplish their learning and to master the subject matter at their own pace. Over and above, ICT is also indispensable

in teaching and learning as they provide access to information and provide learning past the classroom.

Castells, (2010) adds that learners should use new ICT to access knowledge in order to be powerful as knowledge is equated with power. The use of the internet by learners, for example, can be a source of reference and a means of communication with peers and the experts. In underdeveloped and developing countries, ICT offers unprecedented opportunities to promote and enhance educational systems and reduce the sense of isolation thereby providing access to knowledge in ways that were unknown before many researchers, who affiliate to the information society paradigm, agree that the climax of ICT usage in education is their potential to create the self-programmable force for the workplace in order to be able to compete at a global level with anyone, anywhere and at any time however the study did not look at the influence of teacher factors in integration of ICT which this study established (Aktaruzmannet al, 2011; Castells, 2010)

It is, therefore, imperative that teachers employ ICT to be able to teach digital children and acquire new ways of teaching and learning which are considered to be relevant in the modern era which is powered by the use of new technologies. The benefits of ICT usage in the preceding paragraph are indicative of why some teachers integrate ICT across the curricula. The advocates of ICT in education (Eze and Olusola,(2013); Castells,(2000) assert that ICT in the classroom is essential for the provision of opportunities to enable learners to operate in the information society since the traditional methods of teaching do not prepare the learners to be productive.

Today's teachers also face a challenge of teaching 'the Net Generation' which actually come to class equipped with multimodal skills who are constantly in touch,

motivated beyond responding to the ever-changing worlds. These learners have the ability to use any technology they come across according to Olusola (2013), Teachers, therefore, have to change their attitudes and beliefs as far as the teaching activities are concerned and adopt technology in order to perform the pedagogic activities with ease and confidence. Research studies (Eze & Olusola, 2013) also reveal that teachers use ICT to expand pedagogical resources available and to facilitate knowledge sharing with fellow teachers. As much as ICT help learners in completing their educational tasks, ICT also give teachers an opportunity to help learners with particular needs.

Tedla, (2012) and Tay (2012) confirmed that teachers use ICT tools in order to make the lessons more interesting and engage learners according to learners' potentials. The exposure in utilizing various digital tools also encourages learners to reinforce the learned material using the individual learning styles. Over and above this, it is beneficial to learners from digitally poor backgrounds as they are provided with the opportunity of being included in the use of ICTs for knowledge sharing and in making the world flat by enabling global communication with anyone, anytime and anywhere.

According to Hennessy, Harrison and Wamakote (2010), most Nigerian teachers who use new technology in teaching and learning, expressed the view that ICT is very useful and also stated that ICT make teaching and learning easier. In other underdeveloped and developing countries, the use of ICT is considered as a foreign idea and borrowed policies. These borrowed ICT ideas are adapted and integrated into their policies to work successfully but in many instances are found to be impractical and are bound to fail. This failure is due to the fact that many African states do not have funds to sustain the use of ICTs in their schools. In the Sub Saharan region where ICT use in teaching and learnings deemed important, the integration is not fully utilized as expected and experienced in the well-developed countries.

According to Makgato(2012) teachers do not use ICTs due to the fact that they are afraid of new innovations and change and are technophobic despite the availability of ICTs in their schools. In many instances, lack of technical skills is another contributor in non-use of ICT in teaching and learning. Some teachers shun ICT and continue to use traditional methods of teaching and learning and as such limit the use and importance of ICT. Research has proven that teachers are key figures for the successful integration of ICT in teaching and learning and are also agents of change. The use of ICT is to a large extent dependent on them. However, Eze and Olusola (2013) reiterated that the role of the teacher is changing as ICT are inventing new roles for teachers. They further assert that through ICT some resources such as overhead projectors and chalkboards are becoming redundant and obsolete when learners have access to the same networked resource on which the teacher is presenting the information. Teachers' role of transmitting knowledge is also seen as being replaced by encouraging learners to construct their own knowledge, engage in problem-solving activities, develop critical thinking skills, use the internet to search and select the required information and foster collaborative work for peer teaching, knowledge sharing and social interaction.

The availability of trained teachers has been globally considered as a key strategy for the advancement of the new technological innovation in the curriculum OECD, (2004). Training teachers on ICT integration help to provide them with competencies and skills of how to incorporate ICT tools in their respective subjects in the classroom environment (Gaible, Bloome, Schwartz, Hoppes & Vota, 2011). Sahlberg (2010) noted that deficiency of teacher development programs in Finland influence integration of ICT in teaching and learning processes. In India, the use of Information and Communication Technologies (ICTs) is limited because of a low number of

adopters, especially among female teachers. A report by OECD, (2014) revealed that 19% of teachers were trained in ICT, while 18% of teachers were able to access and use ICT in their private and professional activities. This shows a very low number of teachers with ICT skills and potential to access ICT tools to prepare lessons based on suitable application soft wares (Rastogi and Malhotra, 20130.however the study was done outside Nairobi county, there is need to do evaluation in Nairobi to establish whether the results are similar, which this study did, (Door gaper sad, 2014).

According to the Global Campaign for Education (2012), it was noted that an absence of women teachers accessing and using the new technologies in secondary school was worsened by a challenge of inadequate training of female teachers. One of the challenges facing ICT integration initiative has been related to inadequate teachers trained in ICT integration in pedagogy. In an article published in Exhibitor Magazine (2014), Munene Henry affirms that teacher development programs are necessary to overcome one of the challenges facing ICT integration initiative has been related to inadequate teachers trained in ICT integration in pedagogy. In an article published in Exhibitor Magazine, (2014), Munene Henry affirms that teacher development programs are necessary to overcome any kind of resistance. The teacher development programs in Finland indicated that about 63% of teachers neither have ICT skills nor access and use computers (Norrag, 2013). In a study conducted in West Africa, Vyas-Doorgapersad (2014) found that training of teachers in the new technology was hampered mainly by inadequate ICT skills and facilities. The MOEST trains teachers of Mathematics and Sciences ICT integration under CEMASTEA programs. However, little is known on the training on pedagogical skills in other subjects in primary schools which the study evaluated on specifically in Nairobi County.

The training was meant to be part of teacher motivation and induction for adequate preparation to integrate ICT in the curriculum. Through in-service training, teachers gain technological experience and knowledge through lessons that the availability of trained teachers has been globally considered as a key strategy for the advancement of the new technological innovation in the curriculum (OECD, 2004). As earlier noted by Gaible, Bloome, Schwartz, Hoppes and Vota,(2011) that the level of competency of the teachers in the use of ICT was so limited and this made it very difficult to incorporate ICT tools in the teaching of specific subjects by the teachers. In India, the use of Information and Communication Technologies (ICTs) is limited because of a low number of adopters, especially among female teachers.

A report by OECD, (2014) revealed that 19% of teachers were trained in ICT, while 18% of teachers were able to access and use ICT in their private and professional activities. This shows a very low number of teachers with ICT skills and potential to access ICT tools to prepare lessons based on suitable application software Rastogi and Malhotra, 2013; Vyas-12 Doorgapersad, 2014). The Global Campaign for Education (2012) noted that an absence of women teachers accessing and using the new technologies in secondary school was worsened by a challenge of inadequate training of female teachers, demands of the 21st century (Norrag, (2013); United Nations,(2014); Vyas-Doorgapersad, (2014).

Shazia (2011) further suggested that training teachers to serve as technology experts could support the integration of technologies into the classroom practices. In another instance, Semenow (2005) posited that acquirement of ICT facilities had created a great challenge to teachers due to the cost of electronic machines such as computers, digital cameras, and projectors. As a result, the Government of Kenya had visualized to setting up a Universal Service Fund (USF) for ICT sector to subsidize the cost and

to ease access of ICT infrastructure rollout in underdeveloped regions. The USF for ICT was also established to train human resources, teachers included, in the technology (Kenya National ICT Policy, 2006). Finally, Shazia (2011) had provided an explanation that ICT integration training enables teachers to match what subject content and pedagogy with suitable application software related literature reviewed depicted that age affects teachers" effective adoption and use of the new technology in teaching and learning (UNESCO, 2014). Chemwei &Koech, (2014) found that young teachers in the age bracket of 25-30 years seem to have a higher interest in ICT. The young teachers show a great of enthusiasm in the adoption and use of computers in their private and in public life. The older generation of teachers, therefore, experienced challenges when using ICT in teaching-learning (Guoyuan, 2010).

Salhberg, (2010) argued that senior Finnish teachers trained in ICT integration develops their confidence to higher levels than colleagues coming to it more recently, 14 without training in ICT integration. In Cyprus, teachers who began using computers at the ages of 40"s or 50"s face great difficulty to understand computer language or computing commands. Kusano, Frederiksen, LeAnne, and Kobayashi (2013) found that age determined teachers" usage of ICT in teaching and learning. This attested that teacher's age influences the use of ICT integration in classroom practices (Kurga, 2014). Peeraer and Petegem (2011) confirmed that the age of a teacher can influence utilization of ICT in teaching among teachers particularly those who were either born in the world of technologies or late adopters who accessed technologies.

One of the challenges facing ICT integration initiative has been related to inadequate teachers trained in ICT integration in pedagogy. In an article published in Exhibitor

Magazine, (2014), Munene Henry affirms that teacher development programs are necessary to of Researchers have also found that computers enhance teaching and learning by providing opportunities to practice and to analyze, offering better access to relevant articles and teaching and learning materials. Every classroom teacher should use learning technologies to enhance their students' learning in every subject - because ICT can engage the thinking, decision making, and problem-solving and reasoning behaviors of students (Grabe&Grabe, 2001).

In fact, innovative use of ICT can facilitate student-centered learning (Drent, 2005), engage students in constructivist classrooms and enhance their social interaction (Dodge, Colker, &Heroman, 2003). It has been shown to improve their cognitive development (Nir-Gal & Klein, 2004), increase creativity (O'Hara,2008), and improve their problem-solving skills (Sarama& Clements, 2001).The International Society for Technology in Educational (ISTE) emphasizes that teachers of today should prepare to provide technology-based learning opportunities for their students (Hamidi, Meshkat et al.(2011). ICT use has increased dramatically over the last few years. In the developed regions, the percentage remains much higher than in the developing.

The World (MDG Report 2010) stated that on the other hand, adoption and usage of ICT are not limited to the developed nations, and a number of developing nations have adopted technology in their educational systems (Ihmeideh, 2010). The Minister of Higher Education in Lebanon, for example, in 2007, announced the allocation of 400 computers for public schools, linked to the Web through broadband1 (Nasser, 2011). Wim's and Lawler, (2011s), in Kenya, established substantial advantages to students from exposure to ICT after studying the effect of ICT projects in educational institutions. Downloading a web page are noticeably quicker (can be up to 50 times

faster than dial-up access) since broadband is swift Internet access. Fixed Broadband is the fastest Internet access that has a high rate of data transmission. Two common means to acquire fixed broadband Internet access are with a cable modem made available by a cable company, or a digital subscriber line (DSL) made available by a telephone company Savage, S. J. and D. Waldman, (2011). "Broadband Internet access, awareness, and use Analysis of United States household data." Telecommunications Policy 29(8): Mobile broadband is a variety of wireless Internet access whereby data is transferring through the cellular carriers to cell phones and laptops. Mobile broadband operates through a range of devices, including portable modems and mobile phones. Here, Internet speeds (mean data transmission rate) are generally fewer than fixed broadband services, such as cable, DSL. In his study to evaluate the integration of ICT in instruction in teacher education institutions in Kenya, Chemwei, (2014) established that a teacher knowledgeable in subject content and pedagogy but lacking sufficient knowledge in technology was comparatively ineffectual in the integration of ICT in teaching and learning. This shows that the bridge between extremely experienced and less experienced teachers has been determined by recruiting organizations or government ministries.

In a study to evaluate integration of ICT in instruction in teacher education institutions in Kenya, Chemwei, et al. (2014) found that a teacher experienced in subject content and pedagogy but without adequate knowledge in technology was relatively incompetent in integration of ICT in teaching and learning. This shows that the gap between highly experienced and less experienced teachers has been determined by recruiting agencies or government ministries. Chemwei et al. (2014) additionally found that teachers in the age bracket of 41-50 years and above in teaching profession encountered difficulties in using computers. This means that

teachers with fewer years in teaching profession are eager, skilled and interested in the utilization of ICT tools in teaching and learning processes. In a review of related literatures, Dix (2007) had nonetheless supported the notion that earlier-career teachers had more positive views towards ICT use in teaching and learning than recent-career teachers.

According to Gillespie (2011), new technologies can be used in primary science education to enable students to gather scientific information and interrelate with resources, such as images and videos, and to promote communication and collaboration. Murphy (2006) analyzed the effect of ICT on the teaching and learning of science in primary schools. She indicated that "the Internet is used in primary science both as a reference source and as a means of communication". New technologies may also aid in increasing student motivation (Osborne &Collins, 2010), enhance clearer thinking, and increase interpretation skills with data. The study however did not explore the pedagogical skills applied by teachers when integrating ICT into teaching in the public primary schools.

Chemwei, (2014) additionally established that teachers in the age bracket of 41-50 years and above in teaching profession encountered challenges of using computers. This shows that teachers with fewer years in the teaching profession are enthusiastic, skilled and interested in the use of ICT tools in teaching and learning processes. In a review of related literature, Dix, (2007) had however supported the idea that earlier-career teachers had more positive views towards ICT use in teaching and learning than recent-career teachers. The above studies looked at the challenges experienced by teachers and found out that the teachers had a positive attitude but did not look at whether the ICT resources could be affecting the integration of ICT which this study intends to find out.

Dobbs (2011) in his study stated that schools can only be effective in enhancing teaching, learning and helping students to achieve well-defined educational objectives when the standards, objectives, teaching, curriculum, resources, technology use and assessment are all aligned. The content and methods of assessment must be aligned to measure standards and objectives. Technology provides valuable tools to align the system to promote student learning by providing a means to monitor alignment and communicate these initiatives to the public. However, the study did not look at whether the strategies put in place could be affecting the integration of ICT, which this study evaluated on.

2.4 Evaluation on effect of Teachers Attitude on Integration of ICT in Teaching

Jean (2005) defined attitude as a predisposition to respond favorably or unfavorably to and object or idea or anew innovation (Sanda, 2010) stated that male had slightly more positive attitude toward ICT use than females. The integration of ICT in curriculum has been affected by attitude (2014 found that male teachers had favorable attitude towards use of computers than female teachers. Researchers such as Kandiri, 2010) uncovered that positive attitude towards new technology did not predict ICT integration. They added that teachers 'positive attitude towards technologies did not significantly influence teachers. Passive ability and intentions to integrate and use ICT in teaching; concurrent with this view (VonKatesh & David, 2012) argued that teachers positive attitude new technology did not significantly influence their perceived ability and intentions to integrate ICT into pedagogy

A study conducted by Rozell & Gardner (2010) maintained that teachers' computer experience relates positively to their computer attitudes. The more experience teachers have with computers, the more likely that they will show positive attitudes

towards computers. Positive computer attitudes are expected to foster computer integration in the classroom (Van Braak, Tondeur& Valcke, 2009) observed that, for successful transformation in educational practice, the user need to develop positive attitudes towards the innovation. However, the study failed to look into teachers factors which could influence the integration of ICT into teaching; the study evaluated on the teacher's perception or attitudes or a state of mind or feeling towards integration of ICT into teaching.

A study conducted by Ritchie (2010) established that Integration of ICT in teaching and learning process largely depends on teachers" perception which is a key factor in accepting it in their pedagogical practices. However, the study was carried out in Zimbabwe there was need to carry out the study in Kenya to e establish whether it would yield similar result, (Baylor & Ritchie, 2010). According to Fishbein and Ajzen, teachers" perception about an object could be objectively true or mere opinions, prejudice or stereotypes. This could be influenced by gender, education, training and profession, religious convictions, individuals" character, personality and even relationship with others. Several studies in the last two decades confirm the positive effects that ICT have on teaching and learning in schools. According to Peeraer & Petergem, (2011) ICT benefits schools in several ways: (i) enhance learning in classroom. (ii) improves management of school (for example, it helps in timetabling, record storage, secretarial work like, typing staff meeting minutes, examinations and letters). (iii) Improves accountability, efficiency, and effectiveness in school activities. (iv) Use of PowerPoint presentations and internet.

Hennessey, (2010) takes a cautionary view by stating that putting ICT infrastructure in school does not itself create a stimulating new learning environment that is about shifting the culture of classroom teaching and these of schools. Researchers identified

various kinds of factors that inhibit the use of ICT in the classroom. According to Sang et al (2010), Tedla (2012) and Tay (2011) there are two types of barriers that impede the integration of ICT in teaching and learning and are described as school characteristics or external barriers and teacher characteristics or the internal barriers. The school characteristics are factors that are perceived as major obstacles and they comprise of inadequate access to ICT, internet connectivity, technology related training, ICT policy and time whereas the teacher characteristics include teachers 'beliefs, confidence, ICT skills and teachers' attitudes towards ICT. These variables are interrelated and consequently, the success of or the failure of the implementation of ICT in teaching and learning does not depend on one individual factor but it is a process which involves a set of interrelated factors.

Tedla, (2011) Research studies have shown that effective use of computers is dependent on the teachers" intentions, personal beliefs, and attitudes towards teaching with technology and ICT use (Divaharan & Ping, 2010; Ozden, 2007). Teachers" attitudes towards technology greatly influences their acceptance of the usefulness of technology and its integration in teaching According to Buabeng- Andoh (2012), the more experience teachers have with computers, the more likely they will display positive attitudes towards computers. Many teachers have been found to offer stiff resistance to change involving technology intervention, technology integration and technology incorporation (Albirini, 2007). A number of studies reveal that a considerable number of teachers hold negative attitudes towards implementation hence the integration of ICT in schools. These attitudes range from computer avoidance, anxiety, self-efficacy, enthusiasm, confidence, liking and usefulness of computer towards personal and social life (Manduku et al, 2012; Makhanu, 2010; Lau & Sim 2008; Jimoyiannis & Komis 2007). Age, gender, training, access to a

computer, years of computer use and ownership of computer are also considered as some of the variables used to evaluate attitudes of teachers towards integration of ICT.

In a study conducted by Bakr (2011) on the attitude of high school teachers of English in Syria towards ICT, he investigated the relationship between computer and five independent variables: computer attributes, cultural perceptions, computer competence, computer access and personal; characteristics including computer training background. The findings suggested that the teachers had the positive attitude towards ICT in education and their attitudes were predicted by the mentioned five independent variables. Personal characteristics such as educational level, age, gender, educational experience, experience with computers for educational purpose and attitude towards computers can influence the adoption of a technology Buabeng-Andoh (2012). The attitudes of teachers towards ICT greatly influence their adoption and integration. Teachers' attitudes and beliefs toward technology are among the factors that influence successful integration of ICT into teaching.

Onchwam, (2008) in their study on teachers' attitude stated that if teachers are positive towards the use of educational technology then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes. Negative attitudes towards technology on the other hand among teachers are a key obstacle to successful integration. However, the design used was not clearly stated and the study was done outside Kenya, this study was conducted in Kenya and was aimed at establishing whether the attitude of teachers affects integration of ICT into teaching.

Vanderlande and Braak, (2011) noted that since teachers had never used ICT tools in teaching, it would be useful to embark on more appropriate measures and initiatives in order to improve teachers" attitudes towards implementation of the curriculum through technologies. This was confirmed by Guoyuan (2010) who noted that emerging need for instructional technologies with 21st-century skills can promote equal career prospects in technologies for male and female teachers. Chen (2008) has shown that there is no resonance between teachers' beliefs and their actual practice while integrating technology in the classroom. While most of the previous studies focused more on the influence of teachers' attitudes and beliefs on actual practice (Chai, Koh & Tsai 2010, Palak & Walls 2009; Sang. 2010), it has been rare foray study to investigate the reciprocal relationship between teachers' attitudes and beliefs and their practice .Rozell and Gardner, (2010) noted in their study that majority of teachers who reported negative or neutral attitude towards the integration of ICT into teaching and learning processes lacked knowledge and skills that would allow them to make "informed decision about integration. However, the study did not establish any action taken by the government to avert the state, and the sample size of the study was not stated leaving the findings questionable which this study did.

Keengwe and Onchwari, (2011) identified four different ways schools can offer quality education supported by ICT: real time conversation, learning by doing, directed instruction and delayed time conversation. Higgins, & Moseley, (2011) observed the use of ICT could improve teaching, learning, performance, and management, improves impact on school as a whole, and develop significant skills in the marginalized communities (hence helping in liberation and their transformation). EFA Global Monitoring Report, (2012) observed that use of ICT could help in

achieving, Education For All (EFA) goals. However, the studies did not evaluate on teacher factors on the integration of ICT into teaching which this study did.

The report recommended by Aizen, (2011) defined attitude as a predisposition to respond favorably or unfavorably to an object, an idea or a new innovation. Omollo, Indoshi, and Ayere (2013) found that males had a slightly more positive attitude toward ICT use than females. The integration of ICT in the curriculum has been affected by teachers" attitude. Gode, Obegi, and Macharia (2014) found that male teachers held favorable attitude towards the use of computers than female teachers. Researchers such as Kurga (2014), Mwathi (2014), Mingaine (2013) uncovered that positive attitude towards new technology did not predict ICT integration. They added that teachers positive attitude towards technologies did not significantly influence teachers perceived ability and intentions to integrate and use ICT in classroom activities. Concurrent with this view, Rastogi and Malhotra, (2013) argued that teachers positive attitude towards Vanderlinde and Braak, (2011) noted that since teachers had never used ICT tools in teaching, it would be useful to embark on more appropriate measures and initiatives in order to improve teachers" attitudes towards implementation of curriculum through technologies. This was confirmed by Guoyuan (2010) who noted that emerging need for instructional technologies with 21st-century skills can promote equal career prospects in technologies for male and female teachers. However, the study was not done in Nairobi County; the sample size was not indicated hence there was need for an evaluation study on the teachers' attitude which the study established.

2.5 Evaluation of Effectiveness of Teachers' knowledge in ICT Integration into Teaching

ICT knowledge was defined as being able to handle a wide range of varying ICT applications for various pursue. Research done by Huang and Liaw in (2010) has shown that teachers' attitudes towards technology influence their acceptance of the usefulness of technology and its integration into teaching; the research was done in secondary schools hence the need to do it at primary level. In European School Net (2010) survey on teachers' use of Acer netbooks involving six European Union countries, a large number of participants believed that the use of netbook had had a positive impact on their learning, promoted individualized learning and helped to lengthen study beyond the school day. However, evidence suggests that a small number of teachers believe that the benefits of ICT are not clearly seen Korte and Husing (2011). In the Empirical survey revealed that a fifth of European teachers believed that the use of ICT in teaching did not benefit their students' in learning. There was need for an evaluation study to be carried out on teacher competence in the integration of ICT in Kenya to establish whether the result was similar

Fullan (2011) suggested that training should not be one-shot workshops, but rather ongoing experiences so that teachers can be kept up to date with ever-changing technologies. During the teacher training programs teachers need to be given opportunities to practice using technology more practically so that they can see ways in which technology can be used to augment their classroom activities (Rosenthal, 2010).To implement computers in the classroom, teachers should feel confident and comfortable using computers, through the use of computers on a consistent basis for

instructional activities. Teachers must understand the value of computing in education to be able to benefit their students and to support meaningful learning

A survey carried out on UK teachers also revealed that teachers' positivity about the possible contributions of ICT was moderated as they became 'rather more ambivalent and sometimes doubtful' about 'specific, current advantages. Gutterman , (2009) stated that attitudes are key factors in whether teachers accept ICT as a teaching tool in their teaching practices correspondingly a number of studies were carried out to determine teachers attitude use Harrison and Reinner (2011) conducted their research using data compiled from a survey from776 knowledge and information workers from a large university in the southern united states ,they found the participant with negative computer attitude were less skilled in computer use and were, therefore, less likely to accept and adopt to technology than those with positive attitude. Albiri (2010) conducted a study to investigate the attitude of teachers in Syrian high schools towards technology in education, both qualitative and quantitative were employed to collect results suggested that a third of teachers were interested in teaching through the technology, there is need to establish whether this applies in Kenya.

Jones (2012) in his study looked at the attitudes of teachers towards technology and its influence on the integration of computers into their teaching and found out that most teachers who were ICT illiterate had the negative attitude towards integrating it into teaching; the study involves the use of in –depth interview and documentary review. However, in this study the approach will provide new insight, using questionnaires and interviews. This study will also use observation method to get the reality on the ground.

Brown and Duguid (2000) found out substantial evidence that ICT is an integral part of the global society and its value in schools is to help in knowledge creation, knowledge sharing, problem-solving, communication, group and cooperative learning, development of the economic and social change. According to Webb and Cox (2014), one of the reasons for the unenthusiastic response to ICT-based innovation amongst teachers might be that technological knowledge and skills is either absent or lacking in the processes that underpin teachers' planning. This idea has recently been developed by Mishra and Koehler (2011) and Harris, Mishra, and Koehler (2010), who proposed that there is a tendency for teachers not to synergize their content and pedagogical knowledge with their technological knowledge and that this can result in mundane ICT implementation in the classroom.

Alongside the need to develop teachers' knowledge and skills, their attitudes towards ICT integration also need to be understood. Christensen and Knezek, (2010) indicated that teachers' attitude plays a key role in determining computer use as a learning tool and the likelihood that teachers will effectively use ICT for teaching. Despite these studies being done in various areas, non has been done in Nairobi to establish whether teachers' attitude could be influencing the integration of ICT in Nairobi which this study attempted to establish.

According to Mumtaz, (2000), limited resources within schools are a great impediment to the take-up of the technology in Kenya. For instance, lack of computers and software in classrooms can seriously limit teachers' use of technology. Studies have shown that only a small proportion of the African population has access to computers (Murphy, Anzalone, Bosch, & Moulton, 2002) and 4% have access to the internet Resta and Laferrière, (2010). Aguti and Fraser (2010) reiterated that lack of ready access to technologies by teachers is a key barrier to technology integration

in most developing countries. Other researchers Benson and Palaskas (2010); Snoeyink and Ertmer, (2011) have identified resources as an important part of the implementation of an innovation. In the study, adequate resources refer to a number of ICT resources currently available and accessible to the teachers to successfully use in their classrooms when planning and teaching their lessons. This study however failed to state whether there were adequate resources for the teachers' integration of ICT in classroom which this study attempted to establish.

Tedla (2012) stated that new technologies have the potential to promote and to transform teaching and learning processes. He further asserted that ICTs also provide effective teaching-learning atmosphere by providing opportunities for effective communication between teachers and learners. These new technologies also help learners in the development of knowledge and skills, cooperation, communication, and problem-solving. This is confirmed by Tay, Lim, Lim and Ling Koh (2012) who found that with ICT, the primary school teachers were able to use a variety of pedagogical approaches which included transmissive, dialogic, constructionist approaches to allow learners in their English class to construct their own digital stories, engage in dialogues and exchanges through the comments posted in discussion blog however the study did not state about ithe teacher factors on the integration of ICT into teaching which the current study established.

Tay (2012) also discovered that the use of drill and practice in mathematics enabled learners to master basic computational and arithmetic skills and the immediate feedback worked as a motivational source for more engagement in the learning activities. The authors concur with the findings of these researchers since in our modern times, ICT is ubiquitous in all spheres of life and forms part of the youth's culture. Technology should be used for more than just support of traditional teaching

methods. According to Tezci (2011), teachers should not only learn how to use technology to enhance traditional teaching and increase productivity, but also how ICT can be integrated into classroom activities in order to promote student learning. This means that teachers need to use ICT in more creative and productive ways in order to create more engaging and rewarding activities and more effective lessons (Birch & Irvine 2009; Honan 2008). Hence, Castro Sánchez and Alemán (2011) suggested that teachers keep an open mind about ICT integration in the classroom. It is imperative that teachers learn new teaching strategies to adapt to the new instruments when teaching with technology. However, Yildirim (2014) found that teachers use ICT more frequently for the preparation of handouts and tests than to promote critical thinking. Similarly, Palak and Walls (2013) found that teachers mainly use technology to support their existing teaching approaches and rarely to foster student-centered learning. According to the authors, one possible explanation is the lack of models for how to use technology to facilitate learning and limitations related to contextual factors such as class size and student ability.

Further, Brush, Glazewski, and Hew (2012) found that pre-service teacher preparation does not provide sufficient ICT knowledge to support technology-based instruction, nor does it successfully demonstrate appropriate methods for integrating technology into a curriculum. More training should be provided in pre-service teachers 'curricula, and ICT skills must be applied in the classroom in order to integrate effective technology` strategies (Supon & Ruffini 2009). To help teachers cope with these difficulties, Chen (2008) suggested that rather than only providing education theories, ICT researchers should also document examples of how teachers accomplish meaningful and effective technology integration to meet their pedagogical goals and needs.

Kandiri (2010), in his study, suggested that to successfully initiate and implement educational technology in schools' depend on programs as neither fulfilling their needs nor their students' needs, it is likely that they will not integrate the technology into their teaching and learning. The study suggested the teacher factors which might influence the implementation, however, did not have in – depth study on these factors which .this study intends to look at Becta (2010) in the survey of the UK situation stated that ICT did not benefit their students in learning so the present study will try to superimpose as cited in Bordbar (2010), teachers' computer competence was a major predictor of integrating ICT in teaching. Evidence suggests that majority of teachers who reports negative or neutral attitude towards the integration of ICT into teaching and learning processes lacked knowledge and skills that would allow them to make "informed decision".

According to Schiller (2010), personal characteristics such as educational level, age, gender, educational experience, experience with the ICT for educational purpose and attitude towards computers can influence the integration of a technology. He found out that Teachers are implored to adopt and integrate ICT into teaching and learning activities, but teachers' preparedness to integrate ICT into teaching determines the effectiveness of the technology. The study failed to analyze whether the teachers were competence enough for the integration of ICT into teaching, which this study intends to establish. A student's academic achievements are often used to evaluate teaching effectiveness and are influenced by the use of technology in school. Chang and Wu (2012) concluded that a student's use of technology represents the teacher's integration of technology into teaching and also influences the teacher's effectiveness he added that Educators must be knowledgeable in ICT application to improve their subject matter and content teaching methodologies of their discipline. Teachers

should learn to use technology in ways that support attaining the content standards. However, the study did not look into the influence of the level of teachers training on the integration of ICT which this study intends to establish. Although countries are at the beginning of using new technology, its future use in education cannot be underestimated (Canny & Rhoten, 2010). It is assumed that integrating ICT brings fundamental changes in teaching methodologies.

John and Sutherland (2011) further observed that caution need to be exercised when speaking of new technologies and when assuming that a given medium or technology will automatically afford particular learning outcomes. As new concepts of learning have evolved, teachers are expected to facilitate learning and make it meaningful to individual learners rather than just to provide knowledge and skills. Recent Developments of innovative technologies have provided new possibilities to teaching profession but at the same time have placed more demands on teachers to learn how to use these technologies in their teaching (Robinson &Latchem, 2010). Globally integration of ICT is gaining prominence and the most important component bridging the gap of basic competence of students (Newby et al., 2012) this therefore has put educational systems under great pressure to adopt innovative methodologies and to integrate New Information and Communication Technologies the (NICT) teaching and learning process to prepare students with the knowledge and skills they need in the 21st century. This is why Cooper (2010); Todman (2012), observe that computer anxiety is often highlighted as the problem behind the digital divide.

Whereas Prensky (2010) distinguishes between ICT natives who are born in a digital world and digital immigrants who have to learn the digital language and for whom ICT will always be a second language. Cox (2011) on his part expresses that it is the need to measure among other factors that teacher's beliefs and understanding of the

role of ICT in the subject. Apparently, the teaching profession is evolving from an emphasis on teacher-centered, lecture-based instructions to student-centered interactive learning environments. NICT integration is understood as the usage of technology seamlessly for educational processes like transacting curricular content, students working on technology to do authentic tasks and developing technology supported products, providing authentic assessments and institutional development. Today a variety of NICT can facilitate not only delivery of instruction but also learn process itself. Moreover, NICT can promote international collaboration and networking in education and professional development.

According to IJEDICT (2011) report, integrating ICT into the education curriculum has been promoted as a key step in bridging the digital divide in Kenyan colleges in the recent years and despite the sacrifices made to finance these venture, there has been little evaluation of their effectiveness. However, this did not look into integrating ICT in primary teacher education which the current researcher seeks to investigate. Murithi (2005) argues that in Kenya like most developing countries, integrating ICT is still limited to computer literacy training. The researcher contends that the present ICT curriculum merely deals with "teaching about computers" and not how computers can be integrated to transform teaching and learning in colleges. According to New House (2005), Australia also practices ICT education. Malaysia is another country which gives ICT education priority. The Government grants tax exemption on import of multimedia equivalent as incentives to one of its ICT city referred to as Cyber Taya. ICT use in education is a particularly dynamic stage in Africa (UNESCO 2012). In Kenya, integration of ICT in education is still at limited stage (Murithi, 2011). The NEPAD initiated pilot projects on ICT usage in Kenya is only in primary and secondary.

Omwenga (2011) did a study on how ICT provides a window of opportunities for educational institutions and other organizations to harness and use ICT to complement and support the teaching and learning in Kenya. Oredo (2008) studied the framework of evaluating ICT use in primary teacher education in Kenya, Khalid (2010), investigated barriers to the integration of ICT in general issues. However, the studies did not look into the factors influencing integration of ICT into teaching in primary schools which the researcher of this study seeks to investigate. It is expected that several characteristics of the Teacher in primary schools would significantly influence the ability of learners to learn ICT and the inclination to integrate them in their teaching and learning process. These factors can be discussed under various subtitles. Peralta and Costa (2011) in their a qualitative multiple case-study research on primary school competence and confidence level regarding the use of ICT in teaching practice, conducted in five European countries, found that technical competence influenced Italian teacher's use of ICT in teaching. However, the teachers cited pedagogical and didactic competencies as significant factors if effective and efficient educational interventions are likely to be implemented. There was need to evaluate on the pedagogical skills to establish whether the situation was similar in Kenya.

According to Daniel (2011), in Portugal, teachers reported different views regarding the most important competencies for teaching with ICT. The experienced and new teachers stressed the need for technical skills and attitude, the innovative teachers' emphasized curricula and didactic competencies and the student-teachers cited technical competence and pedagogical efficiency as significant to integrate ICT in teaching and learning processes. There is need to find out whether these factors have been put in place which this study intends to do. Factors (barriers) that discourage the use of ICT by teachers were also reviewed. These factors categorized are into teacher-

level, school-level, and system-level barriers. Teacher-level barriers include lack of teacher ICT skills; lack of teacher confidence; lack of pedagogical teacher training; lack of follow-up of new and lack of differentiated training programs. The school-level barriers comprise absence of ICT infrastructure; old or poorly maintained hardware; lack of suitable educational software; limited access to ICT; limited project-related experience; lack of ICT mainstreaming into school's strategy and the system-level barriers include rigid structure of traditional education systems; traditional assessment; restrictive curricula and restricted organizational structure (Becta, 2010). This study highlighted the application of the traditional approach to teaching in schools however the study did not evaluate the Nairobi County where this study was carried out.

Mulwa and Kimosop (2015) found that the length of service of teachers in teaching profession influences the use of ICT in daily classroom activities. The teachers with 1-5 years of experience in teaching have substantive readiness to adopt and use ICT in teaching unlike teachers with more years of experience but without interests and skills in technology. However, Onwuagboke, Singh, and Ngozika (2014) posted that the number of years of teaching experience of a teacher has a direct relationship with the use of ICT teaching. This entails the fact that the more experienced the teachers are, the more they readily use technology in teaching and learning processes. As cited in Onwuagboke. (2014), in his study with Rahimi and Yadollahi (2011) established no connection between ICT integration and teachers" years of teaching experience. According to Ijedict (2007) report, integrating ICT into the education curriculum has been promoted as a key step in bridging the digital divide in Kenyan schools in the recent years and despite the sacrifices made to finance these ventures, there have been

studies done in colleges. However, they did not evaluate the teachers' factors in integrating ICT in primary schools which the current researcher sought to establish.

Murithi (2011) argues that in Kenya like most developing countries, integrating ICT is still limited to computer literacy training. The researcher contends that the present ICT curriculum merely deals with "teaching about computers" and not how computers can be integrated to help teachers transform teaching in primary schools. As in many other countries in the world, the South African government maintains an optimistic view regarding ICT projects implementation in schools (UNESCO, 2011) ICT is perceived as a panacea to many educational, social and economic problems. In a speech made by President Thabo Mbeki in 2001, he said that South Africans must continue the fight for liberation against poverty, against under-development, against marginalization and information and communications technology is a critically important tool in that struggle (Imbizo for African Youth, 2001, as cited in the White Paper on e-Education (DoE, 2010:10) . At this time, the state of ICT in South African schools was worth considering, since only 26.5% of schools in South Africa were found to be having access to computers for teaching and learning in 2002, according to the White Paper on e-Education (DoE, 2010:1-2). The South African government's response to address the digital divide was to establish the Presidential International Advisory Council on Information Society and Development in 2001 (DoE, 2014, cited in Park, 2014) One of the council's key areas of focus was ICT in education, especially by addressing the digital Divide (DoE, 2014).

In addition, various other policy frameworks have been put in place to enable the integration of ICT into teaching and teach (Williams, 2010). These policies are dealt with in a number of documents published by the South African government, including the "Draft White Paper on e-Education (DoE, 2003) , the Revised National

Curriculum Statement documents for Grades R-9 for the General Education and Training band (DoE, 2011) , the Draft National Curriculum Statement for Grades 10-12 (Schools): Comp typing (Computer Applications Technology) (DoE, 2002) and the Draft National Curriculum Statement for Grades 10-12 (Schools): Computer Studies/Information Technology/Computer Science) (DoE, 2002b) 20 (2012). The attitude of teachers towards ICT greatly influences their adoption and integration. Teachers" attitudes and beliefs toward technology are among the factors that influence successful integration of ICT into teaching (Hew & Brush, 2011; Keengwe & Onchwam, 2010). If teachers' attitudes are positive towards the use of educational technology then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes. Negative attitudes towards technology on the other hand among teachers are a key obstacle to successful integration. It has not been established whether the attitude of teachers affects integration of ICT in teaching primary schools in Nairobi -county. This evaluation study was intended to fill this gap '

2.5.1 Evaluation of Effectiveness of Teachers' ICT skills on the Integration of ICT into Teaching

Teachers' ICT skills and access to the professional development is critical to the integration of ICT in school. Research shows that when teachers view ICT programs as either satisfying their own needs or their students" needs, it is likely they will integrate it into subjects (Hennessy, 2010). A needs assessment is important to find out what ICT skills and knowledge teachers need at schools. Designers of teacher education programs should know the pre-service teachers" perceptions of ICT and their attitudes towards ICT integration into the curriculum (Murphy, 2012).

New ICT tools and teaching approaches call for the training of teachers (Osborne & Hennessy, 2013). The success of integrating ICTs into teaching and learning in developed and developing countries like Kenya depends on how teachers have been prepared to use computers. Since teachers are the backbone in curriculum implementation and integrating computers in schools, they should be trained properly in the use and integration of computers in teaching and learning. When properly trained, teachers" ability to select, integrate and evaluate computer tools to support teaching and learning will improve. However, training of teachers on adoption and use of ICT in most of the developing countries has not been appropriate due to some of the challenges faced (Makhanu, 2010).there is need to evaluate on teacher skills on the integration of ICT for instance, the curricula used for training in most cases are oriented towards teaching technical aspects of technology ignoring organizational and social aspects of ICT. Training of teachers should, therefore, focus on the ICT pedagogical issues of ICT utilization in the classroom situation pedagogical issues of ICT utilization in the classroom situation and not just on ICT skills. Pre- service teacher education can provide teachers with adequate opportunities to experiment with ICT before using it to teach students.

Cox (2010) carried out a study examining the factors relating to the uptake of ICT in teaching. A questionnaire was designed to collect evidence from teachers and other educators about their ICT experiences, expertise and use in teaching, their attitudes to the value of ICT for teaching and learning, the training they had received and, when relevant, their reasons for being a member of an association like Miranda Net, The National Association of Coordinators and IT Teachers and Teacher net UK. The sample consisted of 44 male and 28 female computer-using teachers with a mean age of 42 years. The results showed that the teachers who are already regular users of ICT

have confidence in using ICT, perceive it to be useful for their personal work and for their teaching and plan to extend their use further in the future. The factors that were found to be the most important to these teachers in their teaching were: making the lessons more interesting, easier, more fun for them and their pupils, more diverse, more motivating for the pupils and more enjoyable. Additional more personal factors were: improving presentation of materials, allowing greater access to computers for personal use, giving more power to the teacher in the school, giving the teacher more prestige, making the teachers' administration more efficient and providing professional support through the Internet.

Veen (2011) carried out a study 8 years earlier to describe the day-to-day practice of four teachers from a Dutch secondary school who were implementing ICT in their classrooms. The teachers were provided with the computer at home, and a computer and a liquid crystal display in their classrooms. School factors played an important role on how the teachers made use of their computers including the essential technical support of 20hours per week and the positive attitude of the principal. However, teacher factors outweighed the school factors in explaining the teachers' use of computers. These teacher-level factors were grouped into two subcategories: beliefs and skills. The most important of these were teachers' beliefs regarding what should be in the curricula (content) and the way in which their subjects should be taught (pedagogy). The skills that most influenced their uses of computers were those related to the teachers' competence in managing classroom activities; to their pedagogical skills; and, less importantly, to their computer-handling technical skills. The most important finding from Veen's work is that if the software matched the teacher's pedagogy they used it in Several studies (Hadley & Sheingold, 2011); Sheingold &

Hadley, 2011) used survey data to identify factors likely to be in evidence in teachers who to some extent have integrated computers into their teaching practices.

According to Becta (2011), lack of ICT concentration in initial training is a barrier to teachers" use of ICT in integrating it in the subject matter. Therefore, where there is no effective training on ICT, teachers will not be able to use ICT resources for integration purposes. Becta (2011) also stated that many teachers 22 who do not consider themselves to be well skilled in using ICT feel anxious about using it in front of a class of students who perhaps know more than they do. Effective integration will depend to a larger extent on trained and supported teachers (UNESCO, Bangkok, 2010). The greatest challenge of the schools, therefore, has been the provision of adequate support to teachers in as far as acquisition of appropriate technical skills important for integrating computers into the classroom instruction is concerned. It has, therefore, not been established whether teacher training influences integration of ICT in teaching of English in secondary schools in Mumias sub-county and this study intends to fill this gap. Like many other countries in the world, Kenya has developed National ICT Policy (2011). It sets out the nation's aims, principles and strategies for the delivery of Information and Communications Technology to improve the livelihoods of Kenyans (MoE, 2011b) Ministry of Education (MoE) introduced the National ICT Strategy for Education and Training (Farrell 2007). The ICT policy gives an opportunity for establishment grass root based infrastructure for knowledge sharing (Mureithi and Munyua 2010; MoE, 2011a).

The ICT in Education Options Paper (MOEST 2011) discusses the ways in which information and communications technologies (ICTs) can be leveraged to support and improve the delivery of quality education for all Kenyans. It provides a comprehensive Vyas- Doorgapersad (2014) found that training of teachers in the new

technology was hampered mainly by inadequate ICT skills and facilities. The MOEST trains teachers of Mathematics and Sciences ICT integration under CEMASTEA programs. The training was meant to be part of teacher motivation and induction for adequate preparation to integrate ICT in the curriculum. Through in-service training, teachers gain technological experience and knowledge through lessons that require them to define, design and solve learning problems in classroom scenarios (Mishra & Koehler, 2011). Moreover, effective implementation of ICT in educational institutions of Bangladesh largely depends on teachers and principals, who require in-depth professional development due to lack of knowledge and skills. Vigilant attention needs to be given to in-service teacher training for both teachers and principals and pre-service training for newly appointed teachers before joining.

Afshari (2010) states that, professional development is necessary for teachers to enable them to effectively use technology to improve student learning. The regular classes to acquaint them with the important role of technology in schools settings and to train them on how to prepare and use ICT competently. Staff development should be collaboratively created, based on faculty input and school needs. It must prepare teachers to use technology effectively in their teaching. But this training should not consist merely of short workshops or training, which is not enough to build proper knowledge and skills in relation to this argument.

Fullan (2011) suggested that training should not be one-shot workshops, but rather ongoing experiences so that learners/teachers can be kept up to date with ever-changing technologies. During their teacher training programs, teachers need to be given opportunities to practice using technology. More practically so that they can see ways in which technology can be used to augment their classroom activities (Rosenthal, 2010). To implement computers in the classroom, teachers should feel

confident and comfortable using computers, through the use of computers on a consistent basis for instructional activities. Teachers must understand the value of computing in education to be able to benefit their students and to support meaningful learning (Novak 2011). So changing teachers' negative attitudes is essential for increasing their computer skills. Therefore, if teachers want to successfully use technology in their classes, they need to possess a positive attitude to the use of technology. Such an attitude is developed when teachers are sufficiently comfortable with technology and are knowledgeable about its use (Harrison & Rainer, 1992; Afshari et al, (2011).

Mumtaz (2010) stated that schools can go only so far to encourage ICT use; actually, take up depends largely on teachers' personal feelings, skills, and attitudes. Even if teachers are provided with up-to-date technology and supportive networks, they may not be enthusiastic enough to use it in the classroom. Teachers need to be given the evidence that ICT can make their lessons more interesting, easier, more fun for them and their pupils, more enjoyable and more motivating. ICT is a relatively new field in the Bangladesh education systems, more in depth research should be conducted related to integration of ICT into classroom situations, to show that ICT can make their lessons.

Research conducted by Plomp, Anderson, Law, & Quale, (2012) observed that access to ICT infrastructure and resources in schools is a necessary condition to the integration of ICT in education. According to the study, effective integration of ICT into teaching in schools depends on availability and accessibility of ICT resources such as hardware, software.' However, the study research tool used was not indicated and was also conducted in secondary schools hence the need to do the same in primary schools to establish whether the findings are similar Bafe (2010). This study

investigated the teachers' access and knowledge to computers, in primary schools as key elements to the successful integration of technology.

However, Mwathi (2014) noted that Kenya is facing a significant shortage of trained teachers to implement ICT integration in the curriculum along with a challenge of inadequate ICT infrastructures in public secondary schools. Shazia, (2000) found that despite having few certificates in computer packages, few teachers were capable of using computers in their personal and professional work. The available study had therefore recommended that teachers need to acquire practical skills and competencies in instructional technologies in order to attain the educational. The availability of trained teachers has been globally considered as a key strategy for the advancement of the new technological innovation in the curriculum (OECD, 2004). Training teachers on ICT integration help to provide them with competencies and skills of how to incorporate ICT tools in their respective subjects in the classroom environment (Gaible, Bloome, Schwartz, Hoppes & Vota, 2011).

Sahlberg (2010) noted that deficiency of teacher development programs in Finland influence integration of ICT in teaching and learning processes. In India, the use of Information and Communication Technologies (ICTs) is limited because of a low number of adopters, especially among female teachers. A report by OECD (2014) revealed that 19% of teachers were trained in ICT, while 18% of teachers were able to access and use ICT in their private and professional activities. This shows a very low number of teachers with ICT skills and potential to access ICT tools to prepare lessons based on suitable application software (Rastogi and Malhotra, 2013). There was need to evaluate on the teacher skills effects on the integration of ICT.in teaching, which the study did.

2.5.2 Evaluation on Effect of Teachers Knowledge on Application of ICT Resources into Teaching

Preston and Cox (2013) in their study stated that effective integration of ICT into teaching in schools depends mainly on the availability and accessibility of ICT resources such as hardware, software, etc. Obviously, if teachers cannot access ICT resources, then they will not use them. Cox (2010,) found that teachers placed great importance on computer ownership and access to ICT for personal use as a factor that influenced their adoption of ICT in teaching practice. Becker's (2012) report of findings from the Teaching, Learning and Computing Survey (Becker, Ravitz, and Wong, 1999), indicated that classroom access to local computer clusters or hubs were more frequently used in teaching and learning than computing laboratories. Similarly, a study by Yildrim (2011) found that access to technological resources is one of the effective ways to teachers' pedagogical use of ICT in teaching. However, none of the studies looked at the effects of learning resources in the integration of ICT in the teaching strategies which this study intends to do.

On the school level, factors such as professional development, accessibility of ICT resources, leadership and technical support facilities influence teachers' adoption and integration of technologies into their classrooms. Teachers' professional development is a key factor to a successful integration of computers into classroom teaching. ICT related training programs develop teachers' competencies in computer use (Bauer & Kenton, 2005).

According to Gillespie (2011), found out that new technologies can be used in primary science education to enable students to collect scientific information and interact with resources, such as images and videos, and to encourage communication and collaboration. Murphy (2006) reviewed the impact of ICT on the teaching and

learning of science in primary schools. She indicated that "the Internet is used in primary science both as a reference source and as a means of communication. New technologies may also help to increase student motivation (Osborne & Collins, 2010), facilitate clearer thinking, and develop interpretation skills with data.

Dobbs (2011) in his study stated that schools can only be effective in enhancing teaching, learning and helping students achieve well-defined educational objectives when the standards, objectives, teaching, curriculum, resources, technology use and assessment are all aligned. The content and methods of assessment must be aligned to measure standards and objectives. Technology provides valuable tools to align the system to promote student learning by providing a means to monitor alignment and communicate these initiatives to the public. However, the study did not look at whether the strategies put in place could be affecting the integration of ICT, which this study intends to do.

Ofsted (2001) in his study observed that practice and teaching methods remain in place under a thin coating of technological glitter, and available technology is often underused and poorly integrated into classroom practice. For instance, the recent Third International Mathematics and Science Study [TIMMS] surveys. Martin (2010) found that at least 10 per cent of students reported frequent use of computers in their lessons in both subjects in only two countries – Israel and the US. National teacher surveys paint a similar picture. In the US, combined data from three surveys showed that only half of the teachers who had access to computers used them in their lessons as observed by Smerdon (2010) Both studies looked at the application of learning resources in classroom practice and found out that it was poorly integrated. However the study was carried out in Israel, there was need to evaluate whether similar

situation occurs in Kenya and whether the learning resources affect the effectiveness of the integration of ICT into teaching.

Schools ICT 2011 envisaged that ICT advisors would be appointed in education centers to support the work of the NCTE by providing leadership, training, and support, including online support, at the regional level and by providing regular feedback on progress and issues arising. Ultimately some twenty ICT advisors (later increased to twenty-one) one in each of 16 the full-time education centers-were appointed. The main role of these advisors may be summarised as follows: to advise and support teachers in their region in integrating ICT in their teaching and in their students' learning, to build a knowledge base on all matters relating to the use of ICT in their local schools. A report on the implementation of Schools ICT 2000 published in 2001 revealed a high level of satisfaction with the initiatives implemented under ICT 2000 -National Policy Advisory and Development Committee (Tubaishat and Lansari, 2011).

Afshari (2009) state that, professional development is necessary for teachers to enable them to effectively use technology to improve student learning. Staff development should be collaboratively created, based on faculty input and school needs. It must prepare teachers to use technology effectively in their teaching. But this training should not consist merely of short workshops or training, which is not enough to build proper knowledge and skills. In relation to this argument, Fullan (2011) suggested that training should not be one-shot workshops, but rather ongoing experiences so that learners/teachers can be kept up to date with ever-changing technologies. During their teacher training programs teachers need to be given opportunities to practice using technology more practically so that they can see ways in which technology can be used to augment their classroom activities (Rosenthal, 2010).

To implement computers in the classroom, teachers should feel confident and comfortable using computers, through the use of computers on a consistent basis for instructional activities. Teachers must understand the value of computing in education to be able to benefit their students and to support meaningful learning (Novak 2010). So changing teachers' negative attitudes is essential for increasing their computer skills. Therefore, if teachers want to successfully use technology in their classes, they need to possess a positive attitude to the use of technology. Such an attitude is developed when teachers are sufficiently comfortable with technology and are knowledgeable about its use (Harrison & Rainer, 1992; Afshari et al, 2011). In this connection, Mumtaz (2011) states that schools can go only so far to encourage ICT use; actual take-up depends largely on teachers' personal feelings, skills, and attitudes. Even if teachers are provided with up-to-date technology and supportive networks, they may not be enthusiastic enough to use it in the classroom. Teachers need to be given the evidence that ICT can make their lessons more interesting, easier, more fun for them and their pupils, more enjoyable and more motivating.

According to Tubaishat and Lansari, (2011) the report, however, identified three issues of concern as follows: the need for more training for teachers, the need for more funding (equipment and computers, maintenance, support), the need for more support (technical support, encouragement to use ICT). Based on its findings, the committee made recommendations covering a range of areas, including policy, funding, and the professional development of teachers, pre-service teacher education, infrastructure, and technical support. As ICT is a relatively new field in the Bangladesh education systems, more in-depth research should be conducted related to the integration of ICT into classroom situations, to show that ICT can make their lessons more interesting, easier.

Previous research has indicated that both external and internal factors influence ICT use in education (Al-Ruz and Khasawneh 2011; Lin, Wang and Lin, 2012; Sang et al. 2011; Tezci, 2011a). Among the external factors, the most common are access to computers and software, insufficient time for course planning, and inadequate technical and administrative support (Al-Ruzand Khasawneh, 2011). Among the internal factors, teachers' attitude, confidence, and belief in ICT use are commonly cited in the existing literature (Al-Ruz and Khasawneh, 2011; Chen 2008; Lin, Wang and Lin, 2012; Sang *et al.*, 2011; Tezci, 2011a). The research appears to have identified all possible external and internal factors influencing ICT use (Al-Ruz and Khasawneh, 2011; Lin, Wang and Lin, 2012; Sang et al., 2011; Tezci, 2011a); however, there has been meager research into the possible relationships between external and internal variables, and how these relationships differ according to the variables involved in ICT integration. Examining these relationships could not only help teachers, students, and administrators understand the challenges of ICT use better, it could also assist them in uncovering other solutions to overcome the existing barriers based on the relationships among different variables.

In 2001 the Government launched its second policy document on ICT in education, (A Blueprint for the Future of ICT in Irish Education). This was a three-year strategic plan designed to support the continuation of the main initiatives begun under ICT 2000 and to build on the progress achieved under that plan. The main objectives of the Blueprint policy were to: to expand ICT capital provision to schools, increase access to, and the use of, internet technologies, further integrate ICT in teaching and learning, enhance professional development.

Farrell and Isaacs (2008) conducted a study in Rwanda to assess the level of development of the ICT policy. The study established that the policy was based on ten

key pillars as mentioned earlier in this review. According to Farrell, the policy developed ensured special ICT application in education by enabling initiatives for academic exchange and twinning. The policy highlighted the implementation of the SMART schools concept where technology platforms are used to enable distance learning and rural penetration of ICT and penetration of ICT. This study seeks to assess whether a similar situation exists in Kenya and how it has impacted on the education among primary schools in Nairobi County.

2.6 Evaluation on Teacher's Gender Relationship on ICT Integration in Teaching

The introduction of ICT into the educational sector has created new aspects of gender inequalities and created new stereotypes in the society. In a World Bank report (2009), gender plays an important role in the social learning behavior and expectations between the men and the women in the society. In a study by Markauskaite (2005), men have always been considered as key domains in the development of the computer technology. The study admits that there are very clear distinctions between the male and the female as highlighted in the recent studies. These differences can be seen in access to ICT and more so in the integration of ICT in teaching. It was, further noted   that the sampling procedure of the study was not stated leaving the findings questionable.

Choudrie and Lee (2014) sought to assess whether gender had any significant effect on the integration of ICT into teaching. This study was conducted in   Australia which is among the most advance   countries I n technology advancement. Though the results indicated a difference in the gender but there is need for a similar study to be conducted in Kenya to ascertain the results. Fialova (2016) sough to establish

established whether technology was considered a gender-neutral issue. The study analyzed the effect of gender and established that there was lack of coherent research practice on gender disparities in ICTs across human levels of interaction. It was also revealed that there has been a slow but steady uptake of technologies among the different genders especially the females. The integration of ICT in education through the use of telephones, mobiles or computers to enhance teaching is a matter of concern to researchers hence the need for this study.

Dholakia, and Kshetri, (2014) conducted a study to assess the relationship between gender and the use of the internet's in Africa. The study revealed that, there was a low participation level of women's in the use of the internet ranging from 12% to 38%. The imitation for this study was that the sample size was too small for the results be generalized to the entire population. The study also did not focus on the integration of ICT into teaching which the current study did.

Ngeno, Githua, and Changeiywo (2013) investigate the level of readiness between the male and the female teachers in the integration of technology in teaching of mathematics in secondary schools. The study established that there was no significant difference between the readiness of female and male teachers in the integration of ICT in teaching. . The study however, did not consider schools in the developing countries like Kenya. Hence the need for this study. Although technology is growing very fast, access to internet and use of personal computers is mostly hampered by gender digital divide particularly in education sector. The gender digital divide was viewed as a globally emerging issue that could influence effective adoption and use of ICT in teaching and learning (UNCTAD, 2014). With regards to adoption and usage of technologies in education,

According to Akbaba and Kuruback (1998) developed nations have narrowed the digital dive between the male and the female to a great extent. Results from developing countries such as Senegal, have revealed that women's technological literacy rate has remained significantly low (38.7%) compared to that of men which is estimated at around 61.8% (UNESCO, 2014). There is therefore a misconception among the gender about ICT hence fewer women are able to undertake technology related studies as they consider it a male dominant field. The study was conducted outside Kenya, there was need to conduct one in Kenya to establish whether the findings were similar and to evaluate on, whether the different in gender was one of the teacher factors in integration of ICT into teaching which the study did.

A study conducted by Guoyuan, 2010) established that the major challenge facing the adoption of technology among the women is the is attributed to gender stereotyped. Rimyan (2016) in the other hand sought to investigate the gender differences in ICT experience and literacy among trainee teachers. The findings of the study revealed that there was a significant difference in ICT capability between he mae and the female with male scoring more higher than women in matters related to ICT use. Dix (2007) established that male teachers had more confidence about ICT use than female teachers. That female teachers face a lot of changes regarding the use of ICT, in teaching and learning. However, the various studies carried out did not look into gender influence in the integration of ICT into teaching. The current study evaluated on gender to establish whether it is one of the teacher factors influencing the integration of ICT into teaching particularly in public primary schools in Nairobi County, Kenya.

The development of ICT policies has now been considered an issue of concern by majority of the countries in the world (Broadley, 2012). For instance countries like

Chile, Finland and the USA have clearly defined policies and goals to support the education systems (Kozma and Anderson, 2010). Major investments have been made to increase the numbers of computers in schools and the networking of classrooms. While governments do all they can to initiate computer implementation in schools, it is the poorer countries who have lagged behind in the computer implemented process.

2.7 Evaluation on the effect of Teachers' factors` in Application of ICT Learning Resources

According to Quale (2010) effective integration of technology in the education systems involves substantial funding, that is very hard to manage in developing countries like Bangladesh due to their poverty index. Yildrim (2011) on the other hand indicated that access to technological resources is among the most effective ways of integrating technology in teachers' pedagogical in teaching. The required devices such as ICT-supported hardware, software, the internet, audio visual aids, teaching aids and other accessories were also not available to support the integration because of the cost element. These studies did not consider aspects of infrastructural adequacy and learning resources hence indicating a gap in the literature that this study intents to address.

Sandy (2010) on the school level, factors such as support, funding, training, and facilities influence teachers' integration of technologies into their classrooms. Teachers' professional development is a key factor to the successful integration of computers into classroom teaching. ICT and related training programs develop teachers' competencies in computer use. According to Wozney (2010), the adoption of technology was influenced by the attitude of the teachers hence the study established that effective integration of ICT in teaching calls for change in the teacher's attitude towards computers. Keengwe and Onchwari, (2011) noted that

there was a need to assist teachers reorganize the task of technology and how new technological tools influence the students learning. These studies also provide great insight in understanding the challenges facing ICT integration in education but they failed to analyze whether there are enough resources for teachers for the integration into classroom which this study attempted to establish.

Mumtaz (2000) conducted a study to assess the changes facing integration of ICT in school. In the study conducted among schools in Kenya, it was noted that the lack of resources within schools was one of the greatest impediment to adoption and use of technology in Kenyan schools. The study noted that there was lack of proper infrastructure in terms of class rooms, hard ware and also software. There was also lack of competent and skillful teachers to enhance the integration. For instance, lack of computers and software in classrooms can seriously limit teachers' use of technology. Studies have shown that only a small proportion of the African population has access to computers (Murphy, Anzalone, Bosch, & Moulton, 2002) and 4% have access to the internet Resta & Laferrière, (2010).

Aguti and Fraser (2010) reiterated that lack of ready access to technologies by teachers is a key barrier to technology integration in most developing countries. Snoeyink and Ertmer (2011) on the other hand identified resources being very critical in the implementation of an innovation. It was revealed that adequate resources enhance accessibility of the teachers to successfully use ICT in their classrooms when planning and teaching their lessons'. These studies however, failed to state where there were adequate resources for the teachers' integration of ICT in classroom which this study attempted to establish.

Plomp, Anderson, Law, and Quale, (2012) conducted a study to assess the level of access to ICT infrastructure and resources in schools. The study also sought to establish the resources that were necessary for integration of ICT in schools to be effective. It was revealed that ICT resources were a necessary condition to the integration of ICT in education. The study revealed that effective integration of ICT in teaching depends on availability and accessibility of ICT resources . However, the study research tool used was not indicated and was also conducted in secondary schools hence the need to do the same in primary schools to establish whether the findings are similar Bafe (2010). . This study investigated the teachers' access and knowledge to computers, in primary schools as key elements to the successful integration of technology.

Sang (2011) sought to examine the internal factors related to teachers which affect the adoption and use of ICT. The study established that, teachers internal factors that affect integration include; beliefs, attitudes toward technology integration; perceptions, motivation to use ICT, self-confidence, knowledge and technology skills. Al-Ruz and Khasawneh (2011) on the other hand discovered two common issues associated with internal factors. First, teachers may implement policies based on limited or improper theoretical interpretations and comprehension of ICT use if the facilities are not made available. Secondly, teachers may bounder pressure to cover all content and be unwilling or hesitant to let students spend more time exploring content on their own with technology due to their own conflicting beliefs. According to his findings, a school culture emphasizing competition and a high stakes assessment system but ignores the provision of resources can discourage teachers from integrating technology into their classrooms. There was need to evaluate whether the

ICT resources are one of the factors influencing teacher in the integration of ICT use in the classroom (Chen, 2010).

The initiative to establish a School Technology Innovation Center (STIC) in Nairobi will serve as a hub where education leaders and teachers access the latest information on technology solutions that are proven to enhance innovative teaching and learning, thus improving the skills needed by students to thrive in the 21st century. According to Ayere, Odera & Agak (2010), there is rich literature on ICT initiatives in Kenya both by GOK and nongovernmental organizations (NGOs). GOK and the U.S. Agency for International Development (USAID) have a joint commitment to improve education in Kenya by providing resources in collaboration with Kenya's Ministry of Education. This is aimed at accelerating 21st Century Education (ACE) by improving the quality of primary and secondary education through the effective use of information and communications technology (ICT). Andiko (2010) concluded that there is need for a study to establish whether the learning resources are in place for teachers to use in integration in primary schools.

A report in the World Fact book (2010) showed that Kenya has government ICT Board whose main objective is to avail quality and affordable technical support to the Digital Villages to enable their smooth operation. The board has technical support focus points of a standardized method for the testing and implementation of new software, the upgrading of hardware and the overall tracking of licenses and equipment. It also develops a collaborative relationship with the person responsible for Technical support and encourages them to include capacity building in the planning of future changes. The board works closely with the educational institutions to ensure quality technical services as well as the internet providers.

Andiko (2010) established that in an attempt to integrate ICT in Kenyan secondary schools, various challenges such as lack of adequate number of computers in the schools, inability to acquire sufficient computers or update those which are obsolete is due to lack of finances, fast changing technology and high overhead costs, loaded curriculum which make it difficult to find time to prepare ICT teaching materials. Kidombo (2009) cited lack of a unified school curriculum and secondary schools, resistance by teachers to use ICT in teaching , the lack of government employed Teachers the schools are forced to hire thus draining the scarce resources which could have been used for upgrading the ICT facilities. This is backed by the government report on ICT capabilities in secondary schools in Kenya (Kadzo, 2011). However, the studies have not been done at primary level. There was need to evaluate the effectiveness of teacher factors on the integration of ICT and whether the situation is similar in primary schools which this study did.

Blanskat, Blamire, Kefala (2011) conducted a study carried out, in European schools with the aim to draw evidence regarding the advantages and benefits of ICT in schools' achievements. It seeks to measure the impact of ICT on students' outcome Kefala (2011). The study tried to establish a link between the use of ICT and students' results in exams and concluded that. : ICT has a positive impact on students' performances in primary schools particularly in English language and less in science however the study did not look at the teacher's factors which this study evaluated.

Kefala (2011) found out in his study that, schools with a higher level of e-maturity showed a rapid increase in performances in scores compared to those with a lower level. In addition, schools with sufficient ICT resources achieved better results than those that are not well-equipped. The study stated that there was a significant improvement on learners' performances and there was need for, teachers to become

more convinced that educational achievements of pupils are due to good ICT use however the study was done in Europe there is need for the similar study to be done in Kenya which this study intended to investigate. Despite the study finding out that high percentage of teachers in Europe (86%) states that pupils are more motivated when computers and the Internet are being used, However the study failed to focus on evaluation of effectiveness of teacher factors on the integration, which this study established

According to Kadzo (2011) findings, schools with sufficient ICT resources achieved better results than those that are not well-equipped. In these schools there is a significant improvement on learners' performances and this may lead to teachers become more convinced that educational achievements of pupils are due to good ICT use. In fact, a high percentage of teachers in Europe (86%) state those pupils are more motivated when computers and the Internet are being used in class. Blanket (2011) categorized the factors that prevent teachers from ICT use into teacher- level, school-level and system-level barriers. Teacher-level barriers include lack of teacher ICT skills; lack of teacher confidence; lack of pedagogical teacher training; lack of follow-up of new and lack of differentiated training programs. The school-level barriers comprise the absence of ICT infrastructure; old or poorly maintained hardware; lack of suitable educational software; limited access to ICT; limited project-related experience; lack of ICT mainstreaming into school's strategy and the system-level barriers include rigid structure of traditional education systems; traditional assessment; restrictive curricula and restricted organizational structure.

A study by Yildrim (2011) found that access to technological resources is one of the effective ways to teachers' pedagogical use of ICT in teaching. The Turkish study by Usluel, Asker & Bas (2011) showed that majority of the respondents reported having

access to computers and the internet. 82.5% and 81.2% of faculty members had access to computers and the internet respectively. However, the study failed to investigate the actual situation in primary schools which this study intends to do. The technique applied was also not stated. This makes the findings of the study questionable

According to Tubaishat and Lansari (2011), three issues of concern were identified as to affect the integration of ICT in training for teachers; the need for more funding (equipment and computers, maintenance, support), the need for more support (technical support, encouragement to use ICT). However, the research design was questionable the study was all carried in Uganda, there is need for similar study to done in Kenya Based on its findings, the committee made recommendations covering a range of areas, including policy, funding, and the professional development of teachers, pre-service teacher education, infrastructure, and technical support. Despite the recommendations the integration of ICT still drug behind in Kenya there was need to evaluate the effectiveness of teacher factors which this study established.

In 2001 the Government launched its second policy document on ICT in education, dubbed "A Blueprint for the Future of ICT in Irish Education". This was a three-year strategic plan designed to support the continuation of the main initiatives begun under ICT 2000 and to build on the progress achieved under that plan. The main objectives of the Blueprint policy were to: to expand ICT capital provision to schools, increase access to, and the use of, internet technologies, further integrate ICT in teaching and learning, enhance professional development opportunities for teachers

BECTA, (2011) observed that Schools in the LDCs especially in Africa and those in their development phase have not been left behind as far as ICT in education is concerned. Bordbar (2011) points out that many developed countries have

implemented ICT successfully into schools for teaching and learning, and argue that, owing to the cost of implementing ICT into education, many LDCs have fallen behind with the implementation process due to availability of learning resources, According to Broadley (2012), most governments around the world see the development of ICT policies as indispensable to the successful integration of ICT in education Despite this establishment, very few research has been done in Kenya to prove this, hence the need to evaluate the effectiveness of the teacher factor on the integration in Kenya, which this study intended to establish,

In a report published by UNESCO (2010) on the state of ICT projects in education in Africa states that, although ICT in education is seen as significant in many aspects in a computer-rich world, there is still a huge gap regarding the implementation of computers in schools between rich and poorer countries. A report by World Bank (2010) the disparity that exists between the individuals who understand and use ICTs and those who do not affects the adoption and used of the ICTs. There is improved use of computers in schools hence countries are now equipping their classrooms and providing networking at the class room level (2002).

Castro Sánchez, and Alemán, (2011) in his study on digital divide established that the implementation rate of computers in schools was almost 90 -100% in developed countries.

ICT policies are yet to be developed by governments in Africa to ensure successful integration of ICT from research, the attempt to integrate ICT in Kenyan secondary schools is faced with various challenges such as Lack of adequate number of computers in the schools, inability to acquire sufficient computers or update those which are obsolete is due to lack of finances, fast changing technology and high

overhead costs, loaded curriculum which make it difficult to find time to prepare ICT teaching materials, Lack of a unified school curriculum in primary and secondary schools, resistance by teachers to use ICT in teaching and learning, the lack of government employed Teachers the schools are forced to hire thus draining the scarce resources which could have been used for upgrading the ICT facilities (Kidombo 2009, Oloo 2009). This is backed by the government report on ICT capabilities in secondary schools in Kenya (Kadzo, 2011).

Blanskat, Blamire, Kefala (2012) conducted a study carried out in national, international, and European schools with the aim to draw evidence regarding the advantages and benefits of ICT in schools' achievements. It seeks to measure the impact of ICT on students' outcomes. The study also tried to establish a link between the use of ICT and students' results in exams. The findings are interesting: ICT has a positive impact on students' performances in primary schools particularly in English language and less in science. Schools with a higher level of e-maturity show a rapid increase in performances in scores compared to those with a lower level.

A quantitative study conducted by Albirini (2010) was meant to collect evidence from high school English teachers' views on computer attributes, cultural perceptions, computer competence, computer access, and personal characteristics result revealed that 57% of the respondents had computers at home and 33.4% had access to computers at school. This is an indication of teachers' inadequate access to computers. Further, the National Centre for Education Statistics (2000) as cited in Afshari, Bakar, Luan, Samah, & Fooi 2009) report revealed that over 50% of the respondents used computers for research and lesson preparation in their schools. About 78% of the respondents complained of inadequate access to computers in the classroom. Of this percentage, 38% of the respondents stated that inadequate

computers were not great barriers to ICT use in their teaching, but improved availability and fairness of access to technology resources by teachers, students, and administrative staff is essential. Access to hardware and software is not only important, but also the use of suitable kind of tools and program to support teaching and learning. This study evaluated on the resources to establish whether teachers and pupils have enough access to computers in schools and whether this could ineffectiveness in the integration of ICT.

A study conducted by (Friedhoff, 2011) stated that a technological tool needs to be carefully considered when the tool is incorporated in the lesson and make a distinction of access to ICT resources. Dexter & Reidel (2009), in his study, revealed that 37.4% of the teachers had access to computers and 14.4% of the students had access to computers, implying that ICT is more available to teachers than students. The study was done in secondary schools hence there is need to investigate whether teachers in primary schools have access to ICT resources which this study intends to find out. The benefits of ICT usage in the preceding paragraph are indicative of why some teachers integrate ICT across the curricula. The advocates of ICT in education Eze and Olusola, (2013); Castells, (2000) assert that ICT in the classroom is essential for the provision of opportunities to enable learners to operate in the information society since the traditional methods of teaching do not prepare the learners to be productive.

Today's teachers also face a challenge of teaching 'the Net Generation' which actually comes to class equipped with multimodal skills who are constantly in touch, motivated and responding to the ever-changing worlds. These learners have the ability to use any technology they come across. Teachers, therefore, have to change their attitudes and beliefs as far as the teaching activities are concerned and adopt technology in order to perform the pedagogic activities with ease and confidence.

Research studies such as Eze and Olusola (2013) also reveal that teachers use ICT to expand pedagogical resources available and to facilitate knowledge sharing with fellow teachers. As much as ICT help learners in completing their educational tasks, ICT also give teachers an opportunity to help learners with particular needs.

The exposure initializing various digital tools also encourages learners to reinforce the learned material using the individual learning styles (Tedla (2012). It was further noted that teachers use ICT tools in order to make the lessons more interesting and engage learners according to learners' potentials. Over and above this, it is beneficial to learners from digitally poor backgrounds as they are provided with the opportunity of being included in the use of ICTs for knowledge sharing and in making the world flat by enabling global communication with anyone, anytime and anywhere.

In Nigerian Hennessy, Harrison and Wamakote (2010), established that teachers, who use new technology in teaching and learning, indicated that ICT is very useful and in teaching and learning because it makes the whole process easier and effective. In other underdeveloped and developing countries, the use of ICT is considered as a foreign idea and borrowed policies. The inadequacy of the development of African states does not have funds to sustain the use of ICTs in their schools. In the Sub Saharan region where ICT use in teaching and learning is deemed important, the integration is not fully utilized as expected and experienced in the well-developed countries.

Makgato (2012) assessed the teachers use of ICTs in their teaching and established that most teachers were afraid of new innovations and change and are technophobic despite the availability of ICTs resources in their schools. Majority of the teachers especially women shun away from ICT and continue to use traditional methods of

teaching and learning. This approach has limited the use and application of ICT in education. Research has proven that teachers are key figures for the successful integration of ICT in teaching and learning and are also agents of change. In many instances, lack of technical skills is another contributor in non-use of ICT in teaching and learning. The use of ICT is to a large extent dependent on the provision of learning resources which the study looked into.

However, Eze and Olusola (2013) reiterate that the role of the teacher is changing as ICT are inventing new roles for teachers. Teachers' role of transmitting knowledge is also seen as being replaced by encouraging learners to construct their own knowledge, engage in problem-solving activities, develop critical thinking skills, using the internet to search and select the required information, fostering collaborative work for peer teaching, knowledge sharing and social interaction. They further assert that through ICT some resources such as overhead projectors and chalkboards are becoming redundant and obsolete when learners have access to the same networked resource on which the teacher is presenting the information.

Huang & Liaw, (2010) noted that there are numerous factors that influence teachers' use of ICT. Teachers' feelings, knowledge, and attitudes influence their use of ICT in teaching. Research has shown that teachers' attitudes towards technology influence their acceptance of the usefulness of technology and its integration into teaching. If teachers' attitudes are positive towards the use of educational technology then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes.

Russell & Bradley, (2010) maintained that there is need to research on whether personal characteristics such as, anxiety, lack of confidence and competence and fear

often leads to ICT takes a back seat to conventional learning mechanisms which this study supports. Therefore, an understanding of personal characteristics that affect teachers' integration of ICT into teaching is relevant.

A study carried out by Keengwe and Onchwari, (2011), established that teachers' attitudes has a significant effect on educational technology adoption and hence integration in teaching. When the teachers have a positive insight about the adoption and integration of ICT into teaching and learning processes. Demici (2011) conducted a study on teachers' attitudes towards the use of Geographic Information systems (GIS) in Turkey. The study used questionnaires to collect data from 79 geography teachers teaching in 55 different high schools. The study revealed that though barriers such as lack of hardware and software existed, teachers, positive attitudes towards GIS were an important determinant to the successful integration of GIS into geography lessons. These findings were based on the study done in turkey hence the need to evaluate whether the findings in Kenya would concur with the findings in Turkey.

In a similar study, Teo (2011) conducted a survey on pre-service teachers' attitudes towards computer use in Singapore. A   sample of   139   pre-service teachers was assessed for their computer attitudes using questionnaires with four factors: effect (liking), perceived usefulness perceived control, and behavioral intention to use the computer. He found out that most teachers were more positive about their attitude towards computers and intention to use a computer and usefulness of the computer in teaching.

According to research done by Peralta & Costa (2011), teachers with more experience with computers have greater confidence in their ability to use them effectively. To

conclude, Jones (2010) reported that teacher's competence relates directly to confidence. Teachers' confidence also relates to their perceptions of their ability to use computers in the classroom, particularly in relation to their children's perceived competence. According to Hennessy, (2010) ICT should be used as a tool to support school objectives like cooperation in school, problem-solving, communication, developing skills, assessing and searching information- which is essential in the preparation of students for the knowledge society.

A study by Higgins, & Moseley, (2011) found that teachers who use ICT in classroom perceived it as useful for personal work and for teaching and were prepared to continue using it due to its usefulness. Some of the usefulness of ICT by teachers this study found were: making teaching more interesting, easier, and more diverse, more fun for them and students, more enjoyable and motivating to students. Additional personal usefulness was found to be: allowing larger access to the computer for personal use, improving the presentation of materials in class, giving more prestige to teachers, giving more power to teachers in school, providing professional support through the internet and making management in school more efficient and effective in the 21st century. This is why Cooper (2011); Todman (2010), observe that computer anxiety is often highlighted as the problem behind the digital divide.

Whereas Prensky (2010) distinguishes between ICT natives who are born in a digital world and digital immigrants who have to learn the digital language and for whom ICT will always be a second language, Cox et al. (2010) on his part expresses that it is the need to measure among other factors that teachers beliefs and understanding of the role of ICT in the subject. Apparently, the teaching profession is evolving from an emphasis on teacher-centered, lecture-based instructions to student-centered interactive learning environments. NICT integration is understood as the usage of

technology seamlessly for educational processes like transacting curricular content, students working on technology to do authentic tasks and developing technology supported products, providing authentic assessments and institutional development. Today a variety of NICT can facilitate not only delivery of instruction but also learn process itself. Moreover, NICT can promote international collaboration and networking in education and professional development.

According to Tubaishat, and Lansari (2011), the report, however, identified three issues of concern as follows: the need for more training for teachers, the need for more funding (equipment and computers, maintenance, support), the need for more support (technical support, encouragement to use ICT). Based on its findings, the committee made recommendations covering a range of areas, including policy, funding, and the professional development of teachers, pre-service teacher education, infrastructure, and technical support.

In 2011, the Government launched its second policy document on ICT in education, (A Blueprint for the Future of ICT in Irish Education). This was a three-year strategic plan designed to support the continuation of the main initiatives begun under IT 2000 and to build on the progress achieved under that plan. The main objectives of the Blueprint policy were to: to expand ICT capital provision to schools, increase access to, and the use of, internet technologies, further integrate ICT in teaching and learning, enhance professional development opportunities for teachers (BECTA, 2009). Schools in the LDCs especially in Africa and those in their development phase have not been left behind as far as ICT in education is concerned. Bordbar (2011) points out that many developed countries have implemented ICT successfully into schools for teaching and learning, and argue that, owing to the cost of implementing ICT into education, many LDCs have fallen behind with the implementation process.

According to Broadley (2012), most governments around the world see the development of ICT policies as indispensable to the successful integration of ICT in education. According to Kozma and Anderson (2010), countries from Chile to Finland and from Singapore to the United States have all set national goals and policies that identify a significant role for information and communication technologies (ICT) in improving their education systems and reforming their curricula. Major investments have been made to increase the numbers of computers in schools and the networking of classrooms (2002). While governments do all they can to initiate computer implementation in schools, it is the poorer countries who have lagged behind in the computer implemented process.

A report published by UNESCO (2010) on the state of ICT projects in education in Africa states that, although ICT in education is seen as significant in many aspects in a computer-rich world, there is still a huge gap regarding the implementation of computers in schools between rich and poorer countries. This is what is known as the 'digital divide (Williams, 2011). World Bank (2010) describe the 'digital divide' as a growing disparity between those individuals and communities that have and those that do not have easy access to new information technologies, (2010). The digital divide is more evident in the implementation rate of computers in schools, especially in Kenya. The challenge is whether there are enough resources for integration, and if so, are there other teacher factors affecting the integration of ICT which this study investigated.

According to Castro Sánchez, and Alemán, (2011), many developed countries have had a 90 – 100% computer integration success rate; developing countries have had less success with the implementation of computers in their schools. For example in the United Kingdom, the government spending on educational ICT in (2011) in the

UK was £2.5bn, in the United States, the expenditure on K-12 schools and higher education institutions was $6 billion and $4.7 billion respectively in 2009 and in New Zealand, the government spends over $ 410 million every year on schools ICT infrastructure Ajayi, (2009) . Despite all these investments on ICT infrastructure, equipment, and professional development to improve education in many countries, Barolli, (2012) claimed that huge educational investment has produced little evidence of ICT adoption and use in teaching and learning especially in Turkey. Evidence suggests that education sector is investing heavily in ICT projects but the implementation of these educational ICT projects lagged behind than in the business sector Bingimlas, (2009) the study however did not look at teachers factors which this study was intended for.

According to Polikanov and Abramova (2011) although Internet access in Africa is among the lowest in the world, ICT in Africa is rapidly increasing. Many African states now have Internet access, with South Africa the leader in this regard in southern Sahara. They further argue that the majority of Internet users in Africa are rich males, who speak English or any other Western language and live in the cities. However, many African countries still do not have adequate Internet connectivity due to a lack of infrastructure Afshari, (2011). This inadequacy in ICT infrastructure and connectivity reflects the pessimists' idea Bingimlas, (2010) notes that ICT will broaden the divisions that exist in the so-called 'digital divide' Warschauer, Knobel and Stone(2010) cited in a gap between the rich and the poor nations in the provision of ICT resources. It was vital to evaluate whether the schools in Kenya have enough learning resources especially in primary section and whether the lack of resources was affecting the effectiveness of i the teacher integration of ICT into teaching.

2.8 Theoretical Framework

This study was guided by Innovation Diffusion Theory by Rogers (2003) which explains how new ideas diffuse into a given population. The theory of Innovation-Diffusion is the process through which an individual passes: first knowledge of an innovation, to forming an attitude towards innovation, the decision to adopt or reject, the implementation of the new idea, and finally to confirmation of this decision (Rogers, 2010). The theory stated the process that communities used in incorporating new ideas. How new ideas spread through a given population of people. Diffusion of innovation is the process by which an innovation is adopted and gains acceptance by members of a certain community.

The theory was applied in this study on the evaluation of effectiveness of teacher factors on the integration of Information Communication Technology into teaching in public primary schools in Nairobi County, Kenya. The introduction of ICT process occurs over time and can be facilitated through action to educate, invite and support teachers in incorporating new technologies, approaches, or products and services into teaching in primary schools (Rogers, 2010 Therefore this theory is applicable to this study.

Innovation diffusion research theory has attempted to explain the variables that influence diffusion, how and why users adopt a new information medium, such as the ICT into society. This can be related to the variables in this study such as the pedagogy. Knowledge, attitude and competency. The factors looked into in this study, includes' teachers' pedagogical skills, teacher's competence, teachers 'attitude and Gender as independent variables while ICT integration as Dependent variable, (Rogers, 2010).

This theory explains why individual embrace technological change and adopt innovations more readily than others do. This may be explained by the application of diffusion of innovations theory (Rogers, 2010). He further concludes that diffusion of innovation is a type of social change highly dependent upon the individuals who are involved in the adoption of the innovation. Since Rogers uses the terms innovation and technology interchangeably, the diffusion of innovation framework seems particularly suited for the study of the adoption of ICT into primary schools' curriculum. Since the teachers 'factors are indispensable to the innovation-decision process, the study aimed at evaluating effectiveness of teachers' factors on the integration of Information Communication Technology into teaching.in public primary schools in Nairobi County, Kenya. .The summery of the variables in the study is presented below in the conceptual frame work.

2.9 Conceptual Framework

In this study, the researcher identified a number of teacher factors that affects integration of Information and Communication Technology (ICTs) into teaching in Public primary Schools. In the study, the descriptive survey design was used to explain the relationship between the dependent variables and the independent variables and showed how independent variables influenced the dependent variables (Nachmias & Nachimius, 2008). The independent variables in the study were, teacher's attitudes, teacher pedagogical skills and teachers" competence. And teachers' gender. The dependent variable for the study was Information and Communication Technology integration into teaching in public primary schools.

The review of a related literature and findings of the study, developed the following conceptual frame work that tended to affect a particular outline in a more pictorial (Nachmias &Nachimius, 2008).

Demographic characteristics	School management	ICT integration into teaching in

Independent Variables   **Intervening Variables**   **Dependent**
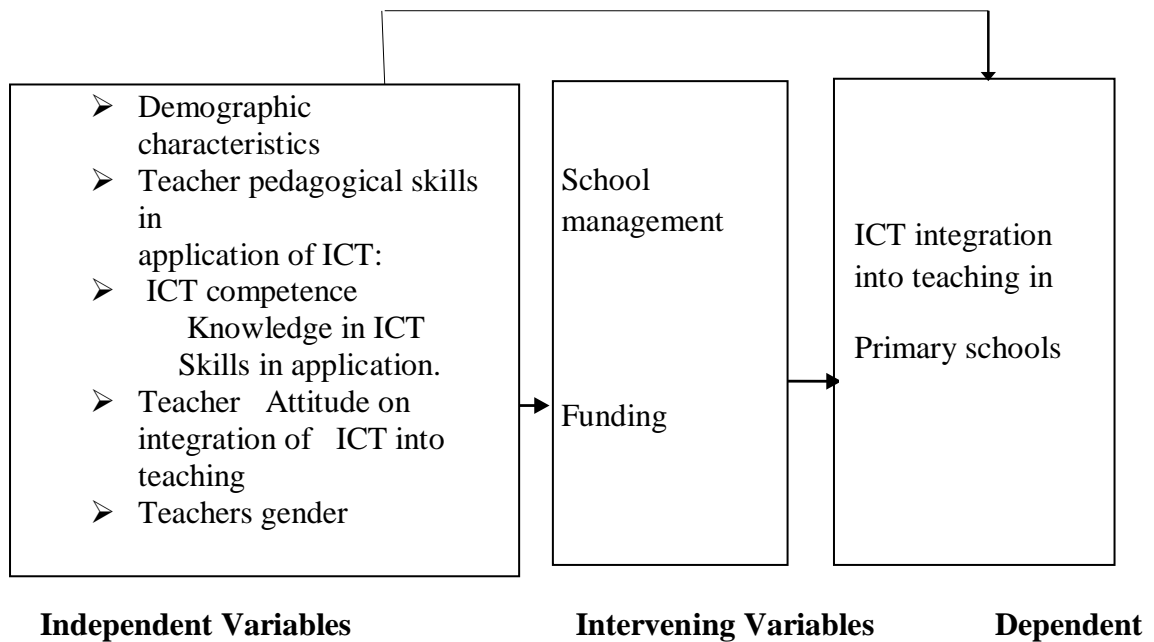
Figure 2.1: Conceptual Framework

From the conceptual framework, the teachers" demographics influences the integration of ICT negatively as older teachers tend to stick to the traditional ways of teaching while the younger teachers adopt the technology. This negative attitude toward s integration influences the competence of members in the integration leading to low integration in teaching. Effective integration of ICT is attributed to change in the teachers" attitude which is attributed to being enthusiastic and confidence with technology. This can be improved through teacher training and thus the teachers will be adequately prepared to handle their ICT in teaching. The overall result is change in teaching methods as the teacher is able to use technology in the classroom and also internet as a research tool.

The intervening variable could indirectly influence ICT integration. This: refers to the ministry of education and all stakeholders aimed at enabling the teacher to integrate technology and eventually contribute to knowledge society which will be

absorbed in the job market and lead to industrial growth. Intervention strategies have to be done to ensure training in integration of ICT is put in place to demystify the impeding variables ICT .

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides an operational framework for data collection and analysis. It gives a description of the research design, target population, sample size and the selection criteria that the researcher used. It also addresses data collection tools, validity, reliability, data collection procedure as well as data analysis. It also considered ethical and logistical issues of the study.

3.2 Research Design

The study adopted a descriptive survey design. According to Kothari (2004) this design is most appropriate for use in studies where data is collected from the respondents in their natural setting. The design gives the state of affairs and is also suitable for studies where an in-depth search for answers and explanations is required. The design allows collection of data by either sues of questionnaire or interview (Orodho, 2010). The design allows a researcher to generalize the results from a sample to the entire population and to helps to save on time and costs. Descriptive survey research design presents an opportunity to fuse both quantitative and qualitative data as a means to reconstruct the "what is" of a topic /study.

According to Trochim (2006) this design is very appropriate for studies where the opinion and trends are analyzed. The design enables collection of data from a defined group of respondents who form the sample for the study.   The design however is limited by biasness in the construction of the research instruments.   The descriptive survey design was, therefore, selected because the researcher wanted to ascertain the attitudes, views on their pedagogical skills and competence in

integration of ICT   in teaching. The design was also selected due to its ability to enable the researcher to obtain and to administer the questionnaire to a large sample. The design was used for this study in order to obtain data from the respondents that is teachers and head teachers about their opinion and perceptions of the

The design was applied in collecting data using interviews and questionnaires that were administered to the teachers and the head teachers in the various schools in Nairobi County.

3.3 Population of the Study

The study targeted the 1772 respondents of whom 1567 were teachers and 205 were head teachers from the 205 primary schools in Nairobi County. The population comprised of head teachers and teachers from the various primary schools in the County.

3.4 Sample Size and Sampling Procedures

According to Orodho (2004) an appropriate sample size for a large population should range from 10% to 30%. If the target population is below 5000 then the recommended sample size should be at least 30% of the population. The study therefore used a sample of   30% of 1772 which was 532 was selected.   From this sample the proportion of teacher sand head teachers was computed and presented in table 3.1.

Teachers were 1567 /1772 * 532 =   470

Head teachers were 205 / 1772 * 532   =   62

The sample was selected using both stratified and simple random sampling methods. The teachers and hear teachers formed the main strata for the study. Care was taken to

ensure that the male and female were selected for the study to avoid the gender bias. During the sampling process all the head teachers were given random numbers which were written on small pieces of paper and put in a small ballot box where an independent person was asked to pick 62 papers from the box to form the sample for the head teachers.

The sample for teachers was also selected using the same method. The male teachers were put in one separate box similar to female teachers the schools which were randomly sampled by a ballot where the teachers random numbers were picked randomly randomly from a box. The proportional sampling was carried out in all sub counties by calculating 30% of the number of schools in each sub county. The sampled schools were then taken as the representation of the population. These subsets of the strata were then pooled to form a sample of the study. (Kerlnget 2011) Thus, the study obtained a sample of 532 respondents from six sub counties. This was a representative of the total population of teachers and head teachers in Nairobi County**.**

This study used a sample size of 30% of the total population of 1772 which included 1,567 teachers and 205 head teachers. According to Jwan (2010), a sample size of 30% of the target population is large enough so long as it allows for reliable data analysis and allows testing for significance of differences between estimates. Therefore, a proportionate sample size of approximate 532 respondents which was 30% of total population was randomly selected

The table below shows the sample size of approximately 532 respondents which was 30%. Of the total population. This resulted in 30% of 205 head teachers which led to 62 head teachers, and 30% of 1567 teachers resulting to 470 teachers. hence total

number of headteachers sampled were 62 and teachers were 470 totaling to 532 respondents. The information is captured in the table below;

The sample size was 532 respondents. Target population = No of all teachers and head teachers in the county . School sample size = 30% of the total population 30/100x1772 = 532 respondents.

Table 3.1 : Sample size and sampling procedure

The table shows the number of teachers sampled from each sub county in Nairobi.

Sub county	No. of teachers	No. sampled (30%)		No. of H/T sampled
		TRS	H/T	
Dagoretti A	220	66	30	9
Starehe B	182	55	27	8
Westlands C	192	58	29	9
Kamkunji D	1 99	60	30	9
Embakasi E	278	83	29	9
Langatta F	275	83	30	9
Kasarani G	248	65	30	9
TOTAL	**1567**	**470**	**205**	**62**

From each county, 30% of the number was sampled through random sampling. From this study, a sample of 62 head teachers was obtained from 205headteachers and 470 teachers were sampled from 1772 to obtain a sample of 532 respondents from seven sub counties. This was a representative of the total population of teachers and head teachers'' in Nairobi County.

The study Stratified random sampling and simple random sampling techniques were applied in the study to obtain a sample from the target population. To determine

sample size, the study applied simple random sampling on the stratified schools from each sub county in Nairobi to obtain a total sample of 532 respondents from a total population of 1772. This was to ensure that all schools from the seven sub counties were represented in the sample The table below shows the number of respondents interviewed in each category

Table 3.2: Number of Respondents

Category	Target population	Sample 30%	No. Interview
Head teachers	205	62	58
Teachers	1567	470	450
Total	**1772**	**532**	**508**

Sources of Data

The sources of data for this study were   450 teachers from 62 schools who filled the questionnaires and 58 head teachers who were interviewed. In order to obtain primary data questionnaire and interview were employed

3.5 Data Collection Instruments

The data collection instruments chosen for the study were Interview schedule and open-ended questionnaire. Their use varied depending on the information being sought and the target information so as to ensure that all needed information is arrived at. Wellington (2000), states that in carrying out a research, a researcher should use methods which provide high accuracy, generalizability and explanatory power with minimum management demands while upholding administrative convenience. Mwiria and Wamahiu (2010) noted that: "the qualitative research uses multi-techniques for

data collection in order to obtain a holistic view of the researcher". This study used the following instruments to collect the data:

1) Questionnaire for teachers (QT)

2) Interview Schedules for head teachers (IST)

The instruments supplemented each other to close the gaps which could be left if only one instrument was used. The researcher was guided by the study objectives when constructing these instruments. The questionnaires were used as the principal data collection instrument from the teachers. The Questionnaires consisted of section A and B. Section A addressed the respondent's general information while section B addressed the study objectives. The interview schedule was for head teachers and had similar questions.

3.5.1 Questionnaires for Teachers (QT)

Questionnaires were designed with research objectives in mind in order to elicit responses on each objective, in section A there were four closed –ended questionnaires seeking the information on the background of the respondents, Section B of the questionnaires sought the answers for objective one on the Pedagogical skills, it had four questions which were open ended and one closed ended question with the fifth question on methodology. Section C sought to evaluate on teacher's ICT competence, the questionnaires seek to establish teachers' skills and competence in application of ICT. Section D, addressed the teachers Attitude towards ICT integration, it had two closed – ended questionnaires' and a Likert scale table to be filled. Section E addressed the Gender objective which sought to find out whether teacher gender influence ICT integration, it had three open ended and two closed – ended questions.

The questionnaire contained both open and closed-ended questions to allow for collection of qualitative and quantitative data. Section (A) delt with a general overview of the academic and professional qualification of the respondents. The questionnaires were used to collect data to get information from respondents in the sampled schools. The questionnaire sought to evaluate teacher factors on ICT integration in primary schools.

Interviews were designed with research objectives in mind in order to elicit responses on each objective. They contained both open and closed-ended questions to allow for the collection of qualitative and quantitative data. Section A delt with a general overview of the academic and professional qualification of the respondents while Section B had Questions based on the objectives of the study. Each questionnaire contained thirty questions which were all answered by the respondent as indicated in (Appendix A.) section A had four questions on the background of the respondents, section B Had two open ended questions and three closed ended questions on pedagogical skills. In section C The questionnaires were intended to establish teacher competence in integration of ICT, Three questions were in a table and were closed ended while two questions were open ended and Section D dealt with Attitude, where questions on Likert scale were asked to determine the attitude this can be seen in Appendix A.

3.5.2 Interviews Schedule (IS)s

Kane (2010) notes that interviews can be modified to fit needs of the situations; they can convey empathy, build trust, collect rich data and provide a clear understanding of the respondent's view. However, researchers choose interview technique because it gives them an opportunity for in-depth data, ensuring high response rate and it also

encourages naturalness (Nkpa, 2011). For this study, interview schedules were used to supplement the questionnaires and were constructed to follow the same outlines as the questionnaire. Each section had five questions based on the objectives of the study. They were exclusively administered to the administrators of the sampled public schools. The head teachers from the sampled schools were interviewed and results were recorded. The interviews contained guiding questions on demographic information and other questions as per the objectives of the study as contained in (Appendix B.)

3.6 Piloting Instruments

A pilot study is very important t for establishing whether the study instruments are reliable and valid. According to Kothari (2004) the process of assessing whether the research instruments will provide the expected data it called piloting. According to Jaggar (2010) a one percent to two percent (1% to 2%) of the population is considered adequate to conduct a pilot test. Mugenda and Mugenda (2012) recommended a sample proportion of between 1- 10% of the sample size as being adequate for a pilot test. For this study 10% was considered for determining the sample for the pilot. From the sample of 532 a total of 53 respondents were selected for this study.

The researcher conducted a pilot from among teachers and head teacher from three selected schools that is 10% of 205 which gave 21 schools. The researcher conducted a pilot study from among 21 schools distributed across the county. The 21 schools will not be considered for the main study. Among the sub counties selected for the pilot were Makadara, Njiru and Kibra sub counties from which the instruments of the study were administered.

The 21 schools were selected equally from the three sub counties. This study adopted 10% of the population from the three sub counties in the Nairobi County. The teachers sampled were eighteen with three headteachers. The results from the pilot helped to improve the final instruments. The data collected during the piloting of the research instruments was prepared, analyzed and interpreted. Based on the outcomes, the instruments were reviewed further in readiness for data collection. The researcher corrected and also had the instruments appraised and amended by supervisors and experts in the area of study.

3.7 Validity of Instruments

The degree to which pilot results are able to represent the phenomenon under study is referred to as validity (Mugenda and Mugenda, 2003). There are different measures of validity for this study, content validity was tested. This is a measure of the degree to which the data collected actually measures what was expected. Content validity helps to examine whether the content of the instruments can actually give the expected results for the study. Validity was used to assess whether the content of the questionnaire measured what it was supposed to measure through piloting. Face validity was determined by using opinion of key respondents for this study this was achieved by requesting the supervisors and other key people in the education sector to go through the questionnaire and help to improve the structure of the questions.

Kothari (2011), stated that for the instrument to be valid the content selected and included in the questionnaire and interview schedule must be relevant to the variable being investigated. The validity was done using the results of the pilot study. According to Mugenda and Mugenda (2005) Validity refers to whether a scale

measure or correlation with the theoretical construct that it purports to measure. It is the extent to which what was supposed to be measured is measured (Pennington, 2003). In validity, the researcher checked the operationalization against the relevant content domain for the construct. The researcher checked the performance of her operationalization against some criterion which is a direct comparison and standard judgment. The findings led to a conclusion that the instruments measured what they were supposed to measure and therefore were valid. This was guided through discussion with the research experts and lecturers in the department of the curriculum, instructional and Educational Management of Maasai Mara University.

3.8 Reliability of the Instrument

Reliability is the ability of the tools to give same response after repeated administration. It is concerned with the degree to which a particular measuring gives a similar result over a number of repeated trials (Orodho 2008). According to Best and Kahn (1989), the reliability of an instrument is the degree of consistency that an instrument demonstrates; that is, the accuracy of the test scores which are free of choice errors. The researcher used the split-half method where the total number of items was divided into two halves to observe a linkage existing between the two halves. The correlation estimated the reliability of each half of the test.

The researcher used statistics adjustments to estimate the reliability of the two tests (Orodho 2008). The research instrument for this study was administered on two groups of individuals during the same period of time (Kolhari, 2004). The reliability coefficient of the responses was calculated using the Pearson's product moment correlation coefficient formular the value of (r) formulae, in Karl Pearson

product moment correlation co efficient formulae, the value of "r" lies between= 0.7 to 0.9 (Kothari, 2004)

A pilot study was conducted whereby the researcher tested both the questionnaires and interview guide prior to embarking on data collection. Split-half method was used to test the reliability and validity of the instruments. Split- half technique involved dividing the instruments into two halves and then administering the instrument to two different groups at the same time. The reliability was tested using the Cronbach Alpha Reliability coefficient which was computed using the SPSS version 24 software. According to Kothari (2014) Cronbach alpha reliability is done to establish the internal consistency of the instrument. This method helps to save the researcher's time as the instrument is only tested once and subjected to the test.

The rue of the thump is that when the reliability coefficient is 0.7 and above the instrument is considered reliable. For this study the, the instruments yielded a reliability of 0.81 and 0.82 respectively and hence they were acceptable as being reliable. The researcher had, therefore, modified the research instrument so as to eliminate the inconsistencies in themes and grammatical errors to achieve the content validity. The piloting aid in validating instruments focusing on eliminating errors for effective study in evaluation of teacher factor on the ICT integration in teaching in public primary schools in Nairobi. The two sets of scores for each group were correlated using Pearsons product co-relation to test reliability of the instruments (Best & Kahn, 2006). Applying formular shown below;

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

The modified instruments were then used to collect the data on the sampled schools to determine the teacher factors on the integration of ICT into teaching.

3.9   Data Collection Procedures

The clearance was got from Maasai Mara University Post Graduate Department then the researcher proceeded to seek for the permit from the National Commission for Sciences, Technology and Innovation (NACOSTI). Further Permission was sought from the Sub-County Education Officer to undertake the research in the county, then from the head teachers so as to undertake the study in their schools. The researcher was assisted by three research assistants who distributed the questionnaires to the respondents. The respondents were then guided on the questionnaires and were requested to respond to the questionnaires accordingly. They were assured of confidentiality. Data were collected through interview schedule and questionnaire which were conducted at the designated time.

Survey method of data collection was used as a method of Collecting information by interviewing or administering Questionnaire to a sample of individual teachers. Therefore, the study was conducted through collecting primary data from the teachers and headteachers about teacher factors effect on integration of Information and Communication Technology in teaching using questionnaires, and interview schedules, as they are the key players in the integration of ICT in the teaching process.

3.10 Data Analysis

Data analysis involves processing raw facts, figures and numerals into meaningful information by sorting, coding, cleaning and processing and interpreting data (Cohen,

Manion & Marrison, 2007). In this study, the researcher planned the layout of the questionnaire for ease of analysis using serialized numbering method. Data were coded to help classify the data into meaningful categories. Quantitative data were analyzed using descriptive statistics. These included frequencies and percentage, Tables, Graphs, and charts which could easily be interpreted by many people. Qualitative data from interviews were organized into narratives. Regarding the descriptive data the analysis were done with the aid of (SPSS) version, 21 and software were used for data storage, and for the calculation of frequencies and percentages. The qualitative data analysis was guided by the research questions. The analysis revolved around the data reduction, organization, and matching as well as the generation of categories that resulted from the study of all data sources. The analyzed data was interpreted and presented on bar graphs, pie charts and tables to enhance efficiency of the study (Cohen *et al*. 2007).

3. 11 Ethical and logistical Issues

The interviewees and participants were given a clear indication of the purpose and outcomes of research. The participants were assured that the data collected would be used in complete confidentiality and purely used for educational purpose. Privacy and confidentiality were observed all through. The researcher adhered and respected the time schedule agreed upon with the head teachers and teachers. In order to avoid unethical conduct in data collection, the researcher strived not to reveal names, residence or addresses of the participants that may ultimately cause social damages to their personal lives or to their families. Basically, observing the privacy of the respondents helps the researcher to create rapport, obtain trust and inspire the respondents to willingly and voluntarily give honest responses. Last but not least, the

researcher observed the underlying objectives of the study and use the data in accordance with intended purpose (of this study) but not for personal interests.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings and Discussions of the study. The chapter sought to evaluate on   the effect of teacher factors on the integration of Information Communication Technology into teaching in public primary schools in Nairobi County, Kenya. It specifically evaluated on the teacher competence, teachers' Attitude' and teachers' relationship between teachers' gender and ICT integration in Nairobi County. This study   addressed the following objectives;

i.   To evaluate on the effect of demographic characteristics of respondents in public primary schools in Nairobi County.

ii. To evaluate the teachers' Pedagogical skills in the integration of Information Communication Technology into teaching in public primary schools in Nairobi County.

iii. To evaluate the   effect of teachers'   competence in ICT   integration in teaching in public primary schools in Nairobi County.

iv. To evaluate the effect of the teachers' Attitude towards the Integration of ICT into Teaching in public primary schools in Nairobi County.

v.   To evaluate the relationship between   teachers' Gender and ICT Integration into teaching in public primary schools in Nairobi County.

4.2 Response Rate

The study administered 532 questionnaires to the respondents which were distributed in each of the six sub counties in the sampled schools in Nairobi County in order to collect the necessary data. The 508 of the 532 questionnaires were filled in and

returned; hence the response rate was 91%. Out of 62 head teachers who were sampled, 58 were interviewed while out of 470 teachers 450 teachers filled the questionnaires and returned giving a total of 508 respondents which is 90% of the respondents. The remaining 24 did not submit their questionnaires; this represented 8% of the total population. This high response was possible through constant follow up with the respondents. Mugenda and Mugenda (2008) observed that a 50 percent response rate is adequate, 60 percent good and above 70 percent is rated as very good. The response rate of the study was 91% which is satisfactory and adequate for the study hence the data collected can be generalized The information was presented as follows:-

Table 4.1: Response Rate on headteachers interview and teachers questionnaires

Category	No Sampled	Number Interviewed (F)	% Interviewed	Number Not Interviewed
Number of head teachers	62	58	11%	4 (1%)
Number of teachers	470	450	89%	20(5%)
Total	**532**	**508**	**100 %**	**24 (5%)**

From the above table, a total of 450 respondents (teachers) returned the questionnaires and.58 headteachers were interviewed giving a total of 508 respondents Only 24 (5%) of the respondents failed to return the questionnaires This shows that majority of the respondents returned their questionnaires which was 95%

of the total number of questionnaire distributed. Hence, the finding of the study could be generalized.

4.3 Demographic Characteristics of the Respondents

This section evaluated the effectiveness of demographic, characteristics of teachers on the integration of ICT into teaching, the study sought to explore the demographic characteristics of the respondents so as to evaluate the background information of the respondents into ICT integration into teaching The respondents were the teachers and Headteachers in the sampled schools. The demographic characteristics that were evaluated involved: age, academic qualification and number of years one has stayed in the current working stations. The questions evaluated on the respondent's characteristics on the integration of ICT in teaching. The questions evaluated the respondents Gender, Age and Qualifications. The findings are indicated below.

4.3.1 Distribution of the Respondents by Age

The questionnaire on Appendix 1 section (A); sought to evaluate on the respondents age and its role on integration of ICT. The respondent's responses were as follows; Forty-point one eight percent of the respondents were between 30 and 50 years old. 7.59 were under 30 years old, while the remaining 50 .89% were over 50 years old. The finding implies that the majority of the teachers were over fifty years.

Table 4. 2 Age of Respondents

Age distribution of teachers (Years)	Teachers Frequency (f)	Percent (100%) not applying ICT
25 <less	8	1.7 %
26 – 35	34	7.6%
36---50	180	40.%
Over 50	228	50.7%-
Total	450	100

In addition to this, the ages of teachers illustrated the degree of participation of teachers in their teaching activities depicting that a large number of teachers (408) were not applying ICT into teaching who were in their late forty and above. (42) Respondent who were still in the age of 35 and below were applying ICT into teaching. . The obtained findings helped the researcher to evaluate the age factor of respondent's effect on the integration of ICT in teaching.

4.3.2 Evaluation on Effectiveness of Educational Qualifications of Respondents
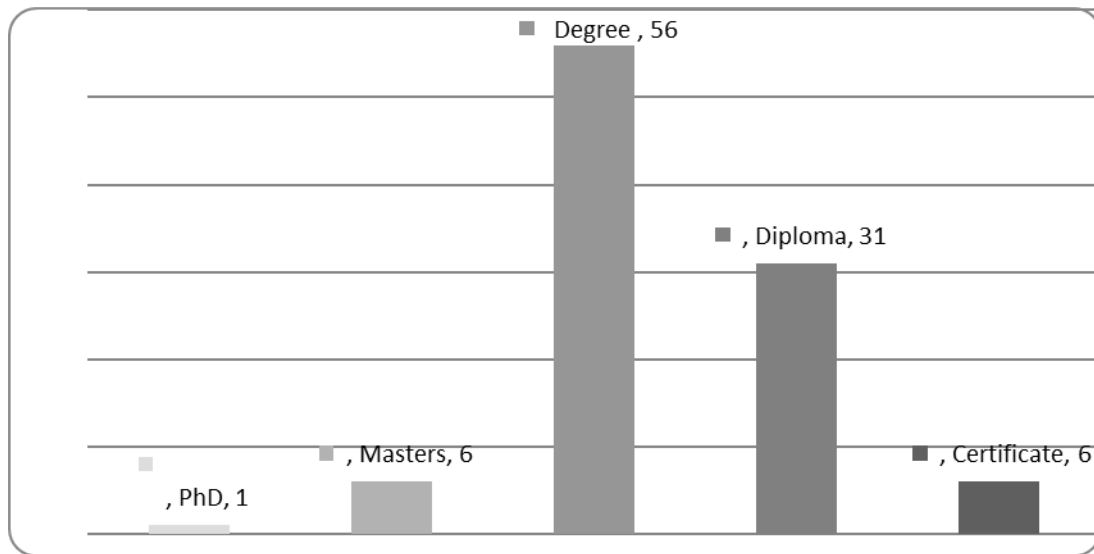
Figure 4.1 Distributions of the Respondents by Educational Qualifications

The researcher needed to evaluate the effectiveness of the level of education of the respondents in ICT Integration in teaching. The respondents were asked to explain whether their level of qualification had a role in the use of Information Technology in the classroom. From the responses, Fifty-six percent of the respondents had attained a degree, however only 10 % were applying ICT into teaching 31% were diploma holders but only 3% were applying ICT into teaching, 6% were certificate holders however only 1% were applying ICT, 6% had done masters but only 1% are applying ICT' .While only 1% had attained PhD and none was applying ICT. The findings indicated that the respondents are fully qualified and well educated. Despite high level of education, majority of 56%who had Degree were not applying ICT in teaching only 4% of them were applying ICT.

The evaluation of the study concurs with the views of Cziko (2011), who believes that teachers do not have enough qualification in ICT integration. From the findings one can deduce that the level of education does not affect the application of ICT as shown

in Figure 4.3.2 where most teacher have attained high level of education but unable to integrate ICT in teaching. This evaluation report agrees with Daniel (2011) who suggested that teachers needed technical training in ICT despite their qualifications.

4.3.3 Evaluation on the Duration of Application of Computers and Related Technology by Respondents

The question sought to evaluate on how long the respondents have been applying ICT into teaching The question was to evaluate the duration the respondents had been using computers and related technology and whether it 'affects ICT integration into teaching. This was important because it would explain the level of experience as well as the motivation they have towards the use of ICT in teaching. The findings of the question are indicated in the figure below.
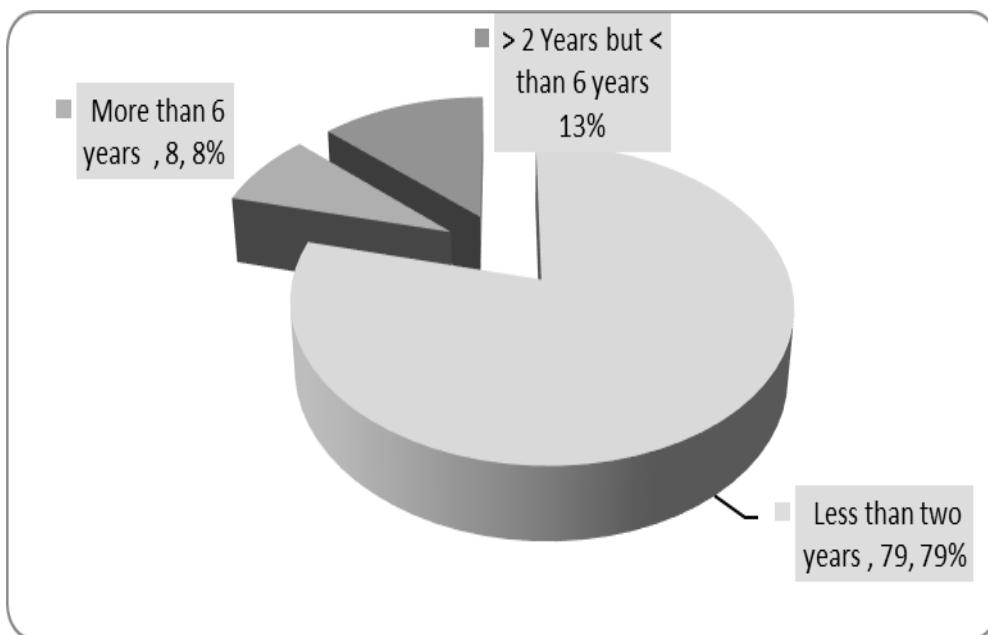
Figure 4.2 Duration Respondents have been Applying Computers and Related Technology

In the figure above, 79% of the respondents had less than two years' experience in using computers and related technology. Some of the respondents (13%) had between two- and six-years' experience while only 8% had more than 6 years' experience The

finding showed that majority (79%) of the teachers had only access to computer for two years, and this short duration of two years could affect the teachers competency in use of ICT hence affect effectiveness in integration of ICT into teaching. The findings concur with the views of Moseley (2010) who felt that the level of teacher's experiences highly affect effectiveness of the integration of ICT in the teaching. This is supported by researcher, as teachers need practice and training in how to apply ICT into teaching. Therefore, the evaluation reveals that level of teacher's experiences has high effect on the integration of ICT in the teaching. The study therefore answered the question on evaluation of effectiveness of experience of the teachers on integration of ICT in the teaching. .

4.4 Evaluation of Teachers' Factors on ICT Pedagogical Skills in Teaching

The first objective sought to evaluate on the effect of teacher's pedagogical skills in the integration of ICT into teaching. The first question in Appendix (A) section B sought to evaluate on the accessibility of computer in the school and integration of ICT in class. It was evaluated to determine whether the respondents 'were applying Computers in various locations and class for the integration of ICT. The result is shown in the figure 4.3 below.

4.4.1 Respondents Access and integration of Computers in Various Locations
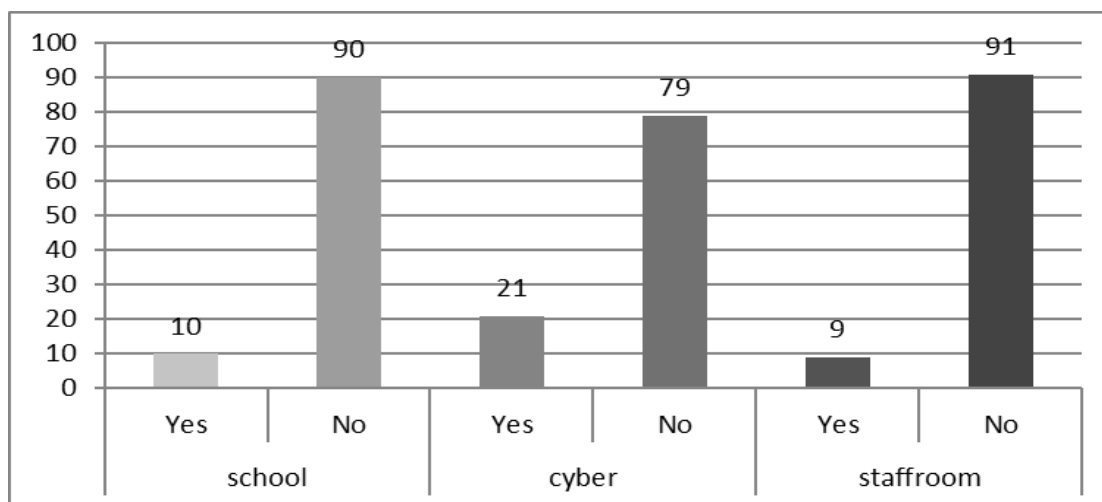
Figure 4.3: Respondents access to computers in various locations

The study established that out of 450 (100 %) only 44 (10%) of the respondents had'

access to computers   in school while, 403 respondents which is (90%) of the

respondents had not accessed the computers   in their schools 47 (, 9%) had accessed

ICT in the staffroom. While 408 (91%) had not accessed to computers in the

staffroom 42 (21%) had accessed in the cyber While 354 (79%) had not accessed

computers in the cyber. From the response only 47 (10%) of the respondents

integrated ICT in teaching and 403 (90%) do not.

From this evaluation, it is noted that few teachers apply ICT in classroom since in

most schools' computers are not made available for use in the staffroom. The study is

in contrast with Wilson (2011) in Turkey who found out that majority of the

respondents who were teachers had access to computers and the internet in schools

and stated percentage as follows. 370 (82.5%) and 364 (81.2%) of faculty members

had access to computers. Plomp and Polgrum& Law (2010) stated that ICT can be

used to improve pedagogical skills if all teachers are trained on how to apply it in

teaching However lack of the ICT equipment could affect the integration of ICT

negatively.

The frequencies of teacher's competencies on instructional tools and materials usage was shown in Figure 4.3. According to the table, the most frequent tools and materials that teachers used are board with 353 (78.7%) of teachers using it and 73 (16.4%) sometimes used it. Besides, teachers also prefer to use printed materials such as books or journals 271 (60.7% often used them and 169 (37.7%) sometimes used them) only 100 teachers integrate ICT into teaching, which is a very low number... The findings of the study support Plomp and Polgrum& Law (2010) who stated that ICT can be used to improve pedagogical skills if all teachers are trained on how to apply it in teaching. This may remove communication barriers from the result obtained. Teacher's pedagogical skill is a teacher factor which influences integration such as that of space and time.

4.4.1 Evaluation of Effect of Methods of Delivering Instruction in ICT lesson

The study also sought to evaluate   the methods of delivering instruction in ICT lesson. The question was important because it illustrates the tools of ICT integration applied by the teachers during instruction.

Table 4.3 Evaluation on ICT Application

Tools of instructions	No. of teachers	Teachers integrating ICT	Percentage (%)
Computers	80	10	2%
Video conferencing	230	-	
Radio	73	18	4%
Television	23	5	1%
Cell phones	34	3	0.6%
TOTAL	**450**	**36**	**7.6%**

From the findings, it is established that 36 out of 450 respondents representing 8.0 % of respondents indicated that they used computers as ICT instruments when teaching in class. Three of them reported that they use cellphone and noted that ICT engages the learner giving them a sense of empowerment. The learners were no longer dependent of the specific and often limited knowledge of their educator. Five respondents indicated using television in ICT to demonstrate to the learners, 18 which were the majority among the teachers indicated that they integrated ICT in their teaching by using a radio. None of the respondents applied ICT when using video conferencing. From the above data, most teachers were not integrating ICT into teaching and majority had no knowledge on how to apply ICT when applying various pedagogical skills, hence pedagogical skill as a teacher factor influences the integration of ICT into teaching.

Only 36 of the teachers representing 8 % who were applying ICT in teaching, recorded the following instruments Radio Television, Handheld devices, Computers,

Tablets and the Internet as some of the ICT instruments used when teaching when integrating ICT in teaching class and learning process. The study established the following skills that influence the integration of ICT into teaching. The user characteristics, content characteristics, technological considerations and organizational capacity are the factors influencing ICT adoption and integration into teaching. From the respondents it was noted that technological, individual, organizational, and institutional factors also affect the integration of ICT into teaching. The study also sought to know the number of teachers who have had training in ICT pedagogical skills in integration of ICT in teaching. The following were the result.

4 5. Evaluation on Effectiveness of Teachers' ICT Competence

4.5.1 Evaluation on the Level of Teacher's Competencies in ICT

The objective sought to evaluate whether teachers 'have skills in ICT integration into teaching in public primary schools. The response was reported in the table below Table 4.4

Table 4.4: Level of Teacher's Competency

Level of teacher's competency	Head Teachers	No of teachers	Percentage
Selection of information relevant to use in ICT integration from intermate	30	25	34.4
Processing information in order to use it to solve pedagogical skills.	35	30	23
Use of internet to motivate learners.	8.	27	14.8
Presence of website and knowing how to use it	01.	30	4.9
Creating new information that arouses curiosity of learners.	9	22	18
Applying traditional methods	5	320	74

From the findings indicated in the table above, most teachers have not been using the ICT in teaching shown by 74% that is 320 teachers out of 450, only 34.4% select information relevant for ICT integration. Processing information to use to solve pedagogical skills, this is done by use of electronic devices and tools that teachers preferred to use, electronic tools to show the teaching material to students, for example showing printed pictures or document via overhead projector or projector system. In addition, teachers also used multimedia computer to show certain materials prepared in PowerPoint slides or from Internet and projected it via projector. On the other hand, the Radio Cassette Recorder and Video Camera are less used compared to others tools and materials with same rate of 77 % teachers never use it. It might be because those tools are no longer popular and have been replaced by Digital Camera or Smartphone with similar functions. The use of internet to motivate learners through use of computers, laptops and smartphones 14.8% of teachers use them while 85.2% do not use them.

The presence of website and knowing how to use it is also important in measuring ICT competence 4.9% have website while 95.1% do not have website. The creation of new information to arouse learner's curiosity through use of ICT 18% know how to create new information while 82% does not.

Besides frequency scores for venue of teachers using ICT in school, I looked for the purpose of teachers using ICT in school to identify the level of primary school teachers' ICT integration in the classroom teaching and learning process. In the same way, Bettino (2003) mentions that the use of ICT in the classroom improves the pupils' performance in the lesson since it improves performance in the teaching, administration, and develop different skills among the leaners.

The findings in table 4.4 showed that the level of ICT competence among the respondents was very low as most of them could not get information from the laptops only 14.8% could use intermate to motivate learners. very few teachers were competent in the integration of the ICT into their class work. Similarly, Bettino (2010) and Sharmala (2010), mention that the use of ICT could improve the process of teaching in the classroom. However, the rate of implementing ICT in teaching continued to be very low due to most teachers not competent in the use of ICT. in their classrooms. Therefore, the study established that teacher competence in the use of ICT affects the integration of ICT into teaching.

4.5.2 Evaluation Whether Respondents had received ICT Training

The questions sought to evaluate whether respondents had received any ICT training. The question was significant to the study as the findings would give information on the rate of the teacher's ICT competence and its influence on the integration of ICT in teaching. The reactions of these respondents are presented in the figure below.
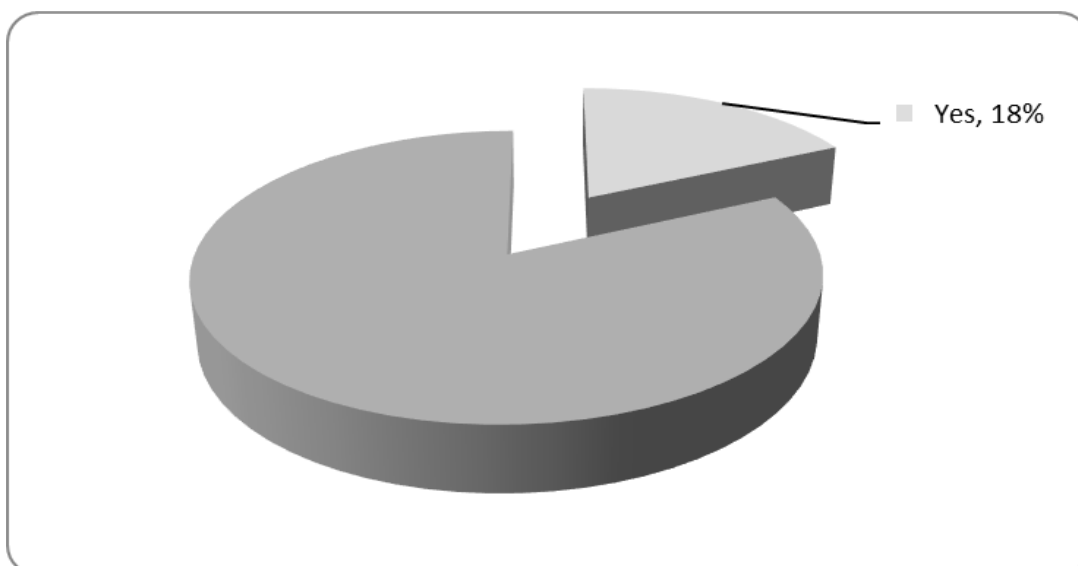
Figure 4.4: Evaluation on Effectiveness ICT Training Received by Respondents

From the figure above, 367 (82%) of them had not received any ICT training . Only 83(18%) had received ICT training According to the research question, the researcher also looked at the training that teachers received to be clearer about the common level of ICT knowledge and its usage. The frequencies of teacher's competencies on instructional tools and materials usage were below average as shown by the high percentage of 367 (82%,) while some of the teachers 83 (18%) were using electronic tools for teaching and learning in some of the lessons and involved those devices as part of their teaching aids.

Based on the figures only 83 (18%) of teachers had received training from Kenya Institute of Curriculum Development (KICD), 367 (82. %) of teachers had not received any training from the Ministry of Education). The finding of the study was in contrast with the findings of Yieldrim (2007) who found that teachers used ICT more frequently for the preparation for hand outs and tests than in teaching From the finding most teachers were not competence enough to integrate ICT into teaching. This competence could be one of the teacher factors influencing the integration of ICT into teaching.

4.5.3 Teachers' Frequency in the use of ICT in Teaching
The question sought to evaluate the teacher's frequency on ICT integration in class by finding out how often do they integrate ICT into teaching as this would affect the

effectiveness of the teacher integration of the ICT into teaching in the schools. The information collected is presented in Figure 4.1.

Table 4.5 Teachers 'Frequency on ICT Integration into Teaching

Rating of ICT integration	Frequency (f)	Percentage (%)
Very often	25	5.3.
Often	50.6	10.6
Rarely	172	36.6.
Never	203	47.4
Total	**450**	**100.0**

From Table 4.1 it is noted that there are only 25 (6%) out of 450 respondents who integrate ICT regularly, 50 (11 %) of the respondents applied ICT often, 50 while 172(38%) rarely integrate ICT into teaching and 123(27%) respondents do not integrate computer in teaching. This finding reveals that most of teachers do not apply ICT into teaching with only 75 (16%) out of the 450 respondents have integrated ICT into teaching.

4.5.4 Rating of Respondents level of Competence in ICT

This question sought to evaluate the teacher's level of competence in ICT because the level of competence would affect the effectiveness of integration of the ICT into teaching in the schools, this will aid in understanding more in their competency in integration of ICT in teaching. In addition to this, teacher's professional development

is a key factor to successful integration of ICT into classroom teaching The findings are shown below in figure 4.7.
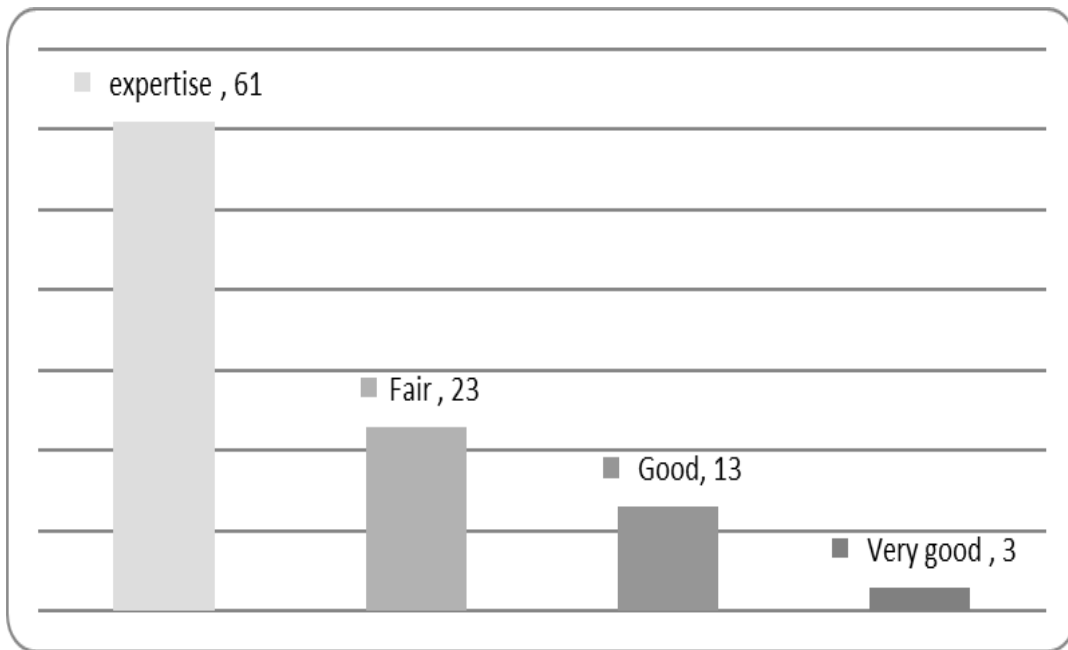
Figure 4.5: Rating of Respondents Level of Expertise in ICT

Findings presented in the figure above, 273 (61%) percent of the respondents had no expertise in ICT use and could not even use a computer at all. Some of the respondents 103 (23%) rated their expertise as fair and could operate basic computer functions and a word processing application. Others 58 (13 %) rated their expertise as good and could use MS Office applications (word processors, Spreadsheets, presentation software) for school assignments, while 16 (3%) rated their expertise as very good and could even use Internet and Internet resources in addition to comfortably using the MS Office applications (word processors, Spreadsheets, presentation software) for school assignments. From the findings, 273 (61%) have no experience at all in application of ICT in teaching, which could influence the integration of ICT into teaching. From the findings, majority of the teachers 273 (61%)have not integrated use of ICT into teaching .This is as a result of lack of training in application of ICT in teaching, the findings concur with Hennesy, Harrison

and Wamakote that the availability of trained teachers is a key strategy for the integration of the ICT technology into teaching. Hence this low teacher competency in ICT could influence low use of ICT integration in teaching.

4.5.5 Evaluation of Respondents' Skills in Various Computer Areas

The question sought to establish the respondents' proficiency in various ICT areas as this could influence teacher integration of ICT into teaching. Thus, the researcher asked the respondents to indicate in the table their levels of proficiency. Responses on this question were illustrated in the figure below.
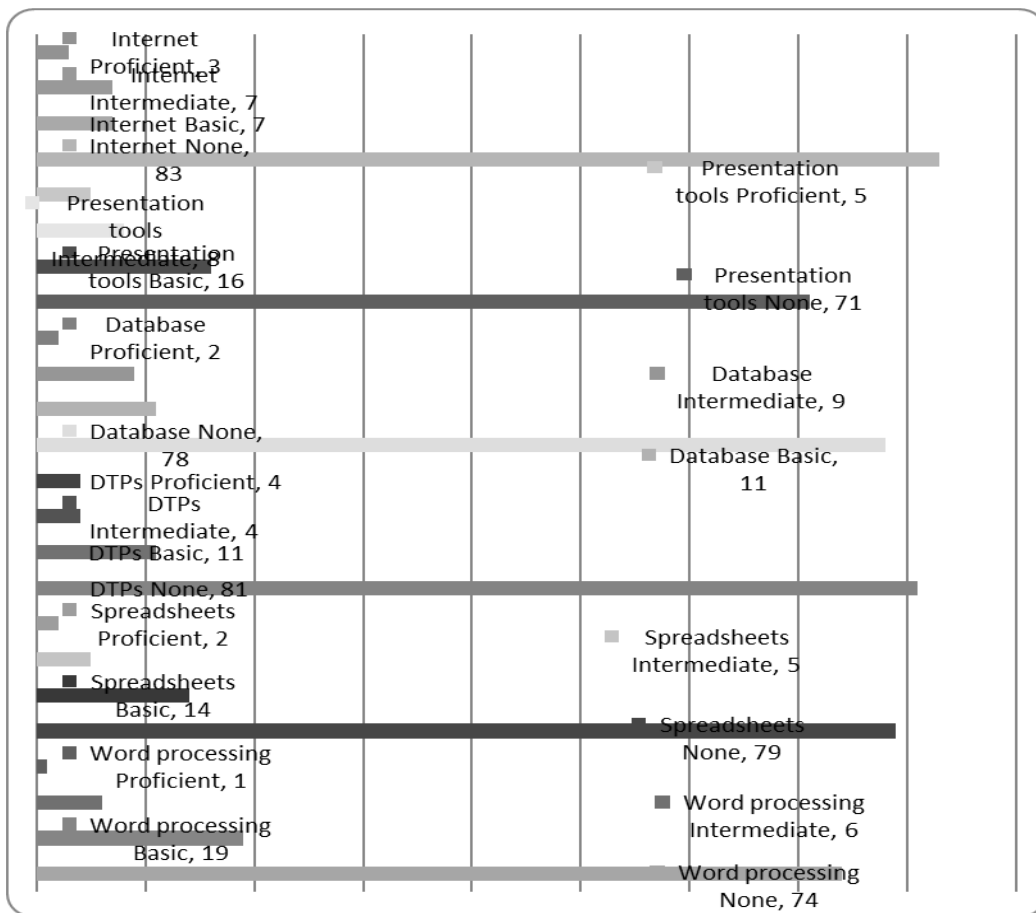
Key; 1; 5

Figure 4.6: Evaluation on the Respondents' Skills in Various Computer Areas

The results   presented in figure 4.6 shows that , 85 (19%) of the respondents possessed basic word processing skills, 72 (16%) were conversant with basic presentation tools, 49 (11%) had basic skills in database 63 (14%) had basic skills in spreadsheets, and 49 (11%) had basic DTPs skills while 31 (7%) had basic internet skills. Only 5 (1%)was proficient in word processing and could not integrate into teaching, 9 (2%) in spreadsheets but had not applied the knowledge into teaching, 9 (2%) in database,   22 (5%) in presentation tools and were integrating ICT into teaching out of the 22 (5 %) who could apply the ICT into teaching , only 13 (3%) could be able to obtain information from the internet. The findings indicate that majority of teachers did not have enough experience in various computer areas as shown by 318 (71%) and only 22 (5%) could apply ICT into teaching. This showed low percentage in competency of the teachers in public primary schools. This could influence the integration of ICT into teaching in public primary schools negatively.

4.5.6 The Evaluation on the number   of teachers Integrating ICT in Teaching

The question sought to evaluate the percentage of teachers applying ICT into teaching. The study established the following as presented below. It was important to establish whether the teachers are applying ICT into teaching in public primary schools. Responses on this question are indicated figure 4.7 below.
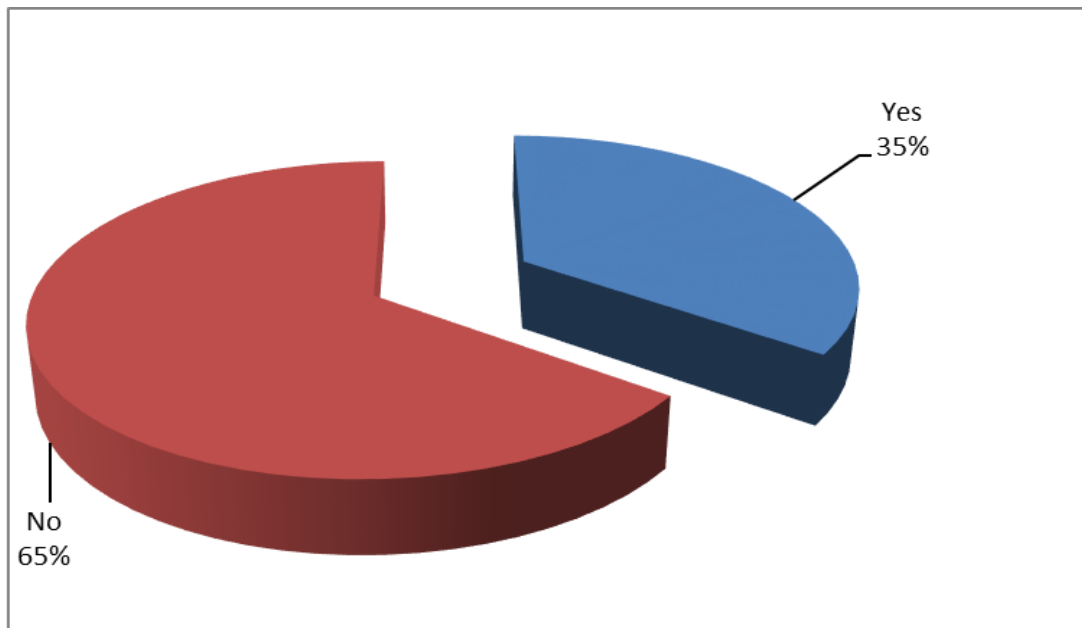
Figure 4.7: The Evaluation on number of teachers' Integration ICT in Teaching

The results presented in figure 4.7, show that 306 (68%) out of 450 respondents indicated that they were not applying ICT into teaching while minority 144 (32%) of the participants explained that they were currently using the ICT program in their teaching. From the findings, majority of the teachers are not integrating ICT into the teaching due to not being competent in the application of ICT in public primary schools. This indicates low rate of competency which could be one of the teacher factors influencing the integration of ICT into teaching. These findings disagree with the findings of the study conducted by Tay (2012) who established that ICT has become part of teaching methodology as they are interacting with the applications of information and communication technologies and its impact on learning achievements would affect the integration of the program. However, the findings are similar to Mishra and Koehler (2011) who discovered that most of the teachers do not use ICT in their schools. Therefore, the number of, teachers integrating' ICT was minimal as most teacher had limited skills in use of ICT into teaching process.

4.6 Evaluation of Teachers' Knowledge in Integration of ICT in Teaching.

The question sought to evaluate on how teacher's knowledge on the application of ICT learning resources as this could affect effectiveness of the integration of ICT into teaching in public primary schools in Nairobi County. Just as Siddiqui (2004) believes that ICT integrated resources can be adopted according to the requirement of students, which help teacher educators to apply appropriate methodology for effective learning. First of all the respondents were requested to indicate if they had any ICT resources in their school and the responses were depicted in the figure below.
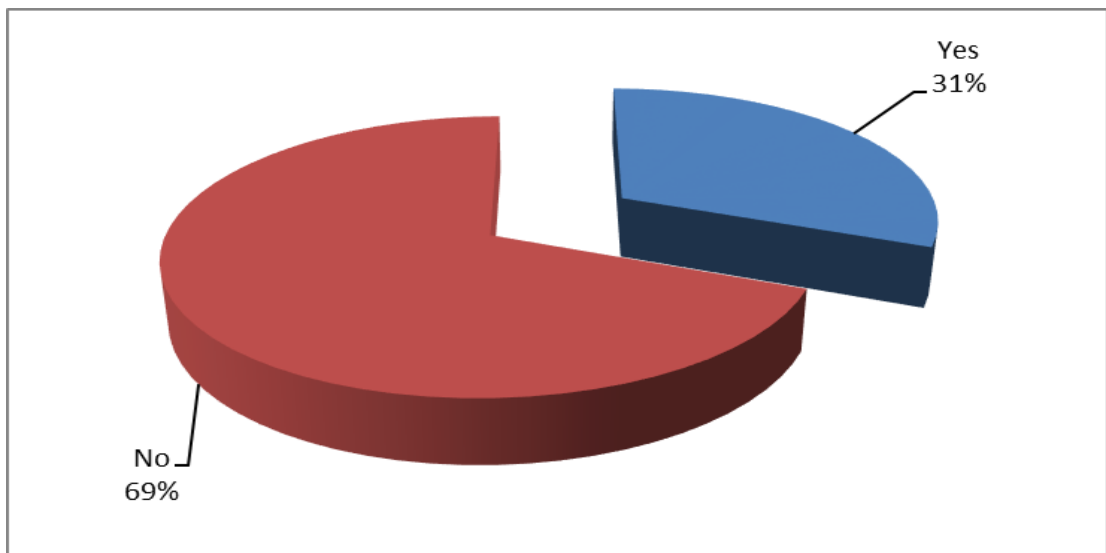
Figure 4.8 Applications of ICT Learning Resources

From the Figure above, 309 (69%) percent of the respondents indicated that they did not have enough ICT books and equipment in their schools, while 141 (31%) indicated that they had enough ICT books and ICT equipment in their schools. The findings indicate that the learning resources were not adequate for the teachers to use them in schools this is shown by, 309 (69%) of teachers which could influence the integration of ICT in primary schools in Nairobi.

The results, therefore, supports the findings of studies by Preston and Cox (2013) that effective integration of ICT into teaching in schools depends mainly on the availability and accessibility of ICT resources such as hardware and software. They further found that, if teachers are not knowledgeable in ICT equipment, then they cannot access ICT resources, then they will not use them, which influences teacher integration of ICT into classes.

This is reasonable and supported by data from figure 4. Some 141 (31%) of respondents said that they are not using Internet in the computer lab with their students. It is because most of the schools are conducting a computer lessons by computer instructors employed by the school, and these are not included as research respondents from the findings one may say that most teachers do not have enough knowledge in using the ICT equipment's, which may influence teacher integration of ICT into teaching.

4.6.1. Availability of ICT Resources in Respondents' Schools

The respondents were requested to indicate the availability of ICT resources in their schools. The responses are presented in the table below.

Table 4.6 : Evaluation on availability of ICT Resources in Respondents' Schools.

Available ICT resources	No of ICT in schools	No of schools	Percentage
Tablets	20	62	34%
Desk tops	15	62	25%
Projector	05	62	8%
Computer lab	03	62	5%
Total	43	248	100

Source 2018

The study established that only152 (34%) of the sampled schools had tablets, 112 (25%) had desk tops in schools, 36 (8%) had projectors, ICT resources like computer Lab data logging tools were lacking in the respondent's schools. This is in similar view with findings by Ralston (2010) who found that statutory tests in core subjects at ages 7, 11, 13 involve no use of ICT. From the findings only 4 (1%) of the respondents had enough resources which could be used to integrate ICT in schools. were applying, 426 (95%) of the teachers had no enough knowledge or access to the equipment for integration of ICT into teaching therefore majority 426 (95%) were not competent in the application of ICT. Hence lack of resources could affect the effectiveness of teachers' integration of ICT.

4.7 Evaluation on the effect of Teachers Attitude towards Integration of ICT

The third objective sought to evaluate the effect of teachers' attitude towards the integration of ICT into teaching, the first question was intended to evaluate the respondent's interest on application of ICT into teaching in public primary schools by indicating their answer as below;.
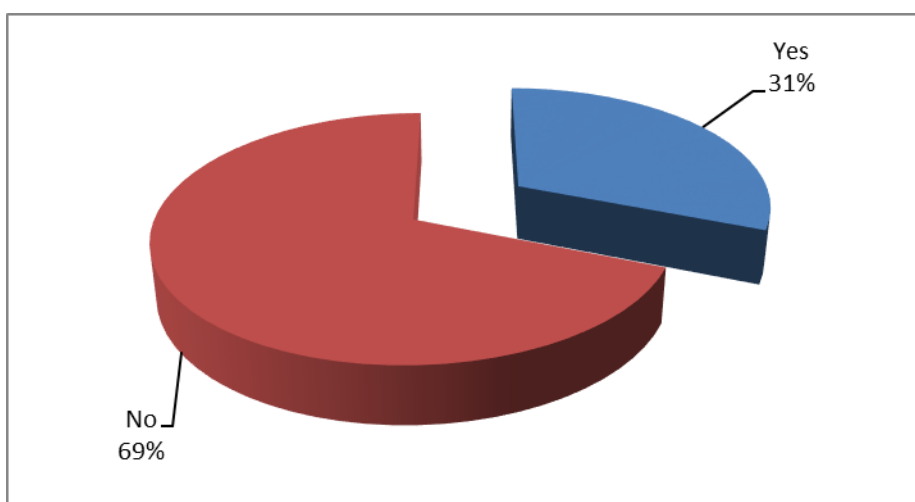
Figure 4.9: Whether Teacher's have Interest in applying ICT in their Teaching

From the findings, 309 (69%) of the respondents indicated that they were not integrating ICT into teaching and had no intention of using ICT in their teaching while 141 (31%) indicated that they had positive attitude and were applying ICT in teaching and had intention of acquiring further knowledge in Integration of ICT in their teaching.The researcher suggested that, the school management should try as much as possible to support the teachers because anything contrary to this would automatically put off the teachers from using ICTs. From the finding a number of teachers have a negative attitude towards integration of ICT which affect the effectiveness of integration of ICT into teaching.'

4.7.1 Evaluation on Teachers' Attitude on ICT usage in Primary School

The question sought to evaluate whether teacher's attitude towards ICT application in their schools, and the following were looked into; Teachers' technology competence, school culture, access to ICT, school support, and years of classroom teaching experience are some of the factors that determine Teacher's attitude on ICT usage in Primary School. Thus, the researcher needed to determine how attitude portrayed by teachers who integrate ICT in Primary School. The responses are indicated below.
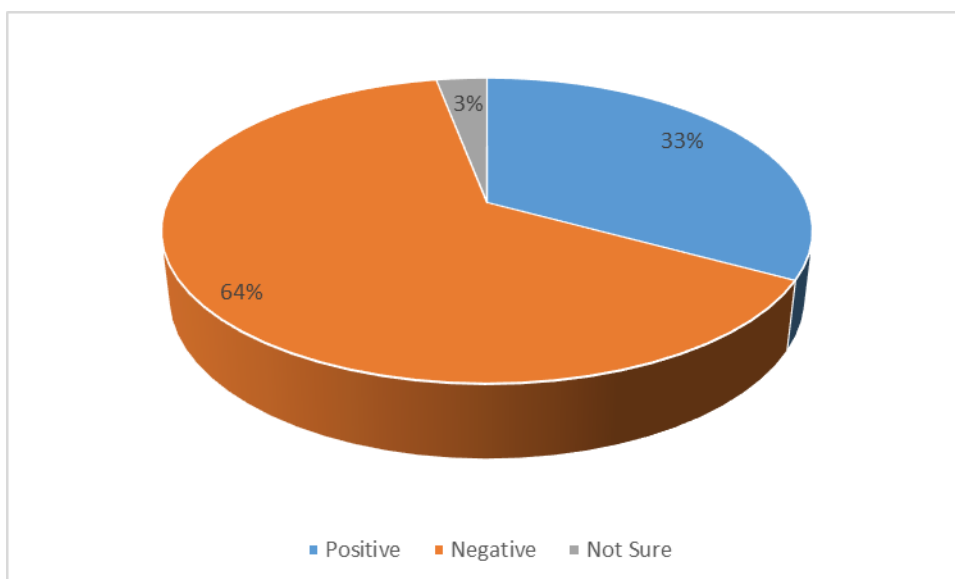
Figure 4.10 Evaluation of Teachers' Attitude in ICT Usage in Primary School

From the findings 66% (300) of the respondents indicated that teacher's attitude towards ICT was negative while 141 (31%) indicated that the teacher's attitude was positive 9(2%) did not respond to the question The findings are in line with literature review where Kula (2010) found out in his study on teachers attitude and its effects in ICT that majority of the teacher in the primary level have a negative perception towards implementing ICT in their teaching program. The participants were asked whether the teachers are currently applying ICT into teaching and adequately integrating into teaching. Most participants 300 (66%) of teachers felt ICT was not necessary while 141 (31%) of the teachers did incorporate ICT when preparing for their lessons. Hence, teachers are not incorporating ICT into teaching in their lessons adequately.

4.7.2 Evaluation on the Enhancement of ICT Application in Teaching

In the same way, the researcher needed to evaluate the extent to which the respondents agreed with statements on ICT integration in teaching and the responses are indicated in the table below.

Table 4.7 Evaluation of teachers' Attitude towards integration of ICT in Teaching

	.... disagree	Disagree	Neutral	Agree	.... agree	Mean	Stdev
There is increased use of micro-soft office applications	16.4	41.2	24.2	13.2	4.2	3.5	1.04
Increased use of instructional materials such as the internet	7.2	17.8	36.2	36.8	1.0	2.9	0.94
ICT would improve the presentation of work in class	17.8	41.2	22.8	13.8	3.4	3.5	1.04
Pupils use of technology Enhances learning	32.4	47.2	8.2	4.4	6.8	3.9	1.09
Use internet (online learning) enhance learning	13.	22.0	35.8	27.2	0.6	3.2	1.01
ICT Improve productivity in teaching	13.3	49.4	21.6	7.6	8.2	3.5	1.08

Findings revealed that respondents were in disagreement that there was increased use of micro-soft office applications as shown by a mean of 3.5 and a standard deviation of 1.04; that there was no increase in instructional materials in the internet as shown

by a mean of 2.9 and a standard deviation of 0.94. ICT would not improve the presentation of work in class as shown by a mean of 3.5 and a standard deviation of 1.04. Pupils did not use multimedia technology as shown by a mean of 3.9 and a standard deviation of 1.09. Provision of professional support through the internet (online learning) as shown by a mean of 3.2 and a standard deviation of 1.01. There was no improvement in productivity due to ICT integration as shown by a mean of 3.5 and a standard deviation of 1.08. 65% of teachers felt it had not while 35% felt it did not incorporate ICT when preparing for their lessons. The findings are in contrast Rozell and Gardner (2010) who discovered that teachers' computer experience relates positively to computer attitudes. However, a study conducted by Tedla 2011 gives similar findings that effective use of computers in classroom by teachers depends on personal beliefs and attitudes of teachers towards ICT. From this analysis, teacher's attitude hinders effectiveness of teacher integration of ICT into teaching.

4.8 Evaluation on Teachers' Knowledge in ICT Integration

The question sort to evaluate the teacher's knowledge on ICT integration and their attitude towards ICT integration through the interview. The respondents recorded that, support from administrators, directives to teachers to use ICT, appropriate ICT skills and knowledge as well as adequate resources were important factors that affect the effectiveness of the utilization of ICT in the classroom. Furthermore, insufficient technical support discouraged teachers from using ICT in teaching, while increasing adequate equipment and technical support in schools encouraged teachers in this respect. Most of the respondents noted that it is true the teacher's attitude in the ICT application does influence its integration. Teachers 'attitude in the application ICT in schools can be improved by ensuring that technology works best as a supporting tool-making complex processes or creative experience either possible or easier to

accomplish. Other respondents noted that technology can offer new ways to provide meaningful, real-life context for learning, it also allow students to collaborate with peers and experts across the country and around the World. Therefore, the school administration must ensure they offer the services needed for the full integration of ICT in schools.

4.9 Evaluation of the Effectiveness of respondent's integration according to Gender

The objective sought to evaluate whether the gender of the respondent's factor effects on ICT integration in teaching in public primary schools.
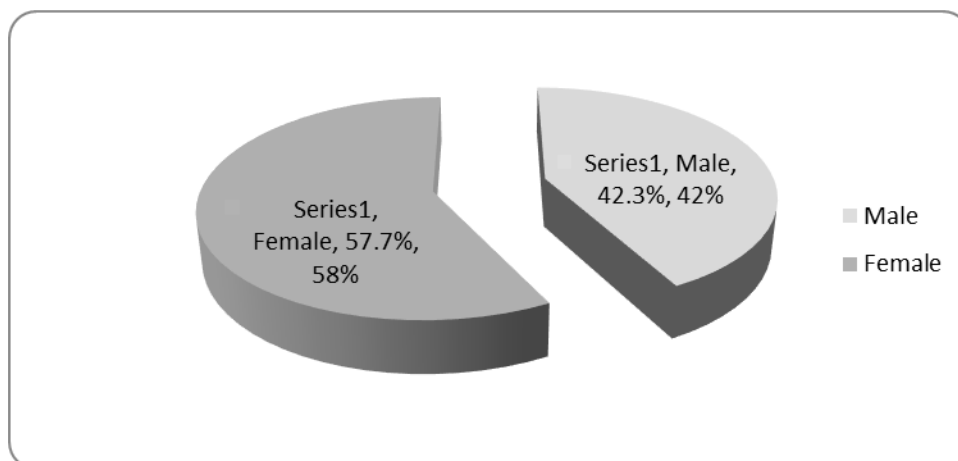
Figure 4.11 Gender of Respondents

The results on gender presented in figure 4.11 shows that majority of the respondents 395 representing 88% of the respondents were female and 55 (12%) were males. It was also noted that 26 (53%) the head teachers, were female and the other 29 (47%) were male. The results clearly show that there were more female than male in teaching profession. This implies that majority of the teachers in primary schools in the city were female and they were also ready to respond to the questionnaire.

However, majority of male 50% were applying ICT in teaching compared with the female who only 10% were using ICT in teaching. This was necessary for the researcher to establish whether the gender influences the integration of ICT in primary schools whether respondents had received any ICT training before application of ICT.

The question intended to assess whether gender was a factor in integrating ICT into teaching. The response was shown in the figure below
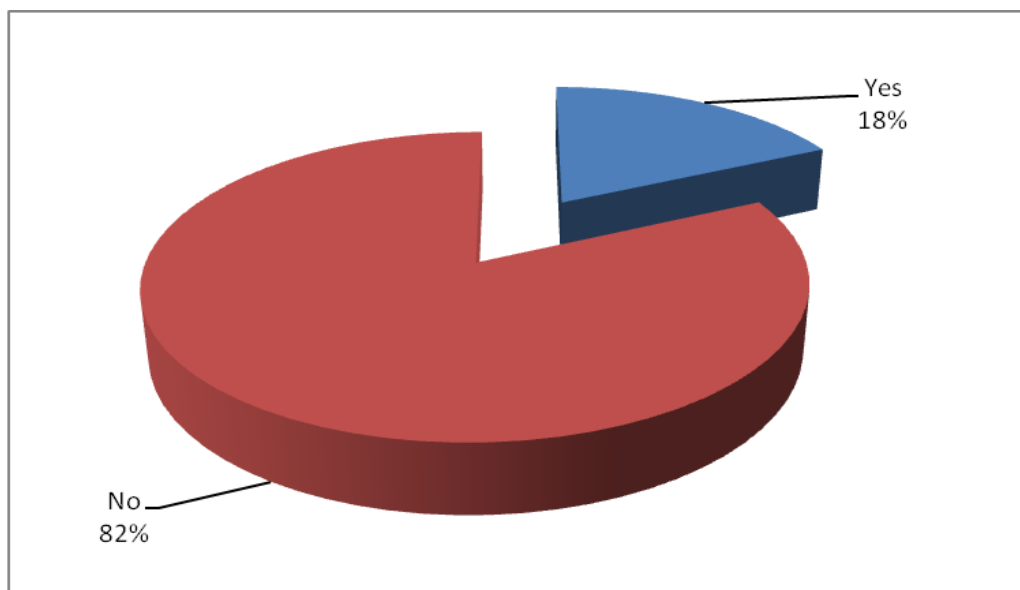
Figure 4.12: Evaluation on Effectiveness of Application of ICT by Gender

From the results it is noted that there were more male (82%) teachers applying ICT in the teaching compared to their female counterparts. The finding support, AfsharI (2009) who in his study concluded that professional development is necessary for teachers to enable them to effectively use technology. The study further established that female teachers seem to have a negative attitude towards the integration of ICT into teaching, which could influence integration in primary level as compared to male. Although fewer male participated in the study but it was noted that more male were using technology than female in their teaching.

4.9.1 Gender in Computer Application

The researcher sought to evaluate on whether each gender own and apply computers in teaching   processes. The responses are summarized in Figure 4.3
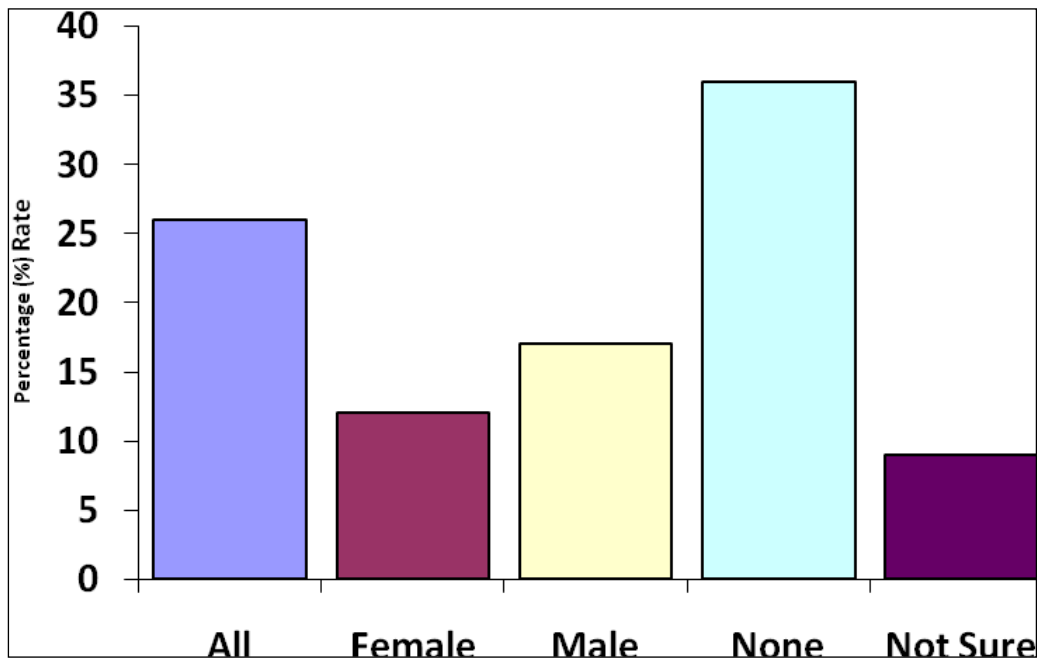
Figure 4.13: Gender in Computer ownership and Application

The results presented in figure 4.13 show that majority of the respondents 162 (36%) indicated that none of the teachers female or male owned or used their own computers in teaching. These findings concurred with Semenov (2005) who established that both male and female teachers did adopt and used technology to enhance their teaching hence reduced the gender digital gap. On the other hand, 116 (26%) of the respondents indicated that both male and female, owned and used computers; and 54 (12%) indicated that females owned computers; 76 (17%) indicated that males' own computers, while 42 (9%) was not sure.

The results also support the findings of Omollo, Indoshi and Ayere (2014) established that male teachers had a positive attitude toward ICT use than female teachers. As

indicated by 76% of the respondents. Besides, the findings are in agreement with Gode, Obegi and Macharia (2014) who cited male teachers as the gender that held favorable attitude towards usage of computers than female teachers.

The findings of the evaluation indicated that the rate at which female teachers use ICT in school to prepare lessons or for personal activities was very low compared with male teachers. This study further concurs with Guoyuan (2011) and Birgit (2015) who found that female teachers can hardly pursue ICT in education as their core career unlike male teachers. This study established that only a few females integrate ICT into teaching than the male counter parts, hence gender factor in teaching hinders effectiveness of the teacher's integration of ICT into teaching. It is generally observed that male were better in adopting and using technology in their teaching compared to the female teachers .

4.9.2 Evaluation of Head teachers' Response on the Integration of ICT by the Teachers in their Schools

The study sought to evaluate through the interview, the headteachers view on the teacher factors on the ICT integration, A few head teachers (20%) responded that the level of ICT integration by teachers   was satisfactory. However, many head teachers (80%) held a view that the integration was low. When asked about the support they provided to their teachers in order to integrate ICT in their classrooms. 52 varying responses were given. However, the overriding response from these head teachers showed that they tried to provide assistance in terms of buying computers for the teachers to use. A number of head teachers, 50% (30) reported that they had bought computers for the schools, while 25% (15) reported that they borrowed or organized for computers to be brought to the schools to be used by the teachers. Other support

that is given includes financial support to buy the needed accessories such educational DVDs they felt that the few resources could influence the integration of ICT into teaching.

4.9.3 Head teachers Response on the Challenges and Suggestions in ICT Integration

When the headteachers were asked the challenges that they face and the suggestion of improving ICT integration in the teaching, nearly all the head teachers reported that the biggest challenge they faced was lack of facilities, in particular computers. In addition to, the head teachers reported that lack of networking of the computer system was a big challenge they also faced. Other challenges that were reported included inadequate teachers with ICT skills, lack of support from the ministry and high maintenance costs. Power blackouts and interruptions were also noted as a major challenge facing the head teachers.

On suggestions to improve the integration of ICT in schools, 30 of the head teachers suggested that the ministry of education should develop an ICT training program for teachers so that they are well equipped in this area. This would as well help in bridging the gap that exists among teachers. Similarly, several head teachers suggested that KICD should broaden the present curriculum to include computer lessons in primary schools. Another suggestion was that the government ought to offer subsidizes on computer accessories for schools as it was costly buying them. In addition, it was as well suggested that the ministry of education should post computer teachers in primary schools, as currently this is not being done. Hence more need for ICT skills for effective integration of ICT into primary teaching.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this Chapter the Researcher discussed Summary of the Study, Conclusion, Recommendations and Suggestions for Further Research.

5.2 Summary of the Study

Information communication technology is perceived as a major catalyst for change in teaching styles, learning approaches and in accessing of information. It involves application of electronics in the teaching. Most countries have integrated use of ICT in teaching worldwide. In Kenya the government has supplied ICT equipment to primary schools. However, only few schools integrate ICT into teaching. This study looked at effect of teachers' factors on the integration of ICT and the findings are presented.

The study found that, many of the teachers in the sampled schools had not integrated ICT into teaching because of various teacher factors. From the results, the study established that younger teachers were more ready to use ICT as opposed to older teachers, thereby underlining the fact that age was one of the teacher factors hindering effective integration of ICT in teaching among teachers. However, on the basis of gender, there was significant relationship established between gender and ICT integration. The evaluation established that, majority of male 358 (80%) were applying ICT in teaching compared with the female teachers who only 45 (10%) were integrating ICT into teaching. Similar findings established in academic qualification indicated that the number of years in teaching did have effect on the integration of ICT into teaching. On comparison, the evaluation result agrees with Rimyan (2006)

who argued that young teachers perceived use of Instructional Technologies as more suitable unlike senior teachers who viewed technology as difficult to use. From the evaluation one can deduce that age was one of the teacher factors which affected effective integration of ICT into teaching. The majority of teachers who were in their fifties found it difficult to integrate ICT into teaching unlike their younger counterparts.

The study found out that age, gender, academic qualification, years of experience were not the only factors that determine the integration of ICT into teaching. There were other factors that affected teacher integration of ICT in teaching. The factors such as student's attitudes, support from the head teachers (school) and number of teachers trained in ICT. In addition, the evaluation study found that teachers and the head teachers have a negative attitude towards integration of ICT in the teaching. These findings negate those of TayLW (2011) who established that teachers and head teachers understand the important of ICT in improving teaching at schools Tayi (2011) as well found that teachers had a positive attitude towards integration of ICT into teaching.

The study found out that the teachers' pedagogical skills in the integration of ICT in teaching. That 91% of the respondents had no access to computers and internet in their staffrooms, and were using text books for teaching. 9% of the respondents had ICT in schools and were integrating it into teaching; however the teachers were not conversant of ICT method of delivery into classroom hence they were using as a reference for information instead of integrating it into teaching. Hence need for more training on ICT pedagogical skills in schools and supply of enough ICT equipments.to enhance effective integration of ICT. The majority of the respondents said lack of

training materials was common among schools which made it very difficult for them to help in the integration of ICT in Kenya. For any school to implement ICT easily there was need for ICT training materials without which, it was practically impossible to integrate ICT effectively in schools. Therefore, many respondents said that lack of training materials hinders teachers from integrating ICT effectively into teaching hence pedagogical skills is one of the teacher factors hindering effective integration of ICT.

The evaluation questions on methodology establish that, the questions and answers method was the most favorable for the respondents integrating ICT into teaching. Majority of the respondents were not integrating ICT into teaching during lecture method hence need for teachers to be trained in application of ICT pedagogical skills as shown by the low percentage of teachers integrating ICT.

The present results support arguments by researchers that follow-up professional growth programs and mentoring systems are necessary after and during technology integration in order to foster collaboration and support address. The daily challenges, and ultimately increase effective ICT Integration into teaching the study established that pedagogical skills was one of the teacher factors affecting integration of ICT into learning.

Based on the findings, this study established that training of teachers in ICT was essential. The majority (70.5%) of the respondents agreed that pre-service and in-service training of teachers can aid effective teachers' integration of ICT into teaching. The study also found out that, 82% of respondents had not received any ICT training before. Only 18% had received ICT training, sixty one (61%) percent of the respondents had no expertise in ICT use and could not even use a computer at all.(

23%) rated their expertise as fair and could operate basic computer functions and a word processing application, (13%) rated their expertise as good and could use MS Office applications (word processors, spreadsheets, presentation software) for school assignments, while 3% rated their expertise as very good and could even use internet and Internet resources in teaching for school assignments; 19% Of the respondents possessed basic word processing skills, 16% were conversant with basic presentation tools, 11% had basic skills in database, 14% had basic skills in spreadsheets, and 11% had basic skills while 7% had basic internet skills from this one concludes that there was need for training of teachers to improve skills in integration of ICT hence teacher competent is one of teacher factors hindering effective integration of ICT in teaching.

It is further revealed that only 1% was proficient in word processing, 2% in spreadsheets, 4% in DTPs, 2% in database, 5% in presentation tools and only 3% in internet; that teachers demonstrated deficiency in understanding of ICT operations and concepts as shown by a mean of 3.5 and a standard deviation of 1.04; teachers demonstrated lack of interest in continual growth of technology knowledge so as to stay abreast of current and emerging technologies as shown by a mean of 2.9 and a standard deviation of 0.94; teachers also lacked design learning strategies that use ICT to support the diverse needs of learners as indicated by a mean of 3.5 and a standard deviation of 1.04; teachers failed to apply current research on teaching and learning with ICT when planning learning environment as shown by a mean of 3.9 and a standard deviation of 1.09; teachers could not identify and locate technology resources suitable for meeting learning objectives as shown by a mean of 3.2 and a standard deviation of 1.01; teachers had not planned student learning in a technology enhanced context as shown by a mean of 3.3 and a standard deviation of 1.21; there was no management and care of ICT resource in respondent's institutions as shown

by a mean of 4.2 and a standard deviation of 0.80; teachers did not use a technology resource to engage in ongoing professional development and lifelong learning as shown by a mean of 3.9 and a standard deviation of 0.86; teachers did not use technology to collaborate with peer and stakeholders as shown by a mean of 3.5 and a standard deviation of 1.08.

The study found out that Teachers did not reflect on professional practice to make informed decisions regarding use of technology for teaching as shown by a mean of 4.1 and a standard deviation of 0.83; teachers did not identify and use technology resource that affirm diversity as shown by a mean of 3.5 and a standard deviation of 1.08. The knowledge that teachers had about the scope of ICT Resources were influenced by their own ICT competence. For example, those teachers who professed not to have significant experience in using spreadsheets tended to focus on pupils using presentation software to promote Class discussion. In such instances the ICT activity Centered on presenting knowledge rather than exploring new concepts and processes. As suggested by the Evidence from the literature review, this meant that in some cases pupils' teaching concentrated on multimedia Skills rather than subject knowledge.

The study found out that 69% of the respondents indicated that teachers were not using ICT in their teaching while 31% indicated intention of using ICT in their teaching. The study also found out that 64% of the respondents indicated that teacher's attitude was negative while 33% indicated that the teacher's attitude was positive. The study findings also revealed that teachers have negative attitudes toward technology, providing them with excellent ICT facilities may not influence them to use it in their teaching as shown by a mean of 3.1 and a standard deviation of 1.10;

teachers need to be assured that technology can make their teaching interesting, easier, more fun for them and students, more motivating and more enjoyable as shown by a mean of 3.6 and a standard deviation of 1.10.

The study also noted that ICTs is an important component in the process of teaching as shown by a mean of 4.1 and a standard deviation of 0.84 and that the school should always boost the attitude of teachers towards ICT by creating a conducive environment for ICT learning. as shown by a mean of 4.1and a standard deviation of 0.73.on of work in class as shown by a mean of 3.5 and a standard deviation of 1.04; that students did not use multimedia technology as shown by a mean of 3.9 and a standard deviation of 1.09; Majority of respondents had neither accessed computers nor internet in their staffrooms, school, nor in cyber. They had also not received any ICT training before. They lacked expertise in ICT use and could not even use a computer at all, a few could operate basic computer functions and a word processing application, some could use MS Office applications (word processors, Spreadsheets, presentation software) for school assignments, while very few could use Internet and Internet resources.

The evaluation revealed the deficiency in understanding of ICT operations and concepts; among teachers. They demonstrated lack of interest in continual growth of technology knowledge so as to stay abreast of current and emerging technologies. Teachers also lacked design learning strategies that use ICT to support the diverse needs of learners; teachers failed to apply current research on teaching and learning with ICT when planning learning environment; teachers could not identify and locate technology resources suitable for meeting learning objectives; teachers had not planned student learning in a technology enhanced context; there was no management

and care of ICT resource in respondent's institutions; teachers did not use a technology resource to engage in ongoing professional development and lifelong learning; teachers did not use.

The study was also aimed at evaluating the extent to which, teachers gender relationship affects integration of ICT in teaching. From the findings, 26% of the respondents indicated that both male and female teachers do not access and use computers while 36% cited that neither male nor female teachers accessed and used computers in teaching and learning. The respondents gave general opinions on ways of effectively improving adoption and use of ICT by male and female teachers. The respondents cited training of all teachers on ICT integration as the most effective way of promoting use of ICT in the classroom activities. Another group of respondents in the study suggested that teachers of different genders should be given equal opportunities in ICT and motivate them with monetary rewards and certification. The incorporation of ICT in the mainstream curriculum and creation of public awareness on significance of ICT in teaching were the common response given. Generally, the respondents cited that purchasing computers for schools can actually promote the access and use of ICT. The result also reveals that the male teachers were integrating ICT than the female teachers hence gender as a teacher factor affects effective teacher integration of ICT.

5.4 Conclusions of the Study

The Study concludes that ,a large number of teachers did not have access to computers to aid the teaching process and this consequently imply that they did not have access to the internet, the study therefore established that,the integration is affected largely by inaccessibility of requisite ICT infrastructure. Given that

curriculum delivery was mostly done in classrooms, one would be justified to say that computer related technologies were, to a large extent not aiding curriculum delivery in the primary schools and teachers lacked that exposure on integration of ICT. The study concluded that ICT resources were lacking to aid the integration of ICT into teaching and that ICT resources influenced integration of ICT into teaching;

The study also concluded that, there was limited use of micro-soft office applications in teaching; and no increase in instructional materials in the internet; for the ICT to improve the presentation of work in classrooms. Teachers hardly use multimedia technology; that provision of professional support through the internet (online learning); and that there was no improvement in productivity due to lack of ICT integration

The findings on Gender, revealed low number of females integrating ICT in teaching than the male counterpart. However, all the evidence showed, that these benefits were Dependent on the way in which the teacher select and Organized the ICT resources, and how this use is integrated into other activities in the classroom and beyond. The crucial component remains the teachers' competence, their pedagogical approaches and the attitude.

5.5 Recommendations of the Study

From the findings, the study recommended the following, that;

i. The Ministry of Education should ensure that the objectives of ICT in education are achieved through preparation of sufficient and up-to-date tested ICT infrastructure and equipment to all educational institutions. In addition,

ICT should be integrated during regular classroom instruction and trainers should demonstrate to the trainee's innovative ways of teaching and learning

ii. There is need to encourage both Gender to acquire training in the integration of ICT for effective integration of ICT into teaching.

iii. The government should provide teachers with regular trainings and seminars on how to integrate ICT in the teaching and learning process this will aid teacher's confidence and motivate them on application of ICT in teaching. .

5.6 Suggestions for Further Research

Based on the present study, the researcher has made the following suggestions for consideration for further studies.

i. Further studies should be carried out in private schools to determine whether similar result could be obtained.

ii. Further studies can as well be carried out in secondary schools to determine if the teacher factors like age, gender, academic qualifications and the period they have been teaching influence the integration of ICT in Kenya.

iii. This study was only limited to Nairobi county, further studies need to be carried out in other parts of the country. However, changes in sampling, data collection methods can be considered when carrying out these studies.

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APPENDIX I: QUESTIONNAIRE FOR TEACHERS

This questionnaire aims at getting your opinion on the Influence of Teacher Factors on integration of Information Technology into teaching in public primary schools' in Nairobi County, Kenya. You do not have to write your names as your identity will remain confidential. Please be free to give your opinion in the response. Answer all the questions by indicating your choice by a tick where appropriate or fill in the blank spaces.

SECTION A: BACKGROUND INFORMATION

1. How old are you? Under 30 years ☐ 50 years. ☐ Over 50 years ☐

2. Indicate your qualification.

☐ PhD ☐ Master's ☐ Degree ☐ Diploma ☐ Certificate

3. How many years have you been using computers and related technology?

☐ Less than two years ☐ More than two years but less than 6 years

More than 6 years ☐

none ☐

Section B: ICT PEDAGOGICAL SKILLS

5] Please indicate whether you have access to computers and internet in the following locations

A] in school   b] in cyber   c] in staffroom

6). The following methods are related to pedagogical skills in the integration of ICT in teaching

Indicate the method you use in the box below

	Yes	No
Observation method		
Lecture method		
Question and answer method		

Discussion method

(b)

……………………………………………………………………………………

7 (a) Explain any ICT training that you have undertaken in the pedagogical skills in integration of ICT in teaching?

……………………………………………………………………………………
……………………………………………………………………………………
……………………………………………………………………………………

SECTION C: TEACHERS ICT COMPETENCE

7. How would you rate your level of competence in ICT use?

Level of teachers' competence in ICT

Tick the one that applies	Level of competence
	I use computer as a tool for demonstration working with presentations, I have made myself (e.g Power Point)
	I use computers as tool for demonstration working with existing presentations, or those someone else has made for me
	I use computers as a tool to teach new subject knowledge ie the pupils acquire knowledge directly from the computer

	I use educational software with my students for learning subject knowledge through drill and practice. -I encourage pupils in class to search for relevant information on the internet -I ask my students to undertake tasks or follow up class work at home on the computer -I teach my students to consider the implications and opportunities of computer use.

8. Have you received any ICT training?

…………………………………………………………………………………

How frequent do you intergrate ICT tools into teaching? Indicate in the table below

Rating of ICT integration	Frequency	Percentage		
Very often				
Often				
Rarely				
Never				

10. How reqularly do you use ICT tools in preparation and presentation of lessons,

   Very often

   Often

   Rarely

   Never

11   How would you rate your level of expertise in ICT use?

   Tick the one that applies

Tick the one that applies	Level of Expertise
	NO EXPERTISE – Cannot use computers at all.
	FAIR – Able to operate basic computer functions and a word processing application.
	GOOD – Able to use Office applications (word processors, Spreadsheets, presentation software) for school assignments.
	VERY GOOD – All the above skills including use of Internet and Internet resources

12 The Following are some of the proposed ICT related skills that should be emphasized in ICT integration.

	None	Basic	Intermediate	Proficient
Word processing				
Spreadsheets				
DTPs				
Database				
Presentation tools				
Internet				

According to you, how would you agree on them on a scale of 1 to 5 where 1 is strongly disagree and 5 is strongly agree in their relation to primary teacher adoption of ICT in teaching.

			3	2	1
I.	a.	Teachers Demonstrate sound understanding of ICT operations and concepts			
	b.	Teachers Demonstrate interest in continual growth of technology knowledge so as to stay abreast of current and emerging technologies.			
II.	a.	Teacher Design learning strategies that use ICT to support the diverse needs of learners.			
	b.	Teachers apply current research on teaching and learning with ICT when planning learning environment.			
	c	Teachers identify and locate technology resources suitable for meeting learning objectives.			
	d	Teachers Plan student learning in a technology enhanced context.			
	e	There is Management and care of ICT resource in my institution			
III.	a.	Teachers Use a technology resource to engage in ongoing professional development and lifelong learning			
	b.	Teachers Use technology to collaborate with peer and stakeholders.			
	c.	Teachers Reflect on professional practice to make informed decisions regarding use of technology for teaching /learning			
IV.	a.	Teachers Identify and use technology resource that affirm diversity			

13. Do you think that the current ICT teacher education curriculum has prepared you adequately to integrate ICT issues in the school?

(   ) Yes   (   ) No

……………………………………………………………………………………
……………………………………………………………………………………

…………………………………………………………………………………………………
………………………How do you use computer in the following areas with your students

Purpose	Very often	Often	Rarely	Never
Learning Specific Subjects				
Teaching Computer Skills				
Doing Experiments and assignment				
Finding and Accessing Educational				
Preparing Reports				

SECTION C 11:   TEACHER APPLICATION OF ICT LEARNING RESOURCES

16a. Do you have enough ICT books in your school?

Yes [   ]   No   [   ]

16 b.To what extent do you agree with the following statements regarding the influence of ICT learning resources on the integration of ICT into teaching and learning?

Use a scale of 1-5 where 5 = Very great extent and 1 = Not at all

17. Please indicate if the following resources are available in your school.

Exercise software   [   ]
Online tests   [   ]
Quizzes   [   ]
Data-logging tools   [   ]
Computer simulations [   ]

18. How many ICT books per pupil is available for reference?

……………………………………………………………………………………….

19. How many learners are you capable of handling during the lesson using the available resources?

20. In your opinion what is the manageable number of ICT lessons that a teacher should   have   per week?..

....

....

21. How would you rate the following concerning ICT in your institution?

1 = Really Emphasized 2 = Slightly Emphasized 3 = Not Emphasized	3	2	1
ICT skills and concepts			
Use of ICT in planning learning, teaching, assessment and evaluation.			
Collaboration and networking amongst teaching professionals			
Social, ethical, legal, and human issues in ICT use			

SECTION E: TEACHER ATTITUDE

22. Do you apply ICT in your teaching?

    Yes   ☐   No   ☐

23. How wouid you describe your attitude towards integration of ICT in teaching?

Positive ☐   Negative ☐   Not sure ☐

24. State your level of agreement to the following statements as regarding teacher attitudes towards ICT (Please use 1-Strongly disagree, 2- Disagree, 3- Neutral, 4- agree, 5- Strongly agree)

Statement	1	2	3	4	5
If teachers have negative attitudes toward technology, providing them with excellent ICT facilities may not influence them to use it in their teaching.					
Teachers need to be assured that technology can make their teaching interesting, easier, more fun for them and students, more motivating and more enjoyable					
ICTs is an important component in the process of teaching					
The school should always boost the attitude of teachers towards ICT by creating a conducive environment for ICT learning.					

25. How does policy and regulation in ICT application in teaching be enhanced?

27. How does teacher knowledge on the ICT influence their attitude towards ICT integrat?

……………………………………………………………………………………………
……………………………………………………………………………………………
………………

30. Indicate the extent to which you agree with the following on ICT integration in teaching . SA-Strongly agree, A- Agree, U- Uncertain, D- Disagree,

SD- strongly disagree

Impact	SA	A	U	D	SD
There is increased use of micro-soft office applications					
There is increased instructional materials in the internet					
ICT would improve the presentation of work in class					
Students use the multimedia technology					
Provision of professional support through the internet (online learning)					
Improve productivity					

SECTION E: Extent to which gender influences use of ICT in Teaching-learning

1E.Indicate by ticking your gender

Female ( )   Male ( ).

2E.How does gender affects the application of ICT into teaching?

Does gender influence teachers from using ICT in their lessons?

YES [ ] NO [ ] NOT SURE [ ]

If NO, explain:..

4E. Teachers with training Certificates in ICT are mostly:

Female [ ], Male [ ], All [ ], None [ ] Not Sure [ ]

5E. Computers are commonly used by: Female [ ], Male [ ], All [ ], None [ ]

6E. Teachers who own computers are mostly: Female [ ], Male [ ], All [ ], None [ ]

7E. Teachers who type their notes and exams using computers are:

Female [ ], Male [ ], All [ ], None [ ]

APPENDIX II: INTERVIEW GUIDE FOR THE HEAD TEACHERS

This interview is aimed at getting your opinion on the Evaluation on Integration of Information Technology in the teaching in public primary schools' in Nairobi county, Kenya. Your identity will remain confidential. Please be free to give your opinion.

SECTION A: BACKGROUND INFORMATION

1. How old are you? Under 30 years, under 40 ,Under50 ,Under 60

----

3. What is your Level of Education--.

SECTION B: COMPETENCE IN COMPUTER

5. Have you ever used a computer? --

6. Have you ever asked for any assistance when unable to search information?

 Yes [   ] No [   ]

7. i) What are the most common features you are able to search through internet (e.g.

sports, finance issues, educational etc.)? If more than one, kindly explain

…………………………………………………………………………………………
……

ii) Of what benefits are these features listed in 8(i) above to you?

....

....

12. i) Do you think your computer knowledge and ability to search information via the internet helps you in academic performance?

----

ii) Give reasons for your answer in 13(i) above

....

13. In what ways does your experience in computer applications on Integration of ICT in teaching be improved?...

14. How would you rate your level of expertise in computer use?

15 What is your view on ICT integration in teaching in your school?

----

15 Explain any support you provide to the teachers towards ICT inte Geoffrey, Grace Wgration

16 Describe any challenges experience in ICT integration in teaching?

17 In your opinion, how can we improve on the challenges----------------------------?

…………………………………………………………………………………………
…………………………………………………………………………………………

C] Does the school have enough rooms for storage?

…………………………………………………………………………………………
…………………………………………………………………………………………

D] To what extent does infrastructure affects integration of ICT in teaching ?

…...

16. (A) How does teachers' knowledge in ICT influence integration of Information

Communication Technology into school Curriculum?

(B) How many teachers in your staff are computer literate?

……………………………………………………………………………………

 (C) How many are teaching the computer lessons?

……………………………………………………………………………………

(D) What are the challenges faced by the ICT teachers in your school during the ICT

implementation in the teaching?..

17.) What are some of the policy interventions that can be used to increase the

integration of ICT use?..

SECTION E: Extent to which Gender influences use of ICT in Teaching-

learning

18. Does Gender influence teachers from using ICT in their lessons?

 10 b) If, explain:..

....

17) Which Gender of Teachers train mostly in ICT? --

----

18). Teachers who own computers are mostly: Female [ ], Male [ ], All [ ], None [ ]

19) How would you describe your attitude towards ICT integration in teaching?