

**ASSEESMENT OF TEACHER-BASED FACTORS INFLUENCING ICT INTEGRATION  
IN TEACHING AND LEARNING IN PUBLIC PRIMARY SCHOOLS IN KAJIADO  
NORTH SUB-COUNTY, KENYA.**

**BY**

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**A Research Project Report Submitted in Partial Fulfillment of the Requirement For The  
Award of Post-Graduate Diploma in Education of the University of Nairobi.**

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**DECLARATION**

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

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## **DEDICATION**

To God the almighty who imparted in me the strength to finish the work as required be glory. I honor my loving parents Mr. & Mrs. F. Mbugua with much appreciation for sacrificing their lives to support my academic pursuits. My sister Mercy and my son Jeremy for their love and support

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Glory and Honor be to God because of His doing.

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## **ABBREVIATIONS AND ACRONYMS**

<b>ICT</b>	Information and Communication Technology
<b>IT</b>	Information Technology
<b>UNESCO</b>	United Nation Education and Scientific Cultural Organization
<b>EFA</b>	Education For All
<b>KEMI</b>	Kenya Education Management Institute
<b>LDD</b>	Learning Digital Devices
<b>MTP</b>	Medium Term Plan
<b>USF</b>	Universal Service Fund

## **ABSTRACT**

The ultimate aim of this research was to investigate the teacher-based factors that influence the integration of ICT in public primary schools in Kajiado North sub-county. It also focuses on the strategies that could be adopted to improve the ICT application in teaching and learning processes in these schools. The research had five objectives, namely, to establish how teacher training influence ICT incorporation in learning processes in primary schools in the sub-

County , to examine how the age of teachers influence ICT integration in the public schools, to evaluate how teachers' attitude impact on the ICT incorporation in learning processes in public primary schools, to examine the teacher-gender influence ICT incorporation in learning processes in the public primary schools, and to make recommendations for policy development regarding ICT integration. In order to achieve the objectives of this research, samples were collected randomly from teachers and questionnaire filled to obtain data. An interview guide for the head teachers was also used. Data obtained was analyzed using SPSS using descriptive statistics, specifically the arithmetic means, percentages, and frequencies. These analyses were then represented in tables and graphs. From the study, it was established that the training of teachers on ICT was very important since it influenced their readiness to ICT incorporation in learning processes. The study also established that younger teachers of age bracket less than 30 years mostly had access and used computers than older teachers aged 41 years and above. Male teachers owned and used computers more than the female teachers and also the teachers had a positive attitude towards ICT incorporation in learning processes. Some of the recommendations given are: ICT workshops and training to be organized so as to reinforces the ICT skills of the teachers and head teachers, ICT to be a compulsory subject in teachers training colleges, the Ministry of Education, Science and Technology (MOEST) should equip all public primary schools with ICT infrastructure so as to encourage the female teachers to adopt the use of these technologies and finally teachers to be motivated with allowances and awarding of certificates to teachers who have undergone ICT training.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background to the study**

The acronym ICT is used in reference to technologies that allow access to information through communications. It basically anchors on communication technologies, especially the internet, computers, broadcasting technologies wireless network, mobile phones, and other communications medium. The integration of ICT in education implies the adoption of such technologies to enhance the quality of instructions-giving process and learning in institutions (UNESCO, 2005). With appropriate use, these technologies are expected to expand the access to education and to make strong the relevance of the systems, making them more of the digital workplaces. It is also expected to raise the quality of education by enhancing the learning and teaching process.

The computer is a significant and powerful ICT instrument which can be harnessed to improve education policies and practices. A computer is a tool that aids in decision-making and promotes lifelong learning. Basically, the computers emancipate both the teachers and learners by bringing change and stimulating the development of 21st century competencies (Trucano, 2005). It is believed that these technologies can foster the empowerment of teachers and learners leading to a significant transformation in the process of learning and teaching, changing it from being highly teacher-centered to learner-centered, a change expected to culminate in improved learning environments for students, problem-solving abilities, informational reasoning skills, establishing

and allowing for spaces for learners to cultivate their creativity, communication skills, and other critical thinking skills.

Kenya has taken an exceptional step in framing and implementing ICT policies and strategy. Encouragingly enough, these implementation strategies and policy frameworks are complete with significant outcomes and time frames (Farrell, 2007).

## **1.2 Problem Statement**

The ICT integration in learning processes strengthens the demand to provide the unique 21st Century skills to the learners. Kler (2014) recognized ICT as an efficient instrument that has the ability to enhance the communication among the teachers and the learners in the learning environment.

Under the 2006 National ICT Strategy for Education and Training, the government tried to incorporate technologies into the educational system, enhancing its accessibility, and sustaining it proficiency among the general population of youths.

It is because this that the government of Kenya substantially invested considerable resources in education reforms by supplying primary schools with ICT facilities and training of teachers on ICT integration in the curriculum.

In fiscal year 2014/2015, the government attained some of the initial and groundbreaking success in its effort to integrate ICT in education. One of the attained milestones was the training of 150 Master Trainers in ICT at the national level. The national trainers came from the ministry's semi-autonomous agencies given the mandate to train, namely; KEMI, CEMASTEPA, KISE, and KICD. Sooner after training the master trainers, 2550 teachers were given sets of training to qualify them as Trainer of Trainers (ToTs) coming from all the 47 Counties. The

training of this category of trainers was offered in the various counties by the Master Trainers. The ToTs then trained an average of 62,784 teachers from all the community primary schools at the sub-county levels. This training followed the developed standards 1 and 2 digital content that had been tested in more than 40 primary schools to ensure it measures to the curriculum objectives.

### **1.3 Purpose of the study**

The ultimate aim of the research was to assess teacher based factors influencing ICT integration in teaching and learning in said schools in Kajiado North sub-county.

### **1.4 Objectives of the study**

#### **1.4.1 General objectives**

To assess teacher-based factors influencing ICT incorporation in learning processes in community primary schools in Kajiado North sub-county.

#### **1.4.2 Specific objectives**

- i) To establish how teachers' training influence on ICT incorporation in learning in schools within the region.
- ii) To examine how the teachers' age impacts on integration of these technologies in teaching.
- iii) To explore the impact of gender facto on ICT incorporation
- iv) To establish how the attitude factor in ICT integration

## 1.5 Research Questions

The research was governed by the following questions:

- i) How does the age of teachers impact the incorporation of ICT in education in the community primary schools in Kajiado North sub-county?
- ii) How does the gender of teachers influence ICT incorporation in learning processes in community primary schools in Kajiado North sub-county?
- iii) How does the attitude of teachers impact on ICT incorporation in learning processes in community primary schools in Kajiado North sub-county?

## 1.6 Significance of the study

The main goal of the research was to investigate the teacher-based aspects that impact on the application of ICT in schooling. The insight into these factors would encourage the incorporation of ICT in both the learning and teaching process. The inquiry findings and recommendations could serve as a guide for an effective application of the technologies in schooling processes in community primary schools in Kajiado North sub-county.

*The information from this inquiry was useful to the collaborators who could look into the strengths and opportunities of integration of ICT program as well as its weaknesses and threats including challenges hindering ICT incorporation in learning processes. The findings of the inquiry would become a guiding instrument to improve future ICT-based content and syllabuses and ICT-based Teacher training programs in Kenya.*

Information generated from this inquiry would also be a guide to education stakeholders to make proper decisions regarding the ICT policies and investments in education at the primary level by



understanding teacher based factors influencing integration of ICT in teaching and learning in community primary schools.

Lastly, the research will also delve into providing information on ICT integration in primary school education that may guide the future researchers in the field.

### **1.7 Basic Assumptions of the Study**

This study will assume that:

1. All public primary schools under investigation had common characteristics and were adhering to uniform 8-4-4 curriculum.
2. All respondents were cooperative and provided reliable responses.

### **1.8 Limitations of the Study**

There were a number of challenges which were faced in this study. They included:

1. Financial and Time constraints

All these public schools would have been studied for a more conclusive result but this was not possible due to financial and time constraints. This inquiry was limited only to these public schools in Kajiado North sub-county, Kenya.

2. This study used teacher questionnaire and interview with the head teachers of the various schools to obtain data. The inquiry was only based on the teachers' responses and not on observation of the actual use of ICT in schooling but only depended on the response of the teachers.

## **1.9 Delimitation of the Study**

The delimitations of a given study can loosely refer to the various restrictions imposed by the researcher to demarcate the extent of the study. The study was delimited to teacher-based elements that impact ICT integration in schooling in community primary schools in Kajiado North sub-county, Kenya. Other factors may have been identified by other researchers however this research project only confined itself to the following factors: teacher training, teacher's age teacher's attitude and teachers' gender.

## **1.10 Definitions of Significant Terms Used in the Study**

**Attitude** is the individual teacher's thinking, behavior and feelings towards ICT incorporation in learning processes. Attitude comprises of emotions or actions of teachers toward technology in daily classroom practices.

**Age** is the number of years that a teacher has lived since he or she was born.

**Teaching** is the passing of knowledge or new concepts and skills.

**ICT Integration** refers to the use of ICT tools installed with instructional software in the classroom to teach and learn.

**Training of Teachers** this is the preparation of teachers in their profession which is usually through formal coursework and practice.

**ICT policies** refer to Plan of action on ICT integration agreed or chosen by the government.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

Computers started to be used in classrooms, both in high schools and universities of the bigger economies in the early 1980s. The broadband connections to these institutions became an ordinary thing in these big economies in the second half of the 1990s. In third world countries, this was more limited. The ICT investment in the United States of America's education is considered to be the largest in the world. The Department of Education in the US invests up to \$1 billion annually to enhance the use of technology in public education (Cairncross, n.d.).

To improve teaching and learning in schools global investments in ICT has been initiated by many governments. In the United Kingdom, for example, the government paid out £2.5billion in 2008-09 on educational ICT (Nut, 2010).

It is common knowledge that the use of computers in education has made major steps, from getting basic skills in computer, computer-facilitated teaching, research, and communications, to usage in every subject. This has been speeded up by coming together of the computer and communication technologies, especially, e-mail-based and Internet communications. This progression stems from a wide variety of efforts and the levels of integration of ICT in the education curriculum. This is often dictated by such factors as the social and economic status of individual regions and countries. Education occupies a central place in the social and economic development by positively contributing to human capacity-building.

However, in Kenya, the MOE identifies a number of problems in the delivery of education practices so as to achieve these aims. The challenges the country is still mulling regarding

incorporation of technology in its educational system include the lack of better access to education in general, quality issues, and inequity. These challenges better planning, management, and proper interventions which the country does not have in place at the moment. The projection by the Kenyan government, as stated in the Vision 2030 and Medium Term Plan (MTP), is to provide 20,000 computers to the schools in an attempt to revamp the education sector. The Ministry of Education is making tremendous efforts to provide more resources towards providing enough ICT infrastructures.

## **2.2 Teachers' Training and ICT Integration**

Teachers' skills in ICT and access to professional development are very important to ICT integration in school.

One of the challenges facing ICT incorporation in learning processes has been inadequate teachers trained in ICT integration in pedagogy. According to Demetriadis et al. (2003), the potential of ICT use in the classroom creates confidence in teachers and this empowers them to use ICT tools in schooling even more. As teachers develop ICT skills, their integration to teaching and learning becomes more effective. It, therefore, becomes important to equip teachers with the necessary professional knowledge and skills so that full potential of the use of ICT resources in the classroom is attained.

Shazia, (2000) found that despite some teachers having few certificates in computer packages, a small number of them were capable of using computers in their personal and professional activities.

A great challenge faced by teachers was acquirement of ICT facilities as posited by Semenow (2005). As a result, the Government of Kenya had visualized to setting up a Universal Service

Fund (USF) for the ICT sector to reduce the cost and to ease access to ICT infrastructure in underdeveloped regions.

### **2.3 Teacher's gender**

Gender is a significant aspect to consider when dealing with teacher policies, including ICT usage. It has been found from other studies on teachers' gender and ICT use that female teacher has a low levels use of a computer because of their limited access to technology, skill, and interest (Volman & van Eck, 2001).

In Senegal, being a developing African nation, the literacy level of women in technology remains significantly low (38.7%) whereas the literacy level of men in technology is around 61.8% in 2009. The female teachers fail to chase careers related to ICT due to a misconception that views technology as a career of men (Guoyan, 2010).

### **2.4 Teachers' Age**

Age affects teachers' effective embracement and use of new technology in tutoring (UNESCO, 2014). It was found that young teachers in the age bracket of 25-30 years had a higher interest in ICT (Chemwei & Koech, 2014). The young teachers show a great of enthusiasm in the adoption and use of computers in their private and in public life this was in comparison to the older generation who faced a challenge in the use of ICT.

### **2.5 Teachers' Attitude**

Teo (2008) found that teachers had a positive attitude towards computers and their application than their perceptions and usefulness. Teachers' attitudes towards integration of ICT in tutoring greatly impact their usefulness of technology and its integration in tutoring.

Buabeng-Andoh (2012) cited that the experiences teachers have in computers impacts their attitudes towards computers, especially in a positive manner. Omollo, Indoshi, and Ayere (2013) found that males had a slightly more positive attitude toward ICT use than females. Researchers such as Kurga (2014), Mwathi (2014), Mingaine (2013) cited that positive attitude towards new technology did not assure ICT incorporation in learning processes by the teachers. A study by Birgit (2011) cited that negative attitude of female teachers towards technology obstructs them from effective integration of ICT in teaching and learning processes.

## **2.6 Conceptual Framework**

A conceptual framework can be defined as a model grouping the variables of a study and their relationships Mugenda and Mugenda (2003). It is a diagrammatic presentation of the independent and dependent variables of the research.

**Figure 2.1 Conceptual Framework**

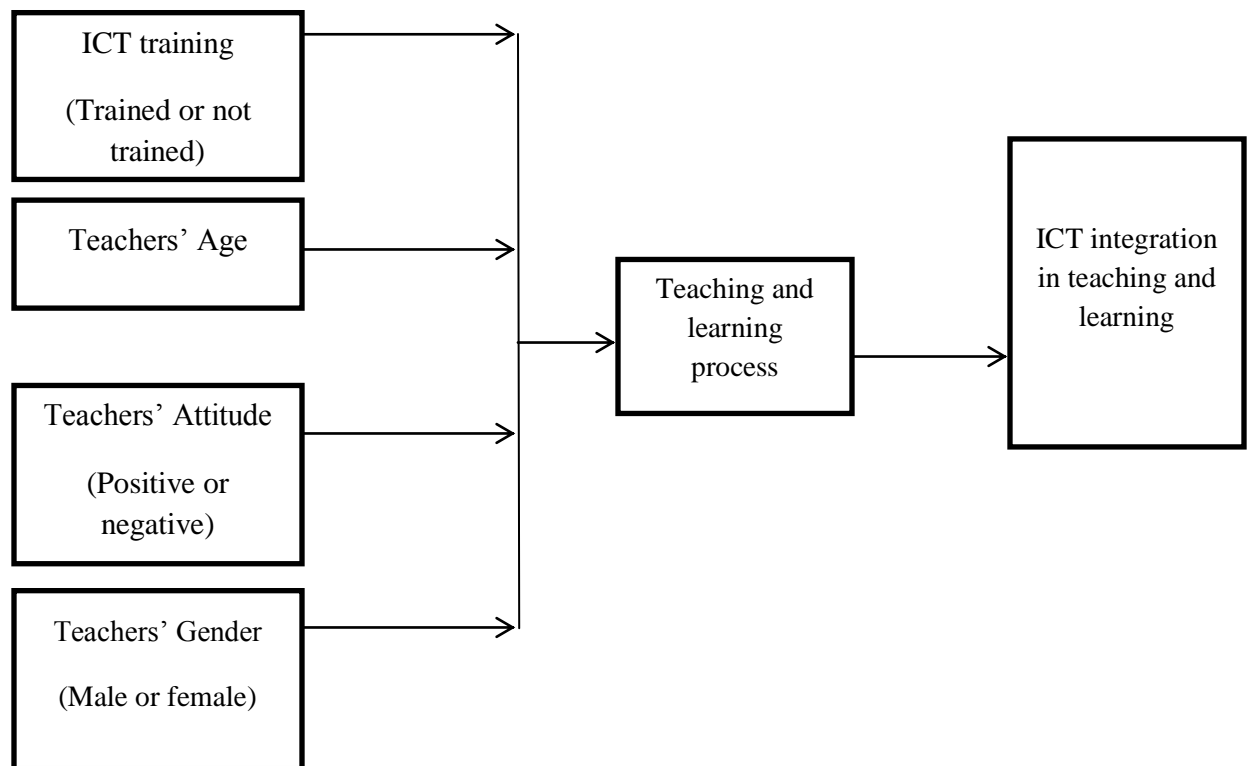


Figure 2.1 shows independent variables of the study which were ICT training of teachers, teachers' gender, teachers' age and teachers' attitude towards the integration of ICT in education. The dependent variable of the study is the result caused by the independent variables this was ICT incorporation in learning processes in community primary schools in Kajiado north sub-county.

## **2.7 Summary of literature review**

From the literature review, quite a number of teacher-based elements that influence the integration of ICT in education in community primary schools are seen. Some of these factors include training of teachers on ICT integration in teaching and learning, teacher's age, teachers' gender and teachers' attitude towards ICT incorporation in learning processes. The findings of this study showed that teachers with ICT skills in computer applications were able to develop lesson notes and present in the classroom with great technological competency. From the literature review, a positive attitude by the teachers towards ICT incorporation in learning processes was identified. Despite the positive attitude, some did not use it. Kurga (2014), Mwachira (2014), Mingaine (2013) cited that positive attitude towards new technology did not assure ICT integration in education by the teachers.



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Research Design**

This inquiry involved the use of descriptive survey design, which was useful in the collection of statistical data for the in-depth study of teacher-based factors influencing ICT incorporation in learning processes. The study employed a mixed method comprising quantitative and qualitative approaches suitable for questionnaires as research instruments to collect in-depth data on teachers based factors influencing ICT integration in education (Creswell, 2003; Kenya Institute of Management Training Series, 2011).

#### **3.3 Target population**

This refers to the group of individuals to which the researcher intends to apply the research findings (Fraenkel and Wallen, 2006). The target population of this study comprised of teachers of public primary schools in Kajiado North Sub-County in Kajiado County, Kenya. The sub-county has a total of 14 public primary schools and 390 teachers. Each of these schools has a computer education program run by I-Mlango.

#### **3.4 Sample Size and Sampling Procedures**

A sample is a representation of a target population. Gay (1998) argued that at least a sample of 10% to 20% of the population could be a sufficient representative. Thus out of the 14 this public schools five were selected to participate in the study. Also, seventy-eight (78) teachers were selected to participate in the survey. From each school at least one head teacher was picked to take part in the study giving a sum of five (5.)

The random sampling procedure was also used to arrive at the number of head teachers of the selected schools. Table 3.1 presents a summary of the respondents.

**Table 3.1 Sampling Grid**

<b>Sample type</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
Head teachers	4	1	<b>5</b>
Teachers	63	15	<b>78</b>
<b>Total</b>	<b>67</b>	<b>16</b>	<b>83</b>

### **3.5 Research instruments**

Questionnaires and interviews were used to collect data on teacher-based factors influencing ICT integration in teaching-learning processes in this public schools in Kajiado North Sub-County. The questionnaire was suitable for this study since it is cost-effective to gather data from many respondents simultaneously without engaging the researcher in too much movement from one respondent to the other (Borg, 1998).

#### **3.5.1 Instrument validity**

The research instrument validity is the extent to which a research instrument measures what it was designed to measure, whose validity was examined by experts in the area of study (Kothari, 2004; Mugenda and Mugenda, 2003; Orodho, 2009).

#### **3.5.2 Instrument reliability**

The reliability of an instrument refers to the extent to an experimental is consistent in its results after several repeated tests (Cohen, Manion, and Morrison, 2007). A pilot inquiry was conducted whereby the researcher tested both the questionnaires and interview guide prior to embarking on data collection.

### **3.6 Data collection procedure**

The researcher obtained permission to carry out the research from the National Commission of Science, Technology, and Innovation through an introduction letter from the University of Nairobi. Subsequent clearance to carry out the research was obtained from the County Commissioner Education's office in Kajiado County and from the District Education Office in Kajiado North sub-county. The researcher then sought permission from head teachers of the schools sampled to administer the instruments.

### **3.7 Data analysis technique**

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).

The data were analyzed using descriptive statistics. The data collected from closed-ended questionnaire items were scored and presented using descriptive statistics in tables (Creswell, 2003).

### **3.8 Ethical considerations**

The following ethical considerations were adhered to during the study.

- i) That the researcher did not plagiarized other people's works or give false research methodology and results.
- ii) The researcher was an integral person in the study and declares non-existence of any conflict of interests.
- iii) The collected data was in no way used as a tool to victimize and stigmatize any individual or society.

Permission was obtained in all the visited schools before engaging the teachers in the study. The researcher explained to the teachers that the participation was spontaneous. They were promised of confidentiality, privacy, and dignity as responders. The head-teachers were issued with an introduction letter as evidence to the authenticity of the study.

## CHAPTER FOUR

### DATA ANALYSIS, INTERPRETATION AND DISCUSSIONS

#### 4.1 Introduction

The current chapter dealt with analysis, presentation, and interpretation of data and discussions based on the objectives as arranged on the questionnaires and interview schedule.

#### 4.2 Questionnaires Return Rate

Seventy-eight (78) questionnaires were administered to 78 respondents. From the responses gotten in the field, 78 questionnaires were returned, fully filled meaning that they were suitable for the study. The questionnaire return rate was 100%. This was considered suitable as it surpassed 50%. As such, a study that gathers 50% data back from the respondents is a success as the data is perceived as accurate, informative and suitable for implementation.

**Table 4.1 Questionnaires Return Rate**

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<b>Items</b>	<b>Issued questionnaire</b>	<b>Returned questionnaires</b>	<b>Percentage response</b>
Public primary schools	78	78	100%
<b>Total</b>	<b>78</b>	<b>78</b>	<b>100%</b>

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#### 4.3 Demographic Information of the Respondents

The general demographic information of the respondent was collected, which included the respondents' age, gender, and academic qualifications.

#### 4.3.1 Gender Distribution of the Respondents

The inquiry focused on the gender representation of the respondents using the questionnaire. A vast majority (80.7%) of the responders were male while (19.3%) of the respondents were female. The findings are summarized in table 4.2.

**Table 4.2 Respondents' Gender**

<b>Gender</b>	<b>Frequency (f)</b>	<b>Percentage</b>
Male	63	80.8%
Female	15	19.2%
<b>Total</b>	<b>78</b>	<b>100%</b>

#### 4.3.2 Ages of Respondents

The researcher wanted to find out the respondents' ages and the figures are as below.

**Table 4.3 Age Distribution of the Respondents**

<b>Age brackets in years</b>	<b>Frequency</b>	<b>Percentage</b>
<30	10	12.82
31-40	36	46.15
41-50	24	30.77
>50	8	10.26
<b>Total</b>	<b>78</b>	<b>100</b>

When asked to show age bracket into which they fell, the majority (87.18) of the respondents were above 31 years of age. A small percentage of (12.87) were below 30 years of age. From the findings it was noted that the number of respondents trained in ICT was between 31 – 40 years of age, and then followed by between 41 – 50 years.

#### **4.3.3 Education Level**

The education levels of the respondents were sought so as to inform the training background and results were as summarized in table 4.4.

**Table 4.4 Distribution of Respondents by Education level**

<b>Education Level</b>	<b>Frequency (f)</b>	<b>Percentage</b>
M.ED	4	5.1%
BA/BSC with PGDE	0	0%
B.ED	14	18.0%
Diploma	40	51.3%



Certificate	20	25.6%
<b>Total</b>	<b>78</b>	<b>100%</b>

From the results, a majority (51.3%) of the respondents had achieved the diploma, (18.0%) of the respondents had achieved B.ED, (25.6%) of the respondents had attained Certificate and (5.1%) of the respondents had attained M.ED.

#### **4.4 Training and Integration of ICT in Education**

The investigation sought to establish the relationship between the training of teachers and the integration of ICT in education.

##### **4.4.1 Training and ICT Integration in Teaching and Learning**

The data were collected to establish whether training of teachers had any impact on their readiness to ICT incorporation in learning processes. The responses were summarized in Table4.5.

**Table 4.5 Training and ICT Integration in Education**

<b>Need for training</b>	<b>Frequency (f)</b>	<b>Percentage</b>
Yes	54	69.2%
No	19	24.4%
Not sure	5	6.4%
<b>Total</b>	<b>78</b>	<b>100%</b>

From these findings, a vast majority 69.2% of the respondents indicated that training of teachers had an influence on teachers' readiness to use ICT in teaching, 24.4% of the respondents did not agree that training of teachers had an impact on teachers' readiness to use ICT in teaching while 6.4% were not sure if training of teachers had an impact on teachers' readiness to use ICT in teaching.

#### 4.4.2 Teachers and ICT Integration Training

An important part of this investigation involved gathering information about the number of teachers with ICT training. 62.8% of the respondents were not trained in ICT integration while 37.2% were trained in ICT incorporation in learning processes. This shows that the high number of teachers were not skilled in instructional technological knowledge for ease of use in curriculum delivery. The findings were summarized in table 4.6.

**Table 4.6 Teachers and ICT Integration Training**

ICT skills/training	Frequency	Percentage
Yes	29	62.8%
No	49	37.2%
<b>Total</b>	<b>78</b>	<b>100%</b>

#### 4.4.3 Availability of ICT Workshops/Training

The study sought information on the availability of ICT training or workshops and whether teachers attended. From the findings of the study, majority of respondents 51.3% confirmed that in-service training or workshops of teachers in ICT incorporation in learning processes were not available, 23.1% of the respondents cited presence of in-service training or workshops of teachers in ICT incorporation in learning processes and 25.6% of the respondents

were not sure if in-service training or workshops of teachers in ICT integration in teaching and learning were available.38.9% of the respondents who said yes cited that teachers in their schools had not attended ICT workshops/training,50.0%reportedthat teachers in their schools had attended ICT workshops/training while 11.5% of the respondents were not sure if teachers in their schools had attended ICT workshops/training.

#### 4.4.4 Teacher and In-Service Training in ICT

The researcher sought information on whether all the teachers in various schools have attended ICT training. The findings of the study are summarized in table4.7.

**Table 4.7 Teachers and In-service Training in ICT**

<b>ICT training</b>	<b>Frequency(f)</b>	<b>Percentage</b>
Yes	25	32.1%
No	45	57.7%
Not sure	8	10.2%
<b>Total</b>	<b>78</b>	<b>100%</b>

The findings of the study established that 57.7% of the respondents indicated that ICT integration workshops were not attended by all teachers in their school, while 32.1% of the respondents agreed of all teachers’ participation in in-service training in their school, an additional 10.2% of the respondents were not sure if all the teachers in their schools had attended ICT training.

#### 4.5 Age and Integration of ICT in Teaching and Learning

The investigation sought to establish the age bracket of teachers who mostly had an access and use computers in their professional and private activities.

##### 4.5.1 The Age of Teachers Mostly Accessing and Using Computers

When asked of the age bracket of teachers mostly accessing and using computers, the results of the findings were as in Table 4.8.

**Table 4.8 Ages of Teachers Mostly Accessing and Using Computers.**

Age brackets	Frequency	Percentage
<30 years	45	57.7%
31– 40 years	21	26.9%
41 – 50 years	10	12.8%
>50 years	2	2.6%
<b>Total</b>	<b>78</b>	<b>100%</b>

The findings of the study found that a vast majority (57.7%) of the respondents aged below 30 years had access and use of computers in their private and professional activities. The teachers aged between 31-40 years (26.9%) slightly accessed and used computers while teachers aged 41-50 years (12.8%) also slightly access and use of computers, teachers aged 50 years and above (2.6%) indicated a negligible access and use of computers in education.

#### 4.5.2 Old Teachers and Attendance of In-Service Training on ICT integration

The study sought to establish whether old teachers do not attend in-service training on ICT incorporation in learning processes and the responses provided using the Likert-type scale as indicated in Table 4.9.

**Table 4.9 Old Teachers and Attendance of In-Service ICT integration Training**

	<b>Frequency</b>	<b>Percentage</b>
Strongly Agree	32	41.1%
Agree	20	25.6%
Not Sure	16	20.5%
Disagree	10	12.8%
Strongly Disagree	0	0%
<b>Total</b>	<b>78</b>	<b>100%</b>

From the findings of the study, the majority (41.1%) strongly agreed that old teachers do not attend in-service training on ICT integration, (25.6%) of the respondents agreed that old teachers do not attend ICT integration training,(12.8%)of the respondents disagreed with the statement that old teachers do not attend in-service training in ICT integration. On the other hand, (20.5%) of the respondents were not sure of the statement that old teachers do not attend in-service training in ICT integration. This showed that old teachers were not actively involved in ICT integration training, unlike the young teachers.

#### 4.5.3 Age of Teachers Mostly Attending in-service ICT Training

The investigation wanted to collect information on age bracket of primary school teachers who mostly attend in-service training on ICT integration in Kajiado North Sub-County. The responses are presented in Table 4.10.

**Table 4.10 Age Brackets of Teachers Attending ICT Training**

<b>Age of teachers</b>	<b>Frequency</b>	<b>Percentage</b>
<30 years	42	53.8%
31-40 years	29	37.2%
>41	0	0%
None of the above	7	9.0%
<b>Total</b>	<b>78</b>	<b>100%</b>

The findings of the study established that (53.8%) of the respondents aged below 30 years had attended ICT training, those aged between 31-40 years (37.2%) also had attended ICT training while(9.0%) of the respondents stated that none of the age brackets of teachers attended ICT training in Kajiado North Sub-County.

#### **4.5.4 The Age of Teachers with ICT Training during Pre-Service Training**

The investigation sought to examine the age of teachers that mostly received ICT training during pre-service training and the findings of the study are shown in Table 4.11.

**Table 4.11 Ages of Teachers and Pre-Service Training**

<b>Ages of teachers</b>	<b>Frequency</b>	<b>Percentage</b>
< 30 years	32	41.0%

31-40 years	24	30.8%
> 41	7	9.0%
None of the above	15	19.2%
<b>Total</b>	<b>78</b>	<b>100%</b>

These findings indicate that (41.0%) of the teachers in an age bracket below 30 years had ICT training during pre-service training, (30.8%) in the age bracket of 31-40 years and 7(9.0%) of teachers aged above 41 years attended ICT training during pre-service training. (19.2%) denied any available number of teachers trained in ICT during pre-service teacher training.

#### **4.6 Gender and Usage of ICT in Teaching and Learning**

The researcher sought to know on how gender influenced ICT integration in education processes.

##### **4.6.1 The gender that Commonly Owns and Use Computers**

The researcher sought to know whether each gender owns and use computers in teaching and learning processes. The responses are summarized in table 4.12.

**Table 4.12 Gender that Commonly Owns and uses Computers**

<b>The gender that owns and use a computer</b>	<b>Frequency</b>	<b>Percentage</b>
Female	13	16.7%

Male	15	19.2%
All	19	24.4%
None	27	34.6%
Not sure	4	5.1%
<b>Total</b>	<b>78</b>	<b>100%</b>

From the findings of the study, the majority (34.6%) of the respondents cited that none of the genders used and owned computers. On the other hand, 24.4% of the respondents cited that all genders, males, and females, owned and used computers; and 16.7% indicated that females owned and used computers; 19.2% indicated that males owned and used computers, while 5.1% of the respondents were not sure which gender commonly owned and used computers.

#### **4.7 Teachers' Attitude towards ICT Integration in Education**

The researcher sought to know teachers' attitude towards ICT integration in education. This is because good use of computers depends on the teachers' intentions, personal beliefs, and attitudes towards teaching with technology and the use of ICT.

##### **4.7.1 Teachers' Attitude towards ICT Integration in Education**

The study wanted to find out from the respondents, teachers' attitude toward the integration of ICT in education. The results are summarized in table 4.13.

**Table 4.13 Teachers' Attitude towards ICT Integration in Teaching and Learning**

	<b>SA</b>	<b>%</b>	<b>A</b>	<b>%</b>	<b>D</b>	<b>%</b>	<b>SD</b>	<b>%</b>
<b>STATEMENT</b>	<b>F</b>	<b>%</b>	<b>F</b>	<b>%</b>	<b>F</b>	<b>%</b>	<b>F</b>	<b>%</b>



I feel confident to use suitable software to present concepts in my subject area.	39	50	18	23.1	14	17.9	7	9.0
I often discuss with other teachers about ICT integration in a subject.	18	23.1	27	34.6	24	30.8	9	11.5
I am assured that the Internet gives suitable content with suitable learning experiences.	34	43.6	26	33.3	11	14.1	7	9.0
The used computer in designing and presenting content is not easy for me.	22	28.2	17	21.8	18	23.1	21	26.9
The computer is unreliable because of technical problems in a lesson.	23	29.5	11	14.1	24	30.8	20	25.6
I feel demoralized when I fail to fix small computer malfunction in lessons.	15	19.2	24	30.8	18	23.1	21	26.9

The results in Table 4.8 indicated that 50 % of the respondents strongly agreed that they felt confident to use suitable software to present concepts in their subject area. 34.6% agreed that they often discussed with other teachers about ICT integration in a subject.43.6% of the respondents strongly agreed that they were assured that the internet gave suitable content with suitable learning experiences.28.2% strongly agreed the use of computers in designing and presenting content was not easy for them. 30.8 % of the respondents strongly disagreed that the computer is unreliable because of technical problems in a lesson.30.8 % also agreed that they felt demoralized when they failed to fix a small computer malfunction in lessons.

#### 4.7.2 Causes of Teachers' Attitude towards ICT Integration

The researcher wanted to find out from the head teachers on possible causes of teachers' attitude towards integration of ICT in knowledge acquisition. The responses are summarized in table 4.14. 27.8% of the respondents cited lack of skills in ICT as the major cause of teachers' attitude towards ICT incorporation in learning processes. The findings further show that 22.2% of the respondents cited the use of ICT tools was time-consuming and cumbersome because of teachers' attitude towards ICT incorporation in learning processes. 11.1% of the respondents cited ICT facilities have been inadequate for all teachers; 22.2% cited lack of interest and negative attitude towards integration of ICT in knowledge acquisition prevented teachers from embracing ICT incorporation in learning processes, while 16.7% pointed out lack of experience in ICT hampered effective use of ICT in teaching.

**Table 4.14 Possible Causes of Teachers' Attitude towards ICT Integration in Teaching and Learning**

Possible Causes	Frequency (f)	Percentage
Lack of ICT facilities	2	11.1%
Lack of ICT skills	5	27.8%
Lack of ICT experience	3	16.7%
Lack of interest	4	22.2%
Time-consuming	4	22.2%
<b>Total</b>	<b>18</b>	<b>100%</b>

### 4.7.3 Improving and Changing Teachers' Attitude

The researcher sought to find out whether there could be ways to improve teachers' attitude towards ICT incorporation in learning processes and the responses are summarized in Table 4.15.

**Table 4.15 Suggestions to Improve and Change Teachers' Attitude**

<b>Statement</b>	<b>Frequency</b>	<b>Percentage</b>
Train teachers on ICT	2	40%
ICT to be a compulsory subject	1	20%
Motivate teachers with allowances and certificates	1	20%
Provide enough ICT resources in schools	1	20%
<b>Total</b>	<b>5</b>	<b>100%</b>

Majority (40%) of the respondents cited that training of teachers in ICT integration can improve their attitude towards ICT integration in teaching, (20%) of the respondents cited that ICT should be made a compulsory subject, (20%) of the respondents suggested that teachers should be motivated with allowances and certification and another (20%) of the respondents suggested that provision of adequate ICT resources in schools would improve teachers attitude towards ICT incorporation in learning processes.

## CHAPTER FIVE

### SUMMARY, CONCLUSION, AND RECOMMENDATION

#### 5.1 Introduction

This section is sub-divided into summary, conclusions, and recommendations for further study areas. These divisions were informed by the purpose of the investigation and the results.

#### 5.2 Summary

This study was conducted with the primary aim of assessing the teacher-based factors influencing the incorporation of ICT in education in Kajiado North sub-county. The objectives of the study were: to establish the impact of the teachers' training on ICT incorporation in learning processes in public primary schools in within the sub-county, to examine the impact of the teachers' age on ICT integration in knowledge acquisition in stated schools in Kajiado North Sub-County, to establish the impact of teachers' gender on ICT integration in teaching-learning processes in these public schools within the said region, and to establish how attitude of teachers impact on the integration of ICT in teaching and learning in this public schoolss in Kajiado North Sub-County.

The research employed a descriptive research design. Data collection was done through questionnaires sent to the teachers and through interviews conducted specifically for the head teachers. The data collected were then analyzed using descriptive statistics and represented on tables. The study sample size comprised of seventy-eight respondents working in various schools in Kajiado north sub-county. From the analysis, the following key findings were made:

### **5.2.1 Training of teachers and the integration of ICT in Teaching and Learning**

The findings of the research indicated that the training of teachers in ICT integration was very important since it influenced their readiness to accommodate the integration of ICT in knowledge acquisition process. The majority (69.2%) of the respondents confirmed that both the in-service and the pre-service training of teachers impacted significantly on their readiness to adopt ICT incorporation in learning processes. A significant percentage of the respondents (62.8%) lacked the necessary skills of integrating ICT in knowledge acquisition. 51.3% of the total respondents agreed that ICT workshops or training were not available for primary school teachers in Kajiado north sub-county. The investigation also found that (57.7%) of the teachers had not attended ICT training.

### **5.2.2 Age and ICT integration in Teaching and Learning**

The research also established that the teachers' age had a great influence on ICT integration in learning process. The teachers within the cohorts of below 30 years of age mostly had access and used computers, rated as(57.7%) of the total respondents. 41.1 %) of the total respondent strongly agreed with the statement that old teachers did not attend in-service training on ICT integration. (53.8%) of the total respondents cited that teachers in the age bracket of fewer than 30 years mostly attended in-service training in ICT. The study further found that teachers in the age bracket of fewer than 30 years(41.0%) had ICT training during pre-service training.

### **5.2.3 Gender and ICT Application in Teaching and Learning Process**

The research also aimed at establishing the extent to which gender influenced the integration of Information and Communication Technology in learning. From the findings, (24.4%) of all

the respondents indicated that both female and male teachers used and owned computers. (34.6%) of all the respondents cited that neither male nor female teachers used or owned computers. (16.7%) of the respondents indicated that females teachers owned and used computers while (19.2%) of the respondents indicated that male teachers owned and used computers.

#### **5.2.4 Teachers' Attitude towards ICT incorporation in learning processes**

The fourth objective of this study was to examine the impact of the teachers' attitude on the process of integrating ICT in learning in public primary schools sub-County. The research findings indicated that most of the teachers had a positive attitude towards the application and integration of ICT in learning. An approximation 50% of the teachers strongly agreed that they felt confident to use suitable software to present concepts in their various subjects also(43.6%) of the teachers were assured that Internet gives suitable content with suitable learning experiences. This revealed that teachers had a positive attitude towards ICT incorporation in learning processes. However, (28.2 %) of the teachers strongly agreed that the use of the computer in designing and presenting content was not easy for them.

The research also identified some of the causes of teachers' attitude towards ICT incorporation in learning processes. Some of the causes included: lack of interest, lack of experience, lack of ICT facilities in a school, lack of ICT skills and also use of ICT in learning as time-consuming.

Suggestions were also made on ways of improving teachers' attitude towards ICT integration in learning. The majority (40%) of the respondents suggested that the training of teachers in ICT would improve their attitude towards ICT integration in teaching and learning.

### **5.3 Conclusion**

This research work draws the following conclusions from the analysis herein: both the in-service and the pre-service training services offered to teachers on ICT integration in was very important since it influenced their readiness to adapt and adopt the use of ICT in learning processes and that most of the teachers did not have skills in ICT incorporation in learning processes.

The age of teachers has a significant influence on ICT integration in the teaching-learning process. The findings showed that younger teachers of age 30 years and below mostly had access and used computers in their day to day activities. This showed that the teachers in this age bracket readily embraced ICT in learning unlike the older teachers aged 41 years and above. Also, the younger teachers were skilled and competent in ICT incorporation in learning processes.

### **5.4 Recommendations**

The following recommendations were made based on the study findings:

- i) The education stakeholders should organize ICT training and workshops which reinforces the teachers' and head teachers' ICT skills. The schools' administration should also facilitate these teachers to attend the ICT workshops and training so as to equip them with adequate ICT integration skills in teaching and learning.
- ii) The Ministry of Education, Science, and Technology (MOEST) together with Kenya Institute of Curriculum Development (KICD) should make ICT to be a

compulsory subject in teachers training colleges so as to close the gap between older and younger teachers in the integration of ICT in teaching and learning.

- iii) On the teacher gender aspects, the Ministry of Education, Science, and Technology (MOEST) should provide all these public schools with ICT infrastructure so as to encourage the female teachers to use ICT in teaching and learning.
- iv) In order to better the attitude of teachers towards adoption and integration of ICT in teaching, the education stakeholders in different counties and sub-counties should intensify training of teachers on ICT integration competencies and also motivate teachers with allowances. The Ministry of Education, Science, and Technology (MOEST) should also award certificates to teachers who have undergone ICT training.

### **5.5 Suggestions for Further Research**

This study aimed at examining the teacher-based factors that impact ICT integration in teaching in public primary schools in Kajiado North sub-county. The researcher recommends that future research should focus student-based factors influencing ICT integration in teaching and learning in this public schoolss in Kajiado north sub-county. There is a need for a study on the influence of ICT integration on students' performance in primary schools.





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## **APPENDICES**

### **Appendix I: Introduction Letter to the Respondent**

The University of Nairobi,

Department of Educational Studies,

P.O Box 92,

Kikuyu.

The headteacher,

\_\_\_\_\_ Primary school

**REF: PERMISSION TO CONDUCT RESEARCH IN YOUR SCHOOL**

I am a postgraduate student at the University of Nairobi pursuing a postgraduate Diploma in Education. I hereby request you to allow me to collect data from your school by involving you and the teachers. The information collected will strictly be used for academic reasons and the information provided will be treated with utmost confidentiality.

Thank you in advance.

Yours faithfully,

Rahab Mbugua.

**Appendix II: Questionnaire for Teachers**

**SECTION A: Demographic Information**

Please answer the questions to the best of your knowledge. The information provided will be kept confidential.

1A. Indicate your Gender:                      Male [ ]                      Female [ ]

2A. What is your age bracket?

(a) Less than 30 years  (b) 31– 40 years

(c) 41–50 years  (d) Over 51 years

3A. What is your highest academic qualification? (a)Certificate  (b) Diploma  (b)

B.ED  (c) M.ED  (d) BA/BSC with PGDE

.....

**SECTION B: The Extent to which Training of Teachers Influence ICT Integration in Teaching and Learning**

1B. Is there in-service training on ICT integration available for teachers?

a) YES                       b) NO                       c) NOT SURE

2B. If YES, are there teachers in your school who attended ICT workshops/training?

a) YES                                       b) NO                                       c) NOT SURE

3B. If NO, why? .....

4B. Do you have skills/training in ICT Integration in teaching and learning?

- a) YES [ ]                      b) NO [ ]                      c) NOT SURE [ ]

5B. Do you believe that the computer training of teachers is important in imparting and improving teacher's ICT skills?

- a) YES [ ]                      b) NO [ ]                      c) NOT SURE [ ]

6B. If YES, how would training help improve teacher's readiness to use ICT?

.....

7B. If NO, why? .....

8B. Have all the teachers in your school attended ICT training?

- a) YES [ ]                      b) NO [ ]                      c) NOT SURE [ ]

9B. If NO, why haven't all teachers in your school attended ICT training?

.....

10B. In your opinion, does a teacher's computer training influence teachers readiness to integrate ICT in teaching and learning in primary schools?

- a) YES                       b) NO                       c) NOT SURE

Comment briefly:.....

**SECTION C: The Extent to which Age of Teachers Influence ICT integration in teaching and learning**

1C. Tick the age bracket of teachers mostly accessing and using computers. You can select multiple choices if appropriate.

- |                |                          |               |                          |
|----------------|--------------------------|---------------|--------------------------|
| Below 30 years | <input type="checkbox"/> | 31 – 40 years | <input type="checkbox"/> |
| 41 – 50 years  | <input type="checkbox"/> | Over 51 years | <input type="checkbox"/> |

2C. Old teachers do not attend in-service training on ICT integration.

- |                   |                          |          |                          |          |                          |
|-------------------|--------------------------|----------|--------------------------|----------|--------------------------|
| Strong Agree      | <input type="checkbox"/> | Agree    | <input type="checkbox"/> | Disagree | <input type="checkbox"/> |
| Strongly disagree | <input type="checkbox"/> | Not sure | <input type="checkbox"/> |          |                          |

3C. In-service training has been attended by teachers aged:

- |                   |                          |                   |                          |
|-------------------|--------------------------|-------------------|--------------------------|
| Below 30 years    | <input type="checkbox"/> | 31 – 40 years     | <input type="checkbox"/> |
| 41years and above | <input type="checkbox"/> | None of the above | <input type="checkbox"/> |



4C. Indicate the age of teachers with ICT training during pre-service training.

Below 30 years  31 – 40 years

41 years and above  None of the above

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

1D. Does gender impact teachers from using ICT in their lessons?

YES                       NO                       NOT SURE

If NO, explain:.....

2D. Do female teachers attend in-service training?

Yes                       b) No                       c) Not Sure

3D. If NO, explain: .....

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

Female ,      Male ,      All ,      None       Not Sure

5D. Computers are commonly used by:

Female ,      Male ,      All ,      None

6D. Teachers who own computers are mostly:

Female ,      Male ,      All ,      None

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

Female , Male , All , None

8D. In your opinion, how can gender disparity in ICT integration be addressed?

.....

**SECTION E: Influence of Teachers' Attitudes toward ICT Integration in Teaching and Learning**

Read carefully each of the statement and rate by ticking (√) where applicable in the table below, your level of agreement or disagreement with the statement. Use the provided keywords.

**Key: Strongly Agree (SA) Agree (A) Disagree (D) Strongly Disagree (SD)**

No.	Statement	SA	A	D	SD
1	I feel confident to use suitable software to present concepts in my subject area				
2	I often discuss with other teachers about ICT integration in our respective subjects				
3	I am assured that the Internet gives suitable content with suitable learning experiences				
4	Using computers in designing and presenting content is not easy for me				

5	The computer is unreliable for teaching because of technical problems in a lesson				
6	I feel demoralized when I fail to fix small computer malfunction during lessons				

**APPENDIX III: Interview Schedule for Headteachers.**

**SECTION F: Interview Schedule**

The researcher will administer the interview schedule to the school headteacher.

1F. Indicate your Gender:    Male                        Female           

2F. What is your age bracket?

(a) < 30 years                        (b) 31– 40 years           

(c) 41–50 years                        (d) > 51 years

3F. What is your highest academic qualification?

(a) Diploma             (b) B.ED             (c) M.ED   

(d) BA/BSC with PGDE     (e) OTHERS             (specify):

.....

4F. In your opinion do teachers like utilizing ICT in the teaching process?

.....

5F. In your opinion, what would make teachers not utilize ICT in teaching when computers are available? .....

6F. How can the teachers' attitude towards ICT be modified for the better so as to help them embrace the use of ICT in teaching? .....

7F. In one word, how would you summarize the attitude of teachers towards ICT use in your school.....

8F. How frequently do training of teachers take place or held?.....

9F. Comment of teachers' attendance to in-service pieces of training.....

10F. What is an estimated number of female teachers and male teachers attending the training?  
.....

12F. What are some motivating factors that influence teachers to attend training?  
.....