TEACHER RELATED FACTORS INFLUENCING INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY IN PUBLIC SECONDARY SCHOOLS IN NAROK NORTH SUB-COUNTY, KENYA

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A Research Project Submitted in Partial Fulfillment of the Requirement to the Department of Educational Foundations for the Degree of Masters of Education in Sociology of Education

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DECLARATION

This research project is my original work and has not been presented for a degree award in any other University.

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E56/85209/2016

This research project has been submitted for examination with our approval as the University Supervisors.

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DEDICATION

I dedicate this research to my wife Redempta Langat and to my children Genevieve Chemutai, Louise Chebwogen and Edel Quinn Chepngetich.

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ABBREVIATION AND ACRONYMS

BECTA	British Educational Commissions and Technology Agency.
CEMASTEA	Centre for Mathematics and Science Technology in Africa.
CESA	Continental Education Strategy for Africa.
ESP	Economic Stimulus Program.
ICDL	International Computer Driving License.
ICT	Information and Communication Technology.
KEMI	Kenya Education Management Institute.
MOEST	Ministry of Education, Science and Technology.
MOHRD	Ministry of Human Resource Development.
NACOSTI	National Commission for Science, Technology and Innovation.
OECD	Organization for Economic Co-operation and Development.
PC	Personal Computer.
SCQASO	Sub County Quality Assurance and Standards officer.
SDG	Sustainable Development Goal.
SPSS	Statistical Package for Social Sciences.
TPACK	Technological Pedagogical Content Knowledge.
TPD	Teacher Professional Development.
UNESCO	United Nations Educational, Scientific and Cultural Organization.

ABSTRACT

The purpose of this study was to examine the influence of teacher related factors on integration of Information and Communication Technology in public secondary schools in Narok North Sub-County. The objectives of the study sought to establish how teachers' training on ICT, teachers' age, and teachers' gender influence integration of ICT in public secondary schools. The study employed Everett Rogers' Diffusion of Innovation theory. A descriptive survey method was utilized in this research. Target population included the 20 public secondary schools in Narok North Sub County. The research targeted one Sub-County Quality Assurance Officer, 20 principals and 174 teachers. Stratified sampling technique was used for the study to sample the schools. Therefore out of 20 principals a sample equivalent to 30% or 6 principals were selected randomly. Out of a target population of 174 teachers, 52 teachers which forms 30% of the population was randomly selected. Questionnaires were administered to the teachers while interviews were conducted on the principals and the Sub County Quality Assurance and Standards officer (SCQASO). Descriptive statistics involved calculating frequencies, and percentages while the inferential statistics showed the relationship between the independent and dependent variables using Pearson correlation. There was a significant correlation between gender and technology literacy. The findings established that there was a significant correlation exists between training and technology literacy, knowledge deepening and knowledge creation. The level of training affects ICT integration in secondary schools. Based on the study findings it can be concluded that the gender of teachers influences technology literacy but it does not influence knowledge deepening and knowledge creation among teachers in public secondary schools. The age of teachers influences ICT use which relates to technology literacy and also influence knowledge deepening and knowledge creation among teachers

The level of ICT training influences positively technology literacy, training and knowledge deepening and training and knowledge creation in ICT integration for teaching and learning. The study recommends that the Ministry of Education need to support teachers training in integration of ICT for both male and female teachers to be encouraged to develop ICT literacy through training to enable them integrate ICT for teaching thus enhancing on students' achievement of set goals. Suggestions for further study recommends that a study on factors influencing the integration of ICT in education in the primary schools.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Modern cultures are progressively dependent on information and knowledge with digital information and communication technologies as main drivers (UNECO, 2017). This requires men and women who have Information and Communication Technology (ICT) abilities to deal with data and are imaginative and capable at critical thinking so as to enhance learning. Accordingly, one of the fundamental prerequisites for education in the twenty first century is ways of getting students ready for cooperation in an information based economy (UNESCO Report, 2017). Technologies can advance the teaching and learning procedure by upgrading the traditional ways of teaching delivery structures, continuing deep rooted learning and improving institutional administration.

Universally, the entrance of ICT to schools has prompted a noteworthy change of training scene (UNESCO, 2017). ICT is viewed as a vital piece of present day education training frameworks. Formulators of policies are in this way mindful to the need to guarantee arrangement between the advancement of ICT society, their coordination in schools and their utilization in instructional method (UNESCO, 2011). As from 2005, the interest for the integration of ICT in the educational programs has turned into a worldwide concern and of incredible significance towards accomplishment of the Education for All (EFA) and Sustainable Development Goals (SDG) objectives.

ICT incorporation in teaching in the Europe, is organized as a crucial method for instructive development and information change over the educational programs (UNESCO, 2011). ICT integration in instructional method in Germany was not completely embraced in schools in light of lacking prepared instructors on ICT integration in related subject innovation. The educators have positive self-adequacy to utilize innovation however have little learning on new academic methodologies that contrast from customary techniques for instructing (OECD, 2014; Sahlberg, 2010; UNESCO, 2005). In India, data and correspondence advancements have empowered the union of a wide exhibit of innovation based and innovation interceded assets for instructing and learning. It has along these lines turned out to be conceivable to utilize ICT as an omnibus supportive network for instruction (MOHRD, 2012). The significance of incorporating ICTs is highlighted in the global development agenda, all the more explicitly in the ninth SDG on advancement just as the fourth SDG, which submits the worldwide network to assure quality learning in schools (UNESCO, 2017).

At regional level, the Continental Education Strategy for Africa (CESA 16-25) emphasizes the need for ICT to develop access, quality and management. The overall strategy aspires to make another African residents that will identity a viable change agent for the continent's sustainable development as foreseen by the 2063 Agenda. The Sub-Sahara African countries are at the threshold of investing significant resources (material and human) in new digital technologies (Hennessy,

Harrison & Wamakote, 2010). According to the report of the Southern Africa Regional Meeting on ICT in education, infrastructure provision to schools and institutions and capacity building for ICT integration are areas that Governments are focusing on. In Namibia, the Ministry of Education has embarked on to verify the computer skills of students and teachers in schools in Namibia, over the next 5 years (2017-2021) on adoption of International Computer Driving License (ICDL) certification program. In South Africa, it is a policy requirement to provide every teacher, manager and administrator with the skills, knowledge, and backing they require to assimilate ICT in the teaching/learning of students, and a draft Development Framework for Digital learning has been developed (UNESCO, 2017).

In Kenya, the vision 2030 stipulates Kenya's goal to transform into a comprehensively aggressive and prosperous country with a high caliber of life (MOEST, 2013). To accomplish this objective, the training segment is required to convey this target in all the three aspects (social, financial and political) emerged in the vision secured on an overall appropriation of Science, Technology and Innovation (STI) as an execution apparatus. Integration of ICT is critical to the development of a skilled human resource. According to GOK (2012), the sessional paper Number 14 of the year 2012 notes that education shall be transformed to meet the 21st century needs for education and training through equipping the labour force with the necessary knowledge to partake and compete

in the knowledge economy and at the same time attain Kenya's educational goals. ICT is the gateway for learning of the 21st century skills and hence a rising urge for the education organizations to adopt ICT in teaching students and inculcating in them expertise and skills needed in the 21st century. ICT in curriculum delivery is central to learner-centred curriculum delivery in secondary school education. ICT enhances the teaching and learning quality by making sure there is a greater reach to education funding and by allowing participating technologies.

ICT training of teachers is essential as it helps them during the pedagogical process in using ICT equipment. Utilization of ICT in instructing learners is basic associated with digital world. ICT has been used to support instructing students in secondary schools in Kenya. It has been used to prepare printed materials for learners, project information for learners, to do research and to share ideas and information. This has been beneficial in enabling increased access to education, allow multisensory learning and learners are motivated to learn. It also promotes learner centred approach and contributes to active, integrative, creative and evaluative learning (KEMI, 2015).

According to Baskin and William (2006) absence of educator information about ICT, the absence of instructor proficient advancement in ICTs for instructing and learning and the absence of care staff to encourage reasonable expert improvement are a portion of the requirements and obstructions to ICT integrations. Further, Jacobsen and Lock (2004), note that instructors require to proceed with expert improvement as they think about what is intended to integrate

ICT in learning situations. The instructor has a basic task to carry out in the integration of teaching and learning (Harris & Hofer 2011); Instructors need to create information of instructional method of ICT use to capitalize on ICT to help teaching and learning (Ertmer & Ottenbreit-Leftwich, 2013).

The age of teachers determines the level of ICT integration in secondary schools because older teachers (above 40 years) are believed to have difficulty in embracing the adoption of ICT in instructing students process. They may have taught for long without the use of ICT. Ruthven et al., (2010) argues that the older lack experience or fear usage of ICTs. The older feel apprehensive by the new innovations than the young group. Chemwei and Koech (2014) reported that young teachers between 25-30 years of age appear to have greater interest in ICT. The young teachers show great enthusiasm in the adoption and usage of PCs in their daily life. Some researches however have conflicting information indicating that age has no influence on technology adoption.

Gender of teachers alludes to the socially acceptable jobs and socially learned practices and desires for ladies and men in a specific culture between male and female (World Bank (2009). Gender and technology utilization study express that in Africa, Women's investment in web use keeps on being low extending from 12 percent in Senegal to 38 percent in Zambia (Dholakia & Kshetri, 2004). Dorothy, Elishiba and Wangu, (2014); UNCTAD, (2014) further contend that in examination with the male educators, the female instructors find it hard to get to computers because of lack of time in utilization and specialized skills to operate

and fix a PC. What's more the female instructors scarcely get time to utilize PCs since they invest larger piece of their energy taking care of their families. There is little study on the aspects touching on the incorporation of Information and Communication Technology in the education sector in Narok North Sub County. Based on this background, this research endevoured to investigate teacher related aspects influencing the adoption of ICT in public secondary schools.

1.2 Statement of the problem

Regardless of the measures put in place by the Kenya government to develop the value of education in the secondary schools, the usage of ICT in instructing learners is quiet low (Mwunda, 2014). According to Ajzen (2005) lack of user acceptance and cynical attitudes towards incorporation of ICT in teaching/learning are the underlying barriers to successfully achieve a new information system in education. Meyer and Allen (1997) contended that the fundamental abilities of things to come are the utilization of ground-breaking innovations. The normal reading material can never again satisfy the need in the quick and the data enhanced world. What is more the customary instructor focused methodology makes study no longer successful framework to plan learners for the substances which they face sooner than later.

To address this, the Government of Kenya has devoted considerable funds to increase the incorporation of ICT in school particularly the secondary schools.

Through the Economic Stimulus Program (ESP), the government committed itself to set aside funds every financial year for the supply of ICT equipment and capacity building for teachers that will hasten the process of ICT incorporation in education (KEMI, 2015). There have been various workshops held by various parties in the Ministry of Education for in-servicing of teachers.

The government also initiated Computer For Schools Kenya (CFSK) project in 2002 with the aim of providing students and staff with modern ICT knowledge and skills required for contending in the new era (GoK,2008). The CFSK project encourages schools to incorporate ICT in instructing learners. The project initial target was 4000 secondary schools in Kenya. 93 schools have been supplied with 1860 computers out of the targeted 4000 public secondary schools (GOK, 2005). In order to integrate ICT successfully, the Ministry of Education targeted 300 Trainers of Trainers and 150 ICT champions for training on ICT.

The use of computers in the classroom level is limited due to issues affecting integration (Yusuf & Yusuf, 2009).However, despite these efforts by the government integration of ICT is still significantly very low. Therefore there is need for the research to examine the influence of teacher related factors in the adoption of ICT by secondary school teachers in instructing learners.

1.3 Purpose of the study

The purpose of this research was to examine the influence of teacher related factors on integration of Information and Communication Technology in public secondary schools in Narok North Sub-County.

1.4 Objectives of the study

The objectives of the study were:

(i) To establish the extent to which training of teachers on ICT influence the integration of ICT in public secondary schools in Narok North Sub-County.

(ii) To determine the influence of teachers' age on the integration of ICT in public secondary schools in Narok North Sub-County.

(iii) To establish the relationship between teachers' gender and the integration of ICT in public secondary schools in Narok North Sub-County.

1.5 Research questions

1. How does training of teachers on ICT influence the integration of ICT in public secondary schools in Narok North Sub-County?
2. To what extent does teachers' age influence the use of ICT in public secondary schools in Narok North Sub-County?
3. To what extent does teachers' gender influence the integration of ICT in public secondary schools in Narok North Sub-County?

1.6 Significance of the study

The study may assist government and curriculum developers with useful information for designing suitable programmes for training teachers in secondary schools properly for integrating ICT to teach and learn. The research findings of this study may provide guidance for effective adoption and use of ICT as a 21st century pedagogical skills in the instructing learners process which may be useful for school managers and teachers in coming up with policy for effective implementation of ICT integration and may also help school managers in inspiring the teachers and establishing in service training that may develop their expertise as well as build their assurance and capability in the incorporation of ICT when they teach. The research findings may also be useful to provide useful information to education planners, curriculum developers and policy makers on the factors influencing the incorporation of ICT in schools that are of secondary type and hence come up with ways of addressing them which will increase the education quality. In addition the study may contribute to research literature. It may also act as a model to scholars that want to research further research on the subject of ICT integration.

1.7 Limitations of the study

The investigator was unable to control participant's unwillingness to respond to research questions, perhaps due to their negative attitude towards integration of ICT. In order to address this challenge, the investigator guaranteed contributors that the study was only meant for academic purposes and the information provided will be confidential. It had been the researchers wish to do the study in

all the schools in the whole Sub County but this was not possible because of some hindrances which included inadequate funds, geographical terrain, limited time and poor infrastructure.

1.8 Delimitations of the study

The study was confined to teacher aspects affecting ICT adopted by the teachers. The study sampled principals and teachers as respondents because they are important in the execution of the National policy on ICT.

1.9 Assumptions of the study

(i) The participants were willing to give honest and reliable responses without fear, bias or suspicion.

(ii) Respondents were competent and willing to adopt ICT in instructing students.

(iii) ICT is present in the targeted schools.

(iv) The sampled teachers are trained in integrating ICT in instructing learners.

1.10 Definitions of operational terms

Age Refers to the length of time a teacher has lived since he or she was born.

Gender Refers to socially defined and not biologically constructed, sex attitudes and roles of females and males.

ICT Integration Refers to the adoption of technology in unified way to back and spread curriculum goals and to involve students in purposeful learning.

Knowledge creation Refers to the training programs prepare and provide support for secondary school teachers' pedagogical approaches regarding the way they teach and use ICT to enhance teaching

Knowledge deepening Refers to measures put in place to increase or develop secondary school teachers understanding computer literacy for effective integration of ICT in public schools.

Public secondary school Refers to post primary schools that are government sponsored for students education prior to tertiary education level.

Teacher Training Refers to training of teachers that enable them to have skills to teach a given subject.

Technology literacy Refers to secondary school teachers' mastery on computer usage through acquiring the appropriate training to integrate ICT concept in pedagogical process.

1.11 Organization of the study

The project work is presented in five chapters. Chapter one is the introduction which comprises of the background to the study, statement of the problem, purpose, objectives, research questions, significance of the

research, limitations, delimitations, assumptions of the study, definition of terms and the research organization. Chapter two is the literature review and focuses on the ICT concept, ICT adoption in instructing students, teachers training and ICT integration, age of teachers and ICT adoption, gender and ICT adoption, theoretical framework as well as conceptual framework. Chapter three covers methodology of the research. It presents the design, population targeted, techniques in sampling, tools to be used, reliability and validity of tools, data collection methods, methods of analyzing data and ethics. Chapter four covers data analysis, presentation and discussion. Chapter five presents a summary the major findings, conclusions and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter shows research on teacher related factors affecting the adoption of ICT in instructing students. Specifically the areas to be covered include; the concept of ICT, ICT adoption in Education, teachers training and ICT integration, age and gender in ICT integration as well as theoretical and conceptual framework.

2.2 The concept of ICT integration

The needs of the 21st century require that students must be solid and steady enough to fulfill the needs of the new information age. The 21st century abilities set for work are best created utilizing the monstrous learning openings displayed by ICT (MOE, 2013). As indicated by Tinio (2002), ICT greatly influence training in obtaining and ingestion of information to the educators and leaners through the progression of dynamic learning, communitarian and helpful learning, imaginative learning, integrative learning and evaluative learning.

Information and Communication Technology as per UNESCO alludes to any differing set of technology instruments and assets used to transmit, store, make, offer or transfer data. These innovative apparatuses incorporate PCs, the web (sites, online journals and e-mail messages), live communicating advances (radio, TV and webcasting), recorded telecom advances (podcasting, sound and video

players and capacity gadgets) and communication; fixed or portable, satellite, visio/video conferencing, and so on (Pierson, 2001).

As indicated by Miles and Singal (2010), ICT represents a wide range of kinds of electronic frameworks which incorporate LCD projectors, iPods, digital schools, Smart-sheets, fax machines, scanners, printers, advanced/camcorders, TV, radio, PDAs, DVDS, landlines, number crunchers and arrange and different PC programming, video conferencing, texting, web journals and email. ICT (Information and interchanges innovation) is a big term that integrates any specified device or application, comprising: satellite frameworks, TV, phones, radio, PC and system equipment and programming, just as the dissimilar managements and applications related with them, for instance, video conferencing and learning separation (Rouse, 2005).

2.3 ICT integration in Education

The utilization of ICT in instructing learners is basic in this digitally associated world. It is gainful to both the instructors and the students. The British Educational commissions and Technology Agency (BECTA, 2003) in an exploration about ICT, announced that ordinary utilization of ICT crosswise over different educational modules subjects, may have a valuable persuasive effect on students learning.

As indicated by Grabe, and Grabe, (2007) powerful utilization of ICT as a training learning resources has been related with critical increase in students' accomplishment. Learners gain certainty as they get connected by their instructors as collaborators trying to take care of innovative issues.

Pierson (2001) contend that because of the impacts of ICT at the working environment and regular day to day existence, the present instructive establishments endeavor to rebuild their instructive curricular. The procedure of coordination of ICT in instructing and learning procedure connects with students since it underpins different kinds of associations in the learning condition. Integrating innovation devices into the educational modules is turning into an indivisible piece of good instructing .Successful utilization of ICT as per Laaria (2013) will enable educators to embrace students focused instructing systems upgrade their proficiency and excitement, energize their arranging and collaboration, lessen their outstanding burden and improve the connection among instructors and learners. As indicated ICT in teaching can spur learners, improve their basic reasoning, animate their advantage, increase their imagination, permit more noteworthy intelligence, increase their fearlessness and confidence and increase their accomplishments.

Utilization of ICT as per Kim (2009) additionally advances learners basic reasoning and critical thinking aptitudes required throughout everyday life. Learners today live in an inexorably information based and comprehensively

interconnected society, affected by advancing financial, ecological and social conditions. To make progress and satisfaction as residents, learners should act naturally coordinated students, basic scholars and issue solvers (Alberta Education, 2010). Innovation is a useful asset for basic reasoning, applied improvement and critical thinking. Learners can hence utilize it for critical thinking and build up a profound comprehension of the topic.

The Ministry of Education, Science and Technology adopted the TPACK model by Koehler and Mishra for successful incorporation of ICT into education. The model consists of the content, pedagogy and technology. The three elements have to interact at all times so that the full advantages of ICT adoption are achieved. Research has shown that, when carefully used, ICT tools have the capacity to transform teaching and learning, extend learning as well as support teaching, learning and classroom management (MOEST, 2013).

ICT has been used to support instructing students in secondary schools in Kenya. It has been used to prepare printed materials for learners, project information for learners, to do research and to share ideas and information. This has been beneficial in enabling increased access to education, allow multisensory learning and learners are motivated to learn. It also promotes learner centred approach and contributes to active, integrative, creative and evaluative learning (KEMI, 2015).

2.4 Teacher training and ICT integration

The Ministry of Education in an effort to entrench the aspect of quality of education and preparation as envisaged in the vision 2030, will ensure the use of ICT for instructing learners in Kenya's primary and secondary schools. Kenya still grapples with test extending from lack of connectivity, infrastructure, electricity, and finances as well as building capacity of all participants (Hennessy et al., 2010).

Ogembo et al, (2012) contended that the real utilization of innovation stays limited in spite of impressive development in the quantity of PCs obtained by the schools found in Kenya. A straightforward position of equipment as well as programming won't ensure a reasonable change process with regards to ICT use inside instructive settings (Tondeur, Cooper & Newhouse, 2010). This in this way implies putting innovative gadgets puts a substantial interest on the expert advancement (Hawkridge & McMahon, 1992).

Teachers are keys in the educational innovation. ICT skills is an invaluable prerequisite that will help. According to Hartnell Young (2009), instructors with curriculum understanding are more probable to innovate within their practice. Wangari (2008) notes that ICT integration suffers from lack or limited technical support in management and preventive maintenance. This suggests that schools do not have the required personnel or Technicians and this makes ICT integration

a difficult undertaking. Innovation is coordinated when it is utilized in a smooth way to help and stretch out educational programs, goals and to draw in students in significant learning.

Mandell, Sorge, and Russell (2002) asserts that factors that impact the adequacy of learning isn't the accessibility of innovation, however the instructive routine with regards to utilizing technology in schools. This accordingly calls for instructors to be proficient about procurement of ICT knowledge, however more critically, about comprehension of teaching to upgrade students' learning (Krug &Artnzen, 2010). Baskin and William (2006) declares that absence of educator information about ICT, the absence of instructor proficient advancement in ICTs for instructing and learning and the absence of care staff to encourage reasonable expert improvement are a portion of the requirements and obstructions to ICT integrations.

Mishra and Kohler (2006) recommend that for ICT to help in instructing learners, instructional method and that which educators need to understand to effectively consolidate innovation must be considered. Jacobsen and Lock (2004), note that instructors requires to proceed with expert improvement as they think about what is intended to integrate ICT in learning situations. The instructor has a basic task to carry out in the integration of teaching and learning. Instructors need to create information of instructional method of ICT use to capitalize on ICT to help in

teaching and learning (Harris & Hofer 2011; Ertmer & Ottenbreit-Leftwich, 2013).

Education ministries are required to implement a new outline for TPD that mirrors a move from preparation to enduring proficient readiness and growth of teacher which according to Haddad and Draxler (2002) and Carlson and Gadio (2002), this framework specifies a number of components of TPD which include; initial preparation/training, structured opportunities for retraining and endless backing for teachers as they undertake their daily work. Motivation, access to ICTs, teachers' subject knowledge, teacher self-learning and on-going in-service training are issues critical to Teacher Professional Development (KEMI 2015).

This makes continuous Teacher professional development efficient in assisting teachers be comfortable in the use of ICT and adopt successfully into their teaching. In Garet, Porter, Desimone, Birman, and Yoon (2001) discoveries, the main highlights of value proficient advancement that affect instructors' increase in information and aptitudes and changes in classroom practice contained an emphasis on substance learning, open doors for dynamic learning, and lucidness with other learning exercises. This study investigated how ICT training of teachers influence the incorporation of ICT in instructing learners.

2.5 Age and ICT integration

According to Peeraer and Petegem (2011), teachers' age can impact usage of ICT in teaching among educators especially the individuals who were conceived in the realm of advances or late adopters who got to innovations all the more as of late. In Cyprus, instructors who start utilizing PCs at the time of 40s or 50s face incredible trouble to comprehend programming language or figuring directions. Most research results have demonstrated that there is more utilization of ICT by Young individuals contrasted with the older persons.

Older (above 40 years) may have difficulty in embracing the adoption of ICT in instructing Students process because of the fact that they may have taught for long without the use of ICT. Ruthven et al., (2010) argues that the older lack experience or fear usage of ICTs. The older feel apprehensive by the new innovations than the young group. Chemwei and Koech (2014) reported that young teachers between 25-30 years of age appear to have greater interest in ICT. The young teachers show great enthusiasm in the adoption and usage of PCs in their daily life. Some researches however have conflicting information indicating that age has no influence on technology adoption.

2.6 Gender and ICT integration

Access to and the adoption of ICT is crucial for women and girls to be able to contribute in society on equal terms with men and boys. Gender alludes to the socially defined jobs and socially learned practices and desires for ladies and men

in a specific culture between male and female (World Bank (2009). Gender and technology utilization study express that in Africa, Women's investment in web use keeps on being low extending from 12 percent in Senegal to 38 percent in Zambia (Dholakia & Kshetri, 2004).

There has been a moderate yet unfaltering take-up of the innovations by females, for example, phone, mobile or PC (Gupta, 2008). Dorothea, Hollow and Pervuda (2014) contend that gender disparity starts from early tutoring when guardian's support and offer young men better chances over girls. Omollo, Indoshi and Ayera (2013) contend that instructors' preparation to receive and utilize technologies in teaching, change starting with one gender then onto the next; among females and male educators. The moderate rate of ICT incorporation in the educational programs is because of instructors' variables, especially the gender perspective as far as male and female (Rather & Kuraishy, 2004).

They further contend that in examination with the male educators, the female instructors find it hard to get to computers because of lack of time in utilization and specialized skills to operate and fix a PC. What's more the female instructors scarcely get time to utilize PCs since they invest larger piece of their energy taking care of their families (Dorothy, Elishiba &Wangu, 2014; UNCTAD, 2014). This is additionally upheld by Volman and Van Eck, (2001) who contended that

female instructors have low knowledge of PC use because of their constrained innovation, access, expertise and interest.

The male educators then again adopted ICT more in instructing and learning process than the female partners (Kay, 2006; Wozney et al., 2006). Some examination studies with respect to sex and innovation usage, anyway have discovered no noteworthy contrast among males and females in connection to technology implementation. Al-Gahtani, and Hubona (2007) found that gender orientation was not a huge variance on new technology usage in an investigation of the impacts of sex on new innovation execution in a developing nation. The investigation along these lines tries to set up the connection amongst teacher gender and the adoption of Information Communication Technology in instructing learners.

2.7 Theoretical framework

The study employed Everett Rogers' Diffusion of Innovation theory (Rodgers, 2003). As asserted by Rogers, diffusion is a procedure that a technology communication is done using given networks over a period amongst the members in a social system. The theory strive to explain why, how, and the rate at which new technology and ideas extent through cultures (Jordana, 2011). The diffusion of innovation theory has four components which include: time, innovation, social system and communication.

The strength of the Rogers' Diffusion of Innovation theory is that it follows a systematic process in the adoption of technology (Wejnert, 2002). These steps are: persuasion, knowledge, decision implementation stage, making stage, and confirmation stage. The theory also sees integration as primarily being about reinvention of merchandises and manners so as to fit the individual or a group. The weakness of the theory is that it does not focus on persuading individuals to change advocated by other theories of integration (Rodgers, 2003).

Despite its weakness, this theory is applicable to the research since the diffusion being described by the theory as a procedure technology and is communicated through a given networks over a period amongst the participants in a social system can be related to the influence of teacher related factors. The theory is applicable in the study as the theoretical processes have a bearing on the integration in education.

2.8 Conceptual framework

Figure 2.1 presents the conceptual framework of the research.

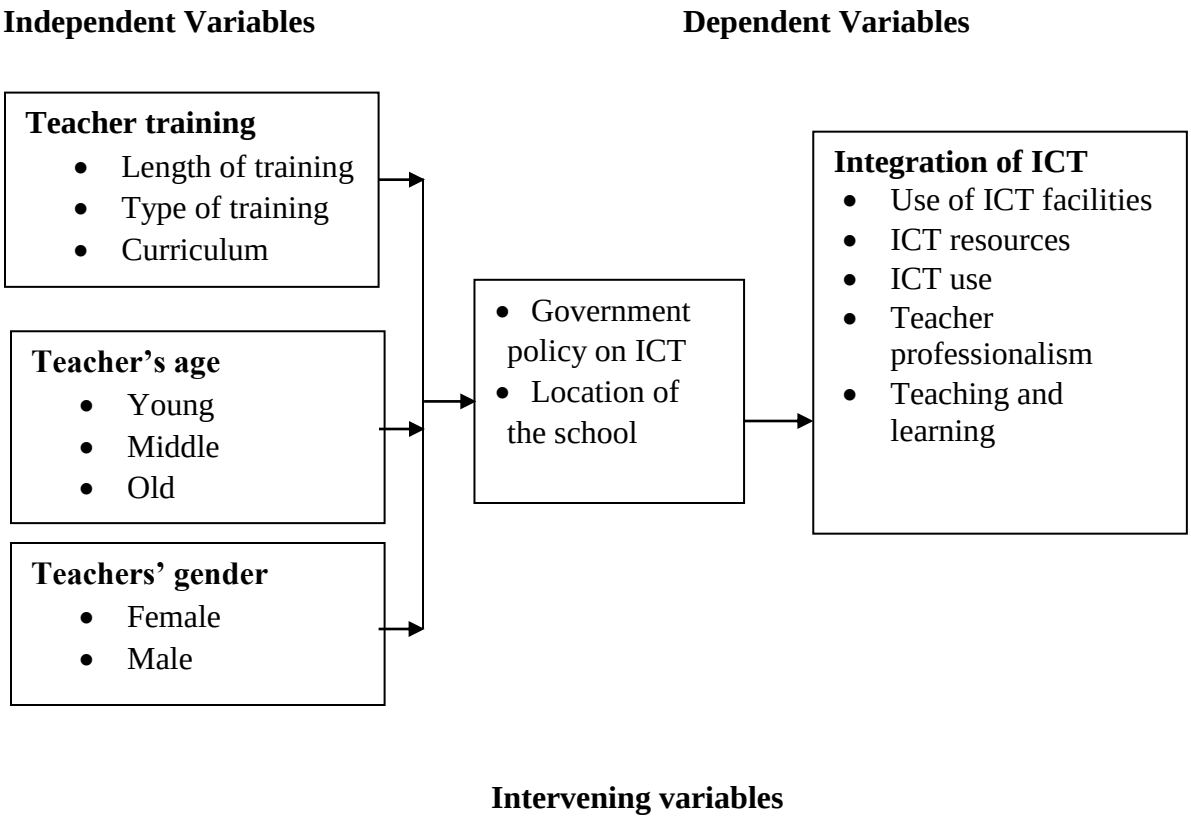

Figure 2.1: Conceptual framework showing the relationship between teacher related factors and integration of ICT

The conceptual framework shows that teacher training, age and gender have a direct influence on ICT adoption in schools. However the success of the process depends on government policy which influences its implementation at secondary school level of schooling.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on research design, target population, sample and sampling procedures, research instruments, piloting, validity of the instruments, reliability, data collection procedure, data analysis techniques and ethical considerations.

3.2 Research design

Research design alludes to a given arrangement done for gathering and examination of information in a given research (Kombo & Tromp, 2006). A descriptive survey method was utilized in this research. It is a technique for gathering data by interviewing or issuing questionnaires to participants (Orodho, 2003). This technique is a compelling method for gathering data from large sources moderately efficiently and takes a short time. Descriptive survey design was appropriate for this study because it helped the researcher to obtain data on the existing phenomena on the perceptions, attitudes and opinions held by respondents through asking questions using questionnaires and interview schedule for enmity. The design was also deemed appropriate for the study because it enabled the researcher to collect data from a large population within a short time to get the reality of the situation of the ground.

3.3 Target population

Target population included the 20 public secondary schools in Narok North Sub County. The research also targeted one Sub-County Quality Assurance Officer, 20 principals and 174 teachers. The teachers' population in the 20secondary schools

consists of 123 males and 51 females (Narok North Sub-County Education office, 2019).

3.4 Sample size and sampling procedure

Mugenda and Mugenda (2003) described sampling as a process of selecting a manageable number of individuals with potential to denote the large group of individuals where they were picked. Stratified sampling technique was used for the study to sample the schools. It is asserted by Oso and Onen (2005) that this approach ascertains sub groups in a population and hand-picked from each sub-group to come up with a sample. The schools were sampled in the six zones where one secondary school was randomly picked to participate in the study.

Mugenda and Mugenda (2003) proposes 30% as recommended for determining desired samples of a size in descriptive studies. Therefore out of 20 principals a sample equivalent to 30% or 6 principals were selected randomly. Out of a target population of 174 teachers, 52 teachers which forms 30% of the population was randomly selected. The sample size was as presented in Table 3.1.

Table 3.1: Summary of sample size

Respondents	Number	Sample 10%
Teachers	174	52
Principals	20	6
Sub County QASO	1	1
Total	**195**	**59**

3.5 Research instruments

Questionnaires were administered to the teachers while interviews were conducted on the principals and the Sub County Quality Assurance and Standards officer (SCQASO). Questionnaires contained a set of written questions which respondents filled in without guidance or scrutiny of the researcher. The questionnaires consisted of two sections; section A and B. Section A aimed at eliciting general information about background characteristics of the respondents. Section B consisted of questions about teacher related factors and how it impacted the embracing of ICT in instructing the learners. The questionnaires were designed with research objectives in mind in order to elicit responses on each objective. Questionnaires contained both open and closed ended questions to allow for collection of qualitative and quantitative data. Interviews were done on the principals and Sub County QASO since interview is an essential tool in following up for more information in an area of curiosity (Kothari, 2004). The interview guide contained open ended questions on items answering the study objectives. The information gleaned from interviews were manually recorded for further content analysis.

3.6 Validity of the instrument

Validity is the suitability, significance, correctness, and usefulness of a given inferences investigators make on the data they collect. It is concerned with the question of whether what the researcher is measuring is what is envisioned to be measured (Kothari, 2004). To enhance validity, a pilot study was performed in 1% of the target population as stipulated by Mugenda and Mugenda (2003). In the actual research, the Sub County QASO, Principal and teachers in the selected schools were involved.

3.7 Reliability of the instrument

Reliability denotes the indentation that a tool results to dependable findings after a number of trials. This study used test-retest where degree of consistency between the test scores, responses and observations were called reliability. The test-retest involved issuing the same tool twice to similar respondents. The two sets of scores were then correlated using Pierson's product correlation co-efficient to test the instruments reliability (Best & Kahn, 2006). A correlation co-efficient of 0.7 or above was taken as being appropriate. For this study, the research tools scores of 0.81 for the teachers' questionnaire, 0.79 for the principals and SCQASO interview guides were deemed appropriate.

3.8 Data collection procedure

A letter of introduction from the University of Nairobi, School of Education; was sought, then a permit was sought from National Commission of Science, Technology and Innovation (NACOSTI) for data collection and thereafter the

Director in the Sub County was contacted to give introductory letter to the school principals and teachers involved. The principals were contacted to inform them of the study and for the purpose of making prior arrangements to administer questionnaires to the teachers in their schools.

3.9 Data analysis techniques

All the information from the quantitative tools were coded. Computer software, Statistical Package for Social Sciences (SPSS) software programme was used in entering and managing the data. Collected data was analyzed using both descriptive and inferential statistics and presented in tables, frequencies and percentages. Descriptive statistics involved calculating frequencies, and percentages while the inferential statistics showed the relationship between the independent and dependent variables using Pearson correlation. Qualitative data was analyzed by means of thematic method and founded on the objectives of the study.

3.10 Ethical issues

The analyst guaranteed the participants of the privacy of the data collected. All work from different sources were completely recognized and displayed in the references to evade copyright infringement. The researcher complied with the guideline of intentional assent where the respondents were required to partake in the study willingly. The researcher utilized the information as per the expected reason for the research. The principals of the schools gave the researcher authorization so as to permit the teachers partake in the investigation.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of data analysis. The chapter is divided into five sections with section one covering the response rate while the other section covers the demographic description of the respondents involved in the study while section three to five covers the three objectives of the study. Analysis was done using descriptive and inferential statistics. The analyzed data was presented using tables and figures and interpreted to answer the objectives of the study.

4.2 Instrument return rate

After data collection, out of the 52 questionnaires, 46 questionnaires were duly filled and returned representing 88.5 percent return rate. All the six principals sampled and the Sub-County Quality Assurance and Standards Officer availed themselves for an interview with the researcher. The total return rate for research instruments used for data analysis was 89.8 percent which was considered adequate to provide sufficient information. The return rate was perhaps influenced by the mood of the respondents, length of the questionnaire and the subject area.

4.3 Demographic information of respondents

The demographic information sought from participants was gender, age, teaching experience and level of education of the respondents. The respondents were asked to indicate their gender in the questionnaire. The results are presented in Table 4.1.

Table 4.1: Gender of the respondents

Gender	Frequency	Percent
Male	31	67.4
Female	15	32.6
Total	**46**	**100.0**

Table 4.1 shows that 67.4 percent of the teachers were maleswhile32.6 percent were females. The study findings showed that a majority the teachers in Narok North sub-county were males. This implies that there were more male teachers inclined to the teaching and learning than female counterparts in secondary schools in Narok North sub-county. This was in contrast with the findings of Bernat and Lloyd (2007) who found out in the study that women were more interested in teaching than men.

Age is an important element when determining teachers' pedagogical experience. Omollo, Indoshi and Ayera (2013) stated that the age of Biology teachers showed the level of instructional experience gained over the years in the profession. Therefore, for this study teachers were asked to indicate their age brackets so as to determine whether age of teacher influence integration of ICT. Their responses were tabulated as shown in Table 4.2.

Table 4.2: Age of the respondents

Age Bracket	Frequency	Percent
Less than 30 years	17	37.0
31 - 40 years	27	58.7
41 - 50 years	2	4.3
Total	**46**	**100.0**

The findings presented in Table 4.2 shows that a majority of the teachers (58.7%) were aged between 31 and 40 years, while 37 percent of the teachers were aged 30 years and below, 4.3 percent of the teachers were aged between 41 and 45 years. It can be observed that most of the teachers in public secondary schools were aged below 40 years. Therefore, the findings implied that many younger teachers were likely to have better knowledge in ICT and this facilitated ICT usability in teaching and learning. This agrees with Alufohai and Ibhafidon (2015) that younger teachers were more effective in the integration of ICT due to their flexibility in embracing digitalization. Therefore age of teachers could influence significantly the integration of ICT in secondary schools.

The duration of a profession over years of practice enhance experience. Wangari (2008) stated that for teachers to transform Kenyan schools into e-schools teachers' professionalism was paramount especially when they gain experience through practice. The teachers were asked to indicate the number of years they had been in the teaching profession. The results are presented in Table 4.3.

Table 4.3: Teachers' working experience

No. of years	Frequency	Percent
1 - 5 years	5	10.9
6 - 10 years	31	67.4
Above 10 years	10	21.7
Total	**46**	**100.0**

Table 4.3 shows that 67.4 percent of the teachers in public secondary schools had a teaching experience of between 6and 10 years, while only 10.9 percent of the teachers had a teaching experience of five years and below. It emerged that most of the teachers in the study area had a teaching experience of over six years showing that they have been in the teaching profession for a significant period.

4.4 ICT training of teachers and integration of ICT

The first objective of the study was to establish the influence of training of teachers on ICT integration in public secondary schools. To achieve this objective, descriptive and Pearson Correlation analysis was used to determine whether the ICT Training of Teachers influences the ICT integration and the results are presented in subsequent sections. The teachers were requested to indicate whether their schools offered ICT training programme. The results are presented in Figure 4.1.

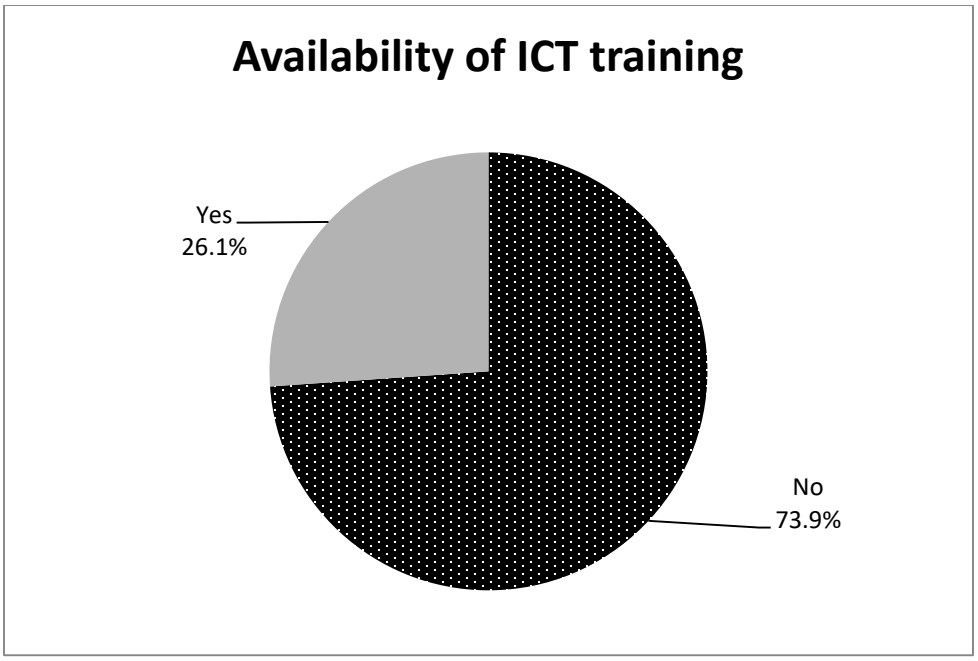

Figure 4.1: Availability of ICT training programmes in schools

Majority of teachers 73.9 percent reported that their schools did not have ICT training programmes for their teachers while 26.1 percent reported that their schools had ICT training programmes. From the responses, it emerged that majority of the schools did not have ICT training programmes for their teachers. This implies that teachers may not be having access to school sponsored programmes on ICT use and implementation. Lack of administrative support in ICT training for teachers hampers the integration of ICT process.

Similarly, teachers were asked to indicate whether or not ICT integration was part of their pedagogical training. Their responses were as shown in Figure 4.2.

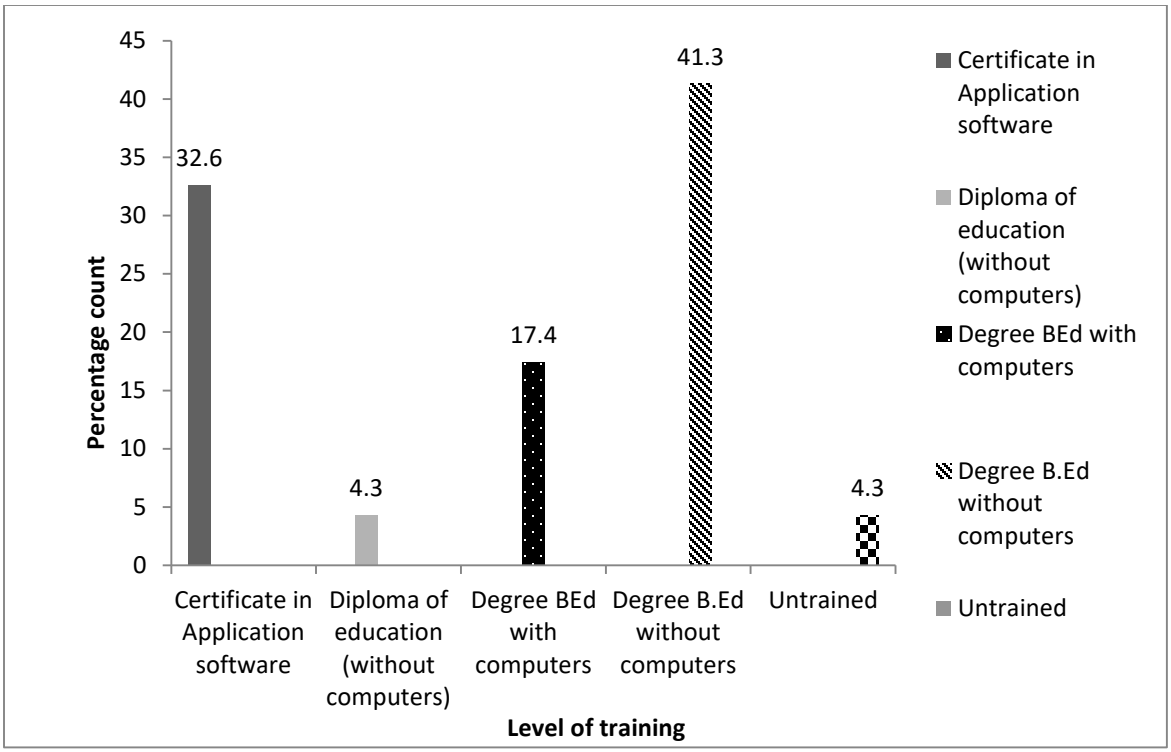

Figure 4.2 Teachers' highest ICT qualification

Data presented in Figure 4.2 showed that only a few teachers agreed that ICT integration was part of their pedagogical training. This was shown by 17.4 percent of the teachers who indicated the during their Bachelors degree in education they trained in computer, 41.3 percent teacher's pre-training did not offer computer training. 32.6 percent of the teacher trained on certificate in application software while 4.3 percent were untrained in ICT related courses. The findings showed that although pre-training of secondary school teachers did not make emphasis on ICT training, a majority of the teachers were able to integrate ICT because of the in-service training acquired while in professional practice.

Therefore, school administration need to facilitate ICT training and refresher courses to ensure that teachers are up-to-date on ICT integration during instructional process. Peeraer and Petergem (2011) stated that offering in-service training, seminars and workshops help improve the use of ICT in education. Thus, the researcher requested the teachers to indicate whether they attend ICT integration training and other refresher courses in computer studies. Table 4.4 presents the study findings.

Table 4.4: Teachers' attendance of ICT training and refresher

		Frequency	**Percent**
Refresher courses in computer studies	Yes	32	69.6
	No	14	30.4
Total		**46**	**100.0**
Training on ICT integration	Yes	33	71.7
	No	13	28.3
Total		**46**	**100.0**

Data contained in Table 4.4 showed that most of the teachers (69.6%) indicated that their school administration offer refresher courses in computer studies while a majority of them (71.7%) indicated that they were trained on ICT integration. This showed that most of the school principals were committed in their role in supporting teachers' in-service training to increase their level of professionalism as well as better their skills in ICT integration. The findings implied that many secondary schools had basic training on ICT thus they were competent on the

integration of ICT. This confirms with the Ministry of Education Science and Technology (MOEST, 2013) directive that school administrators should support their teachers on ICT integration through refresher courses, seminars and workshops in order to improve their training on ICT integration. This concurs with what was established during interviews with principals of secondary schools. Principals A had this to say “We always support out teachers through refresher courses and other aspects related to ICT.” The above narration implies that schools were embracing technology in the teaching and learning. On a contrary opinion Principal B stated that refresher courses and workshops for teachers were not regularly offered due to limited funds to facilitate for the trainings. Thus, refreshment was only done when affordable options were available. This implies that possible chances of in-services training on ICT were rarely offered to enable teachers integrate ICT in teaching and learning.

Teachers were asked to indicate the total time they have been involved during the past two school years in ICT training as part of professional development opportunities. Their responses were tabulated and the results are presented in Table 4.5.

Table 4.5: Duration of training in ICT

	Frequency	Percent
Two weeks	14	30.4
One month	6	13.0
Three months	13	28.3
Over 3 months	6	13.0
No training	7	15.2
Total	**46**	**100.0**

The findings showed that 30.4 percent of the teachers had been involved in ICT training for two weeks, 13 percent one month and 15.2 percent had been involved in ICT training for three months, while 13.0 percent had been involved in ICT training for a period of over three months. From the responses, it emerged that most the teachers had undergone very short courses on ICT training for the past two years in their schools. This hinders effective the integration of ICT in the teaching and learning in public secondary schools. The study findings disagree with (MOHRD, 2012) whose policy recommended that secondary school teachers in India should undergo ICT training to increase technological literacy for not less than one year.

Teachers were requested to indicate whether or not they had undergone any ICT training in some specific areas. Their responses were tabulated and results presented in Table 4.6.

Table 4.6: Responses on teachers' ICT training on specific areas in computer studies

	Yes		No	
Area of training	**F**	**%**	**F**	**%**
Introductory courses on internet use and general applications (basic Word-processing, spreadsheets, presentations, databases, etc.)	21	45.7	25	54.3
Advanced courses on applications (advanced word-processing, complex relational databases, Virtual Learning Environment etc.)	8	17.4	38	82.6
Advanced courses on internet use (creating websites/home page, video conferencing, etc.)	2	4.4	44	95.7
Courses on the pedagogical use of ICT in teaching and Learning	12	26.1	34	73.9
Subject-specific training on learning applications (tutorials, simulations, etc.)	9	19.6	37	80.4
Course on multimedia (using digital video, audio equipment, etc.)	15	32.6	31	67.4
Participate in online communities (e.g. face book, mailing lists, twitter, blogs) for professional discussions with other Teachers	29	63.0	17	37.0
ICT training provided by school staff	9	19.6	37	80.4

Table 4.6 shows that a majority of the teachers (54.3 percent) had not undergone any training on Introductory courses on internet use and general applications in basic Word-processing, spreadsheets, presentations, databases, among other. Also an overwhelming majority (82.6 percent)indicated that they had not undertaken advanced courses on applications which included advanced word-processing, complex relational databases, and Virtual Learning Environment. 95.7 percent of

teachers had also not trained in advanced courses on internet use like creating websites/home page, and video conferencing, and 73.9 percent had not undertaken courses on the pedagogical use of ICT and subject-specific training on learning applications including tutorials, simulations among others.

On the other hand, a majority (63.0%) of the teachers had undergone training on participation in online communities (e.g. face book, mailing lists, twitter, blogs) for professional discussions with other teachers. From the responses, it is clear that most teachers lack training on basic ICT skills and this has an effect on integration of ICT. The findings concur with Cox and Marshall (2007) cited in Naicker (2010) that training programs should prepare and provide support for the teachers and challenge their pedagogical beliefs regarding the way they teach and how they can use ICTs to enhance and support the way students are taught.

Further, teachers were requested to indicate whether ICT training attended covered integration skills. Table 4.7 presented the study findings.

Table 4.7: Areas of training on ICT integration covered by teachers

Training areas		Frequency	Percent
ICT in education pedagogy	Yes	20	43.5
	No	26	56.5
Total		**46**	**100.0**
ICT integration skills	Yes	12	26.1
	No	34	73.9
Total		**46**	**100.0**
Software and hardware	Yes	8	17.4
	No	38	82.6
Total		**46**	**100.0**
Curriculum management	Yes	42	91.3
	No	4	8.7
Total		**46**	**100.0**
Computer skills	Yes	35	76.1
	No	11	23.9
Total		**46**	**100.0**

Data in Table 4.7 showed that majority of the teachers (56.5%) had not trained on ICT in education pedagogy, 73.9 percent had also not undergone through training on ICT integration skills, while 82.6 percent were yet to train on software and hardware. However, 91.3 percent of the teacher had trained on curriculum management and 76.1 percent had trained on computer skills. It was observed that many teachers in secondary schools were trained on basic use of computers because of their short courses training but a majority of them were not trained on essential skills necessary for integration of ICT. This agrees with Kay (2006) that lack integration skills during pre-service training hinder teachers'

effective integration of ICT during pedagogical process though most teachers apply computer skills acquired during pre-service which are not essential for effective ICT integration. Therefore, teachers need to train on specific skills necessary for ICT integration.

Teachers were issued with statements showing the influence of ICT training on ICT integration, they were expected to show the level of agreement to the statement using a four point Likert scale where SD= Strongly disagree, D = Disagree, A = Agree and SA = Strongly Agree. Their responses were tabulated and presented as shown in Table 4.8.

Table 4.8: Influence of teachers' ICT training on integration of ICT

Statements	SD		D		A		SA	
	F	%	F	%	f	%	f	%
Teachers have basic computer training.	5	10.9	13	28.3	26	56.5	2	4.3
Do not use computer in teaching because of lack of training.	14	30.4	19	41.3	10	21.7	3	6.5
Teachers have attended in-service training/workshops	4	8.7	2	4.3	13	28.3	27	58.7
Computers enhance the quality of teaching and learning	2	4.3	2	4.3	12	26.1	30	65.2
Effectively teach using a computer	4	8.7	9	19.6	15	32.6	18	39.1
Adequate training/ skills in ICT integration	4	8.7	8	17.4	23	50.0	11	23.9
Teachers' ICT training is important in imparting and improving teachers' ICT skills	4	8.7	4	8.7	4	8.7	34	73.9
Training in ICT influence teachers' readiness to use ICT	5	10.9	7	15.2	13	28.3	21	45.7
Incorporate ICT in lessons preparation and teaching	5	10.9	11	23.9	27	58.7	3	6.5
The knowledge gained from ICT training improves the presentation of work	4	8.7	8	17.4	13	28.3	21	45.7
ICT training skills has assisted learners to learn better	1	2.2	5	10.9	17	37.0	23	50.0
Training on ICT integration improve quality of teaching/learning	3	6.5	3	6.5	13	28.3	27	58.7

(n=46)

Data contained in Table 4.8 shows that teachers agreed to different levels on the statements showing the influence of their training on ICT integration in secondary schools. For instance, according to 56.5 percent of teachers, most secondary school teachers have basic computer training, while 41.3 percent disagreed that they do not use computer in teaching because they don't have adequate training. Further 58.7 strongly agreed that there are teachers in their school who have attended in-service training/workshops, and 65.2 percent who strongly agreed that computers enhance the quality of teaching and learning, while 39.1 strongly agreed that they can effectively teach using a computer because half of them had adequate training/ skills in ICT integration. This showed that most of the teachers had the capacity to integrate ICT.

Consequently, 73.9 percent of teachers strongly agreed that ICT training for teachers is important in imparting and improving teachers' ICT skills, which was also backed by 45.7 percent of teachers who strongly agreed that training in ICT influence teachers' readiness to use ICT, though, 58.7 percent disagreed that they incorporate ICT in preparing and in teaching their lessons, despite the fact that 45.7 percent strongly agreed that the knowledge gained from ICT training improves the presentation of work and the 50.0percent who stated that ICT training skills has assisted learners to learn better and 58.7 percent who strongly agree that training on ICT integration has improved the quality of teaching/learning in my school.

The study findings showed that other than training there were other teacher – related factors that hinder secondary school teachers from integrating ICT because of the strong agreement that training helped in their preparation of lessons and other instructional processes. The findings implied that other constraints like time, attitude and resources could have contributed to low integration of ICT as could have been attributed to training. This disagrees with Wangari (2008) who notes that ICT integration suffers from lack or limited technical support in management and preventive maintenance. This suggests that schools do not have the required personnel or technicians and this makes ICT integration a difficult undertaking. Innovation is coordinated when it is utilized in a smooth way to help and stretch out educational programs goals and to draw in students in significant learning. During interviews with the SCQASO had this to say, “Some schools here lack technicians and laboratories for adequate in-service of teachers.”

An analysis was performed to establish the significance of teachers’ training on ICT integration and calculated the analysis of variance (ANOVA) showing the significance of in-service training and ICT training skills on association between teachers’ training and ICT integration in secondary schools. The model was significant (p-value = 0.000) at 0.05 level in showing the linear relationship between the variables. In addition, the F-statistic is significantly higher than 1 therefore showing the model’s suitability in assessing the relationship between

independent (teacher training) and dependent variable (ICT integration). The results are presented in Table 4.9.

Table 4.9: Analysis of Variance on teachers' training and ICT integration

		Sum of Squares	df	Mean Square	F	Sig.
In-service training /workshop	Between Groups	7.074	1	7.074	9.837	.003
	Within Groups	31.643	44	.719		
	Total	38.717	45			
ICT training skills better learning	Between Groups	.005	1	.005	.008	.930
	Within Groups	26.430	44	.601		
	Total	26.435	45			

a Predicators: (constant) in-service training/workshops, ICT training skills for better teaching and learning

b Dependent variable: Integration of ICT

To show the relationship between the independent variable (teachers' training) and the dependent variable (integration of ICT) Pearson correlation was sought in terms of technology literacy, knowledge deepening and knowledge creation looking whether the Correlation Coefficient was significant at 0.05 and 0.01 level of significance (2-tailed). To understand the influence of ICT training of teachers on Technology Literacy during ICT integration in public secondary schools, Pearson Correlation analysis was performed. The results were as presented in Table 4.10.

Table 4.10: Pearson's correlation between teachers' ICT training and technology literacy

			Technology Literacy	Training
Pearson	Technology Literacy	Correlation Coefficient	1.000	.399**
		Sig. (2-tailed)	.	.006
	Training	Correlation Coefficient	.399**	1.000
		Sig. (2-tailed)	.006	.

**. Correlation is significant at the 0.01 level (2-tailed). n = 46

There was a positive significant correlation between ICT training of teachers on technology literacy (r=.399, *n*=46, p<.05]). This indicated that training of teachers on ICT influences technology literacy among teachers in public secondary schools. This implies that the level of training affects ICT integration in the teaching and learning. Researchers such as Ropp, (1999) and Gan, Chew, Soh, Mah and Reid (2001) have found out that training is one of the pertinent factors that contribute to the usage of computers. Teachers need to be computer literate and thus should be given appropriate training in computer usage. In addition, training plays an important role in a teacher's readiness to use computers.

Pearson Correlation analysis was done to understand the influence of ICT training of teachers on knowledge deepening during ICT integration in public secondary schools. The results are presented in Table 4.11.

Table 4.11: Correlation between teachers' ICT training and knowledge deepening

			Knowledge deepening	Training
Pearson's	Knowledge deepening	Correlation Coefficient	1.000	-.625**
		Sig. (2-tailed)	.	.000
	Training	Correlation Coefficient	-.625**	1.000
		Sig. (2-tailed)	.000	.

**. Correlation is significant at the 0.01 level (2-tailed). b. Listwise N = 46

There was a negative correlation between training of teachers on ICT and knowledge deepening (r= -.625, *n*=46, p<.05). This indicated that training of teachers on ICT negatively influences knowledge deepening among teachers in public secondary schools. To confirm this Principal C said, "Sometimes it's like a waste of money. We sponsor teachers for training but when some come back they not able to integrate ICT in the teaching of their subject.

Pearson Correlation analysis was performed to understand the influence of ICT training of teachers on knowledge creation during ICT integration in public secondary schools. The results are presented in Table 4.12.

Table 4.12: Pearson's correlation between teachers' ICT training and knowledge creation

			Creation	Training
Pearson's	Creation	Correlation Coefficient	1.000	.350*
		Sig. (2-tailed)	.	.017
	Training	Correlation Coefficient	.350*	1.000
		Sig. (2-tailed)	.017	.

*. Correlation is significant at the 0.05 level (2-tailed). b. Listwise N = 46

There was a positive significant correlation between ICT training of teachers on knowledge creation (r= .350, *n*=46, p<.05]). This indicated that training of teachers on ICT influences knowledge creation of teachers in public secondary schools. This agrees with Naicker, (2010) that training programs prepare and provide support for the teacher's pedagogical approaches regarding the way they teach and use ICTs to enhance students teaching.

4.5Age of teachers and ICT integration

The second objective was to establish the influence of age of teachers on ICT integration in public secondary schools in Narok North sub-county. To achieve this objective, descriptive and Pearson Correlation analysis was used to determine whether age of teachers influence ICT integration. Teachers were asked to indicate their level of agreement on the influence of teachers' age on ICT integration. The results were presented in Table 4.13.

Table 4.13: Level of the influence of teachers' age on ICT integration

	Frequency	Percent
Strongly Agree	14	30.4
Agree	25	54.3
Disagree	3	6.5
Strongly Disagree	4	8.7
Total	**46**	**100.0**

Table 4.13 shows that 84.7 percent of teachers strongly agree and agree that the level of teachers' age influence ICT integration. The findings concur with Peeraer and Petegem (2011) that teachers' age can impact usage of ICT in teaching among educators especially among the individuals who were conceived in the realm of advances or late adopters who got to innovations all the more as of late.

Teachers were issued with statements showing the influence of teachers' age on ICT integration. Table 4.14 shows teachers' responses of the distribution of teachers' competence on ICT integration across various ages.

Table 4.14: Influence of teachers' age on ICT integration

	Below 30 years		31 – 50 years		51 – 60 years		None of the age brackets		All age brackets	
	F	**%**	**f**	**%**	**F**	**%**	**F**	**%**	**f**	**%**
Teachers who mostly integrate ICT in teaching are those aged	15	32.6	23	50.0	4	8.7	2	4.3	2	4.3
Teachers who have attended in-service training are those of age	14	30.4	31	67.4	1	2.2	0	0.0	0	0.0
Teachers who have high interest in ICT integration are those of age	34	73.9	12	26.1	0	0.0	0	0.0	0	0.0
Teachers who have challenges in ICT integration are teachers aged	0	0.0	8	17.4	38	82.6	0	0.0	0	0.0

Information contained in Table 4.14 shows that age of the teacher was a determining factor on the integration of ICT during the pedagogical process. This was shown by half of the teachers who indicated that teachers who mostly integrate ICT in teaching are those aged between 31 and 50 years. 67.4 percent of the teachers, their counterparts aged between 31 to 50 years have attended in-

service training on ICT training while 73.9 percent indicated that teachers below 30 years have high interest in ICT integration. 82.6 percent of the teachers their counterparts in 51 to 60 years old have challenges in ICT integration. The findings show that teachers' age determined their interest in integration of ICT. The findings concur with Ruthven et al., (2010) who argued that older teachers lack experience or fear usage of ICT facilities. The older feel apprehensive by the new innovations than the young group.

To show the relationship between the independent variable (teachers' age) and the dependent variable (integration of ICT) Pearson correlation was determined in terms of technology literacy, knowledge deepening and knowledge creation looking whether the Correlation Coefficient was significant at 0.05 and 0.01 level of significance (2-tailed). To understand the influence of teachers' age on technology literacy during ICT integration in public secondary schools, Pearson Correlation analysis was done. The results are presented in Table 4.15.

Table 4.15: Pearson's correlation between age of teachers and technology literacy

			Technology Literacy	Teachers age
Pearson's	Technology Literacy	Correlation Coefficient	1.000	.516**
		Sig. (2-tailed)	.	.000
	Teachers Age	Correlation Coefficient	.516**	1.000
		Sig. (2-tailed)	.000	.

**. Correlation is significant at the 0.01 level (2-tailed).b. N = 46

There was a strong significant correlation between teachers age and technology literacy (r=.516, *n*=46, p<.05]). This implies that teachers age in teaching influences technology literacy among teachers in public secondary schools.

Pearson Correlation analysis was performed to understand the influence of ICT training of teachers on knowledge deepening during ICT integration in public secondary schools. The results are presented in Table 4.16.

Table 4.16: Pearson's correlation between age of teachers and knowledge deepening

			Knowledge Deepening	Teachers age
Pearson's	Knowledge Deepening	Correlation Coefficient	1.000	-.236
		Sig. (2-tailed)	.	.115
	Teachers Age	Correlation Coefficient	-.236	1.000
		Sig. (2-tailed)	.115	.

According to analysis presented in Table 4.16 there was no significant correlation between age and knowledge deepening (r= - .236, *n*=46, p<.05]). This implies that teachers' age does not influence knowledge deepening among teachers in public secondary schools.

Pearson Correlation analysis was performed to understand the influence of teachers' age on knowledge creation during ICT integration in public secondary schools in Narok North sub-county. The results are presented in Table 4.17.

Table 4.17: Correlation between age of teachers and knowledge creation

			Knowledge Creation	Teachers age
Pearson's	Knowledge Creation	Correlation Coefficient	1.000	.070
		Sig. (2-tailed)	.	.645
	Teachers age	Correlation Coefficient	.070	1.000
		Sig. (2-tailed)	.645	.

a. N = 46

According to analysis presented in Table 4.17 there was no significant correlation between teachers age and knowledge creation (r= .070, *n*=46, p>.05]). This implies that age does not influence knowledge creation of teachers in public secondary schools. The findings imply that teaching age influence on technology literacy but do not influence knowledge deepening and knowledge creation. This agrees with Russell, Bebell and Tao, (2007), that the quality of ICT integration was related to the years of teacher's service. However, Baek, Jong and Kim (2008), claim that aged teachers are less ready to integrate ICT into their teaching.

4.6Gender of teachers and integration of ICT

The third objective of this study was to determine the influence of the gender of teachers on integration of ICT in public secondary schools in Narok North sub-county, Kenya. To achieve this objective, descriptive and Pearson Correlation analysis was used to determine whether gender of teachers influence the ICT integration. Teachers were asked to indicate their level of agreement on the influence of teachers' gender on ICT integration. The results were presented in Table 4.18.

Table 4.18: Influencing teacher's gender on use of ICT technology

Responses	Frequency	Percent
Strongly Agree	4	8.7
Agree	21	45.7
Disagree	9	19.6
Strongly Disagree	12	26.1
Total	**46**	**100.0**

The results presented in Table 4.18 shows that most of the teachers (45.7%) agreed that teachers gender influence use of ICT which translate to the relationship between gender and ICT integration. This implied that teachers were divided between gender and integration of ICT. The results showed ICT integration was gender biased. Teachers were requested to indicate the extent to

which teachers' gender influences ICT integration in public secondary school. Table 4.19 presented the study findings.

Table 4.19: Extent to which teachers' gender influence ICT integration

Rate	Frequency	Percent
To a great extent	2	4.3
Moderate extent	23	50.0
Little extent	9	19.6
No extent at all	12	26.1
Total	**46**	**100.0**

Table 4.19 shows that half of the teachers reported that gender influenced ICT integration to a moderate extent. Teachers were issued with statements showing the influence of teachers' gender on ICT integration. They were expected to show the level of agreement to the statement using a four point Likert scale where female, male, all or none integrate ICT in teaching and learning. Their responses were tabulated and presented as shown in Table 4.20.

Table 4.20: Influence of teachers' gender on ICT integration

	Female		Male		All		None	
	F	%	F	%	f	%	F	%
Teachers who mostly integrate ICT in teaching	3	6.5	25	54.3	18	39.1	0	0.0
Teachers who own ICT facilities like laptops are mainly	1	2.2	25	54.3	18	39.1	2	4.3
Teachers who type their notes and exams using computers are mostly	28	60.9	17	37.0	1	2.2	0	0.0
Teachers who have ICT training are mostly	19	41.3	22	47.8	2	4.3	3	6.5
Teachers who have high interest in integration of ICT	12	26.1	30	65.2	3	6.5	1	2.2

Information contained in Table 4.20 showed that 54.3 percent of teachers indicated that males mostly integrate ICT in teaching, while 54.3 percent own ICT facilities like laptops. This showed that access to ICT facilities enhanced male teachers' likelihood to integrate IT in pedagogical processes.

On another instance, 60.9 percent of teachers indicated that female teachers type their notes and exams using computers as compared to male teachers. However, the percent of male and female teachers trained in ICT was relatively equal. This showed that ICT training was not gender biased, though, 65.2 percent of teachers indicated that male teachers had high interest in integration of ICT. The findings agree with Dorothea, Hollow and Pervuda (2014) who contend that gender disparity starts from early tutoring when guardian's support and offer young men better chances over girls. Omollo, Indoshi and Ayera (2013) contend that instructors' preparation to receive and utilize technologies in teaching change starting with one gender then onto the next; among females and male educators.

A cross tabulation was conducted to show the relationship between teachers' gender and ICT qualification. This cross tabulation was expected to show the relationship between teachers' gender and ICT integration. Table 4.21 shows the study findings.

Table 4.21: Cross tabulation of teachers' gender * highest ICT qualification

		Highest ICT qualification					Total
		Certificate in Application software	Diploma of education (without computers)	Degree BEd with computers	Degree BEd without computers	Untrained	
Gender	Male	6	2	6	15	2	31
	Female	9	0	2	4	0	15
Total		**15**	**2**	**8**	**19**	**2**	**46**

Data in table 4.21 shows that more female teachers were trained at certificate level in application software while there were more male teachers who had trained in Bachelors of Education with ICT. This showed that male teachers were more exposed to ICT training as compared to female teachers. It was observed that more male teachers used ICT resources in teaching in secondary schools, thus, teachers gender was found to influence teachers' integration of ICT in public secondary schools. During interview with SCQASO it was established that more male teachers than females used ICT in teaching. This is what the respondents were in most schools that we do inspection, we had more male teachers embracing technology. It is a question of attitude and not availability of ICT resources. This narrative implies that the Government support for ICT use and e-schools in paramount to ensure that secondary schools integrate ICT in teaching and learning.

Pearson Correlation analysis was used to determine whether there was significant relationship between gender and the three determinants of ICT integration (technology literacy, knowledge deepening and knowledge creation). This was achieved by looking whether the Correlation Coefficient was significant at 0.05 and 0.01 level of significance (2-tailed). The study sought to determine the influence of gender of teachers on technology literacy in public secondary schools. The results are presented in Table 4.22.

Table 4.22: Correlation between teachers' gender and technology literacy

		Technology Literacy	Gender of respondent
Technology Literacy	Correlation Coefficient	1.000	.316*
	Sig. (2-tailed)	.	.033
Gender of Respondent	Correlation Coefficient	.316*	1.000
	Sig. (2-tailed)	.033	.

*. Correlation is significant at the 0.05 level (2-tailed).

There was a significant correlation between gender and technology literacy (r=.316, *n*=46, p<.05]). The results show that gender influences technology literacy among teachers in public secondary schools. This agrees with Mwebaze and Quinn (2010) that male and female teachers in Africa, are not equally likely to be trained to use ICT in classrooms; moreover, male teachers are more likely to be trained to teach basic computer skills and computing.

The influence of gender and knowledge deepening was investigated using Pearson's Correlation as summarized in Table 4.23.

Table 4.23: Pearson's correlation between teachers' gender and knowledge deepening

			Knowledge Deepening	Gender of Respondent
Pearson	Knowledge Deepening	Correlation Coefficient	1.000	.082
		Sig. (2-tailed)	.	.588
	Gender of respondent	Correlation Coefficient	.082	1.000
		Sig. (2-tailed)	.588	.

a. N = 46

The analysis in Table 4.23 shows that there was no significant relationship between gender and knowledge deepening [r=.082, *n*=46, p>.05]. This implies that there is no relationship exist between gender and knowledge deepening in ICT integration. Thus, the finding show that the gender of the teacher does not have significant influence the integration of the ICT .

The influence of gender and knowledge creation was investigated using Pearson's correlation as summarized in Table 4.24.

Table 4.24: Correlation between teachers' gender and knowledge creation

			Creation	Gender of respondent
Pearson	Creation	Correlation Coefficient	1.000	-.032
		Sig. (2-tailed)	.	.834
	Gender of respondent	Correlation Coefficient	-.032	1.000
		Sig. (2-tailed)	.834	.

a. N = 46

According to the findings in Table 4.24, there was no significant relationship between gender and knowledge creation (r= -.032, n=74, p>.05). The gender of the teacher does not influence the knowledge creation in integration of ICT. This implies that there was significant relationship between gender of the teacher and technology literacy. However no significant relationship exists between gender and knowledge deepening as well as knowledge creation. This shows that the integration of ICT in the teaching and learning from the perspective of technology literacy was dependent on gender of the teacher. This agrees with Bowser-Brown (2004) that female students are more likely to enter programmes with few technology skills due to lack of access. There is evidence to show that this disparity continues at the tertiary level in Africa. A study undertaken under

the Pan African Research Agenda (2012) on the Pedagogical Integration of ICT in Africa showed that females had lower rates of ICT usage than males.

4.7 ICT Integration in secondary education

The dependent variable in the study was ICT integration in the teaching and learning. In order to understand ICT integration in the teaching and learning, the study sought to establish the extent to which technology literacy, knowledge deepening and knowledge creation constructs influence ICT integration in the teaching and learning process. The respondents were required to respond to various indicators of technology literacy, which included the ICT integration as a teaching policy in school, years of experience using computers in school, time spend in using computers and extent of confidence in Computer use in Particular areas. The respondents were asked to indicate whether ICT integration was part of the teaching policy in their schools. The results of data analysis are presented in Figure 4.3.

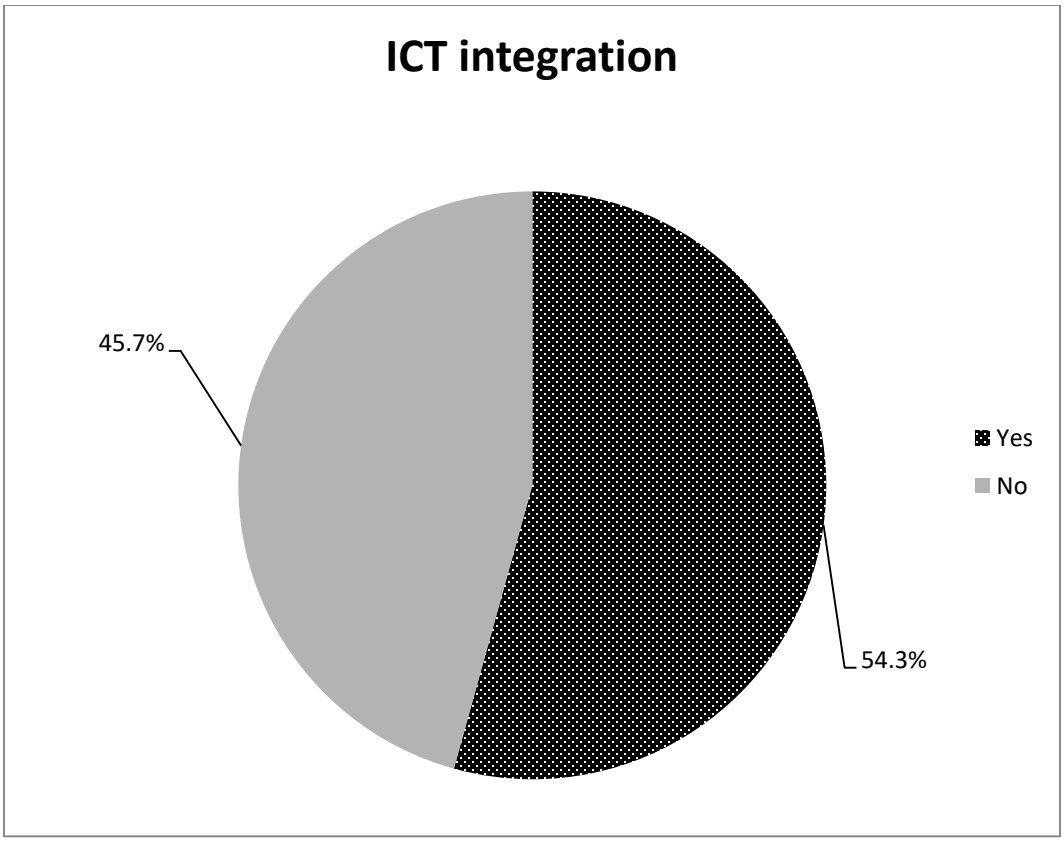

Figure 4.3: ICT Integration as a teaching policy in school

The analysis in Figure 4.3 shows that 54.3 percent of the teachers agreed with the statement that ICT integration was part of the teaching policy in their schools, while 45.7 percent disagreed. This implies that the teaching and learning process in schools was dependent of ICT integration. The findings agree with Odera (2011) who reported that the recent past has witnessed a huge investment in computer education in schools, colleges and universities around the world. This was a result of globalization and ICT policy in Kenya which came into force in 2005 through the Sessional Paper No 1 of 2005 (GOK, 2005).In addition, the

respondents were asked to indicate the number of years they have been using computers and/or the internet in school. The responses are presented in Figure 4.4.

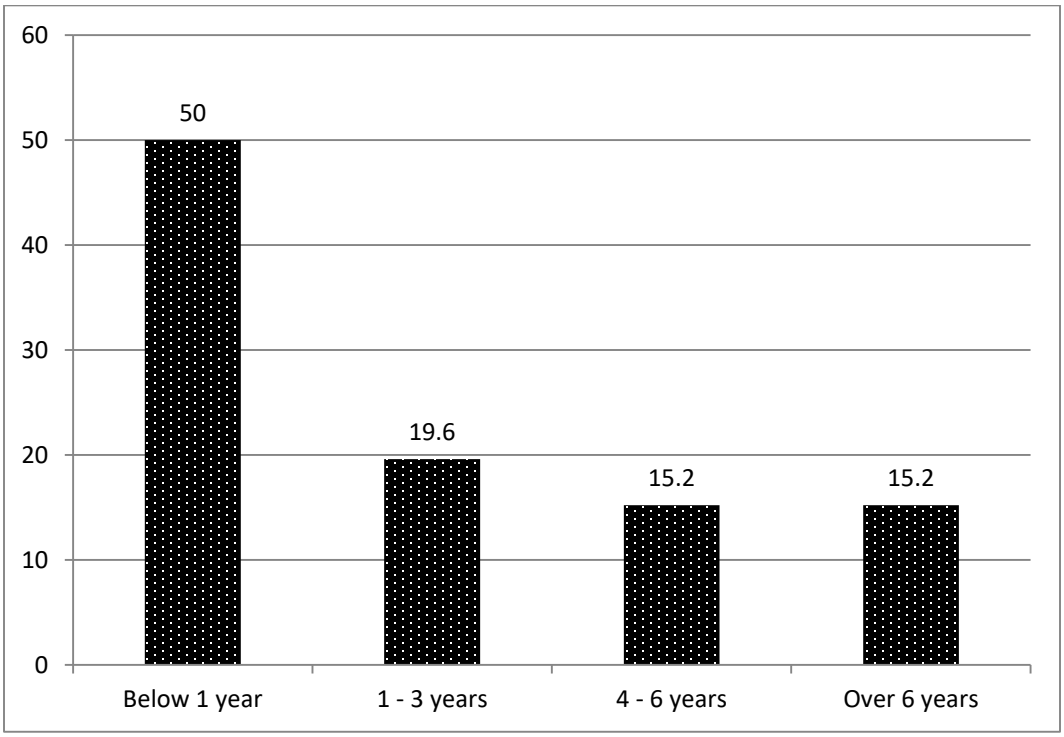

Figure 4.4: Years of experience using computers in school

The analysis in Figure 4.4 shows that 50.0 percent of the teachers had used computers for a period of 1-3 years, 19.6 percent for 4-6 years and 7(15.2%) for less than one year while 15.2 percent of the teachers had used computers for a period of more than 6 years. This implies that most of the teachers in secondary schools had used ICT for a period of between 1 and 3 years and this is a clear indication that integration of ICT in secondary schools was still at take off stage

or who still at implementation stage. This showed that integration of ICT in schools was still new. This supports the work of Mikre (2011) that in recent years there has been a growing interest to know how computers and internet can best be utilized to improve effectiveness and efficiency of education at all levels in formal and non-formal settings.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter contains a summary of the study findings, conclusions, recommendations and suggestions for further research based on the analysis of data. The chapter is divided into four sections namely: summary of research findings, conclusions, recommendations and suggestions for further research. These divisions were informed by the purpose of the study and the results.

5.2 Summary of the major findings

The purpose of this study was to investigate teacher-related factors influencing integration of Information Communication Technology in the teaching and learning in public secondary schools in Narok North sub-county, Kenya. The specific objectives were to determine the influence of gender, ICT training and age of teachers on integration of ICT.

5.2.1 On the influence of training of teachers on ICT integration

The study established that most schools do not have ICT training programmes. This hampered the integration of ICT in the teaching and learning in secondary schools. Further the findings that most the teachers had not undergone any ICT training for the past two years in their schools. This implies that is hindered by lack of regular training for the integration of ICT in the teaching and learning in public secondary schools. Therefore, it can be shown that teachers lack training on basic ICT skills and this has an effect on integration of ICT. There was a

positive and significant correlation between training and technology literacy, training and knowledge deepening and training and knowledge creation. This implies that the level of training affects ICT integration in the teaching and learning.

5.2.2 On the influence of age of teachers on ICT Integration

The second objective of this study was to establish the influence of age of teachers on ICT integration in public secondary schools. The study established that there was a significant positive correlation between age and technological literacy. The study found out that most of the teachers in the study area had a teaching age over years showing that they have been in the teaching profession for a long time. In addition, there was a significant positive correlation between teaching age (r=.561) and technology literacy. However, there was no significant correlation between work age and knowledge deepening and work age and knowledge creation. This implies that teachers' age influence on technology literacy but does not influence knowledge deepening and knowledge creation.

5.2.3On the influence of gender on integration of ICT

The study found out that there was a significant correlation between gender and technology literacy (r=.316; p=.033). However, there was no significant relationship between gender and knowledge deepening (r=.082; p=.588) and gender and knowledge creation (r=.032; p=.834). From the results, it seems therefore that gender influences technology literacy but it does not influence

knowledge deepening and knowledge creation among teachers in public secondary schools.

5.3 Conclusions of the study

Based on the study findings it can be concluded that the gender of teachers influences technology literacy but it does not influence knowledge deepening and knowledge creation among teachers in public secondary schools. The age of teachers influences ICT use which relates to technology literacy and also influence knowledge deepening and knowledge creation among teachers in public secondary schools in Narok North Sub-county. Therefore, it can be concluded that older teachers do not integrate ICT during their pedagogical process a notion that is contrary with younger teachers. The level of ICT training influences positively technology literacy, training and knowledge deepening and training and knowledge creation in ICT integration for teaching and learning. The teaching experience influences technology literacy but does not influence knowledge deepening and knowledge creation.

5.4 Recommendations from the study

The following recommendations are made based on the study findings;

- The Ministry of Education need to support teachers training in integration of ICT for both male and female teachers to be encouraged to develop ICT literacy through training to enable them integrate ICT for teaching thus enhancing on students' achievement of set goals.

- Secondary school principals should provide adequate ICT facilities and resources because teachers did not have access to computer equipment for use in the teaching and learning process. Therefore, computer equipment need to be availed to all student and teachers in order to enhance its use during learning process that will empower them with skills and content to use them in actual teaching practice. Schools should ensure that they equip computer labs with adequate facilities.
- The policy and decision makers in Government must implement those policies and decisions that favour literacy in the ICTs particularly provision of infrastructure and ICT components to schools.
- Teacher Training Colleges (TTC) should ensure that ICT has to be integrated into the teacher education programmes to ensure teachers' preparedness during pre-service to ensure that they adopt use of ICT at the classroom level.
- KICD should develop a standard planned ICT practical course curriculum of one sit-in exams for teacher education programmes should be developed and maintained to ensure that graduates of teacher training programme are professionally competent on completion of the programme.

5.5 Suggestions for further research

- There is need for a study on factors influencing the integration of ICT in education especially in teacher-training colleges.

- There is need for a study on factors influencing the integration of ICT in education in the primary schools
- There is need for a study of other factors affecting teachers' integration of ICTs in secondary schools
- There is need for study on influence of ICT integration on students' achievement in secondary schools.

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APPENDIX I: INTRODUCTION LETTER TO THE RESPONDENTS

University of Nairobi,
Department of Educational Foundations
P.O. Box 30197,
NAIROBI.

Dear Respondent,

RE: Request for Filling of Questionnaires for Research Purposes

I am a post-graduate student undertaking Masters Degree in Educational foundations at the University of Nairobi. I am currently carrying out a research project for the purpose of investigating ***Influence of Teacher related Factors*** on ***Integration of Information and Communication Technology (ICT) in Public Secondary Schools in Narok North Sub-County, Kenya.***

The information provided will be used for academic purposes only and will be treated with utmost confidentiality. I therefore request you to fill the questionnaire attached here-in and return to me for analysis. Do not write your name on the questionnaire.

Thank you

Yours sincerely,

Langat Kipkorir

Reg No.: E55/85209/216

APPENDIX II: QUESTIONNAIRE FOR TEACHERS

Section A: Demographic Information

1. Indicate your Gender: Male [ ]

Female [ ]

2. What is your age bracket?

(a) Less than 30 years [ ]

(b) 31– 40 years [ ]

(c) 41–50 years [ ]

(d) Over 50 years [ ]

3. For how long have you been working in this school?

1 Below 1 Year [ ]

2 1-5 Years [ ]

3 6-10 years [ ]

4 Above 10 Years [ ]

Section B:ICT training of teachers and integration of ICT

4. Indicate your highest ICT qualification. Tick (✓)

1 Certificate in Application software [ ]

2 Diploma in education (without computer) [ ]

3 Diploma in education (with computer) [ ]

4 Degree e.g. B.ed (with computer as teaching or core subject) [ ]

5 Degree e.g. B.ed (without computer as teaching or core subject) [ ]

6 Masters [ ]

7 Untrained [ ]

5. Have you attended any refresher courses in computer studies?

Yes [ ]

No [ ]

6. Have you undertaken any training on ICT integration in your career?

Yes [ ]

No [ ]

7. Kindly indicated the specific areas in computer studies you have training on

Area of training	**Yes**	**No**
Introductory courses on internet use and general applications (basic Word-processing, spreadsheets, presentations, databases, etc.)		
Advanced courses on applications (advanced word- processing, complex relational databases, Virtual Learning Environment etc.)		
Advanced courses on internet use (creating websites/home page, video conferencing, etc.)		
Courses on the pedagogical use of ICT in teaching and Learning		
Subject-specific training on learning applications (tutorials, simulations, etc.)		
Course on multimedia (using digital video, audio equipment, etc.)		
Participate in online communities (e.g. face book, mailing lists, twitter, blogs) for professional discussions with other Teachers		
ICT training provided by school staff		

8. What areas of training on ICT integration have you been trained?

- ICT in Education pedagogy [ ]

- ICT integration skills [ ]
- Software and hardware [ ]
- Curriculum management [ ]
- Computer Skills [ ]
- Any other ……

8. What was the duration of the training you attended?

   i. Two weeks [ ]

   ii. One month [ ]

   iii. Three months [ ]

   iv. Any other……

9. Indicate with a tick (✓) the extent to which you agree with each of the statements listed here below with relation to the influence of teacher related factors on ICT integration on a scale of 1-4. Where 4-Strongly Agree, 3-Agree, 2-Disagree, 1-Strongly Disagree.

Statements	**1**	**2**	**3**	**4**
Most secondary school teachers have basic computer training.				
I do not use computer in teaching because I don't have adequate training.				
There are teachers in my school who have attended in-service training/workshops				
Computers enhance the quality of teaching and learning				
I can effectively teach using a computer				
I have adequate training/ skills in ICT integration				

ICT training for teachers is important in imparting and improving teachers' ICT skills				
Training in ICT influence teachers' readiness to use ICT				
I incorporate ICT in preparing and in teaching my lessons				
The knowledge gained from ICT training improves the presentation of work in my class				
ICT training skills has assisted learners to learn better				
Training on ICT integration has improved the quality of teaching/learning in my school				

Section C: Age of Teachers and ICT integration

10. Age influences utilization of ICT .

    Strongly agree [ ] Agree [ ] Disagree [ ] Strongly Disagree [ ]

11. Teachers who mostly integrate ICT in teaching are those aged:

    Below 30years [ ] 31-50 years [ ] 51-60 years [ ] None of the above [ ] All age brackets [ ]

12. Teachers who have attended in-service training are those of age:

    Below 30years [ ] 31-50 years [ ] 51-60 years [ ] None of the above [ ]

13. Teachers who have high interest in ICT integration are those of age

    Below 30years [ ] 31-50 years [ ] 51-60 years [ ] None of the above [ ]

14. Teachers who have challenges in ICT integration are teachers aged

    Below 30years [ ] 31-50 years [ ] 51-60 years [ ] None of the above [ ] All age brackets [ ]

Section D: Teachers gender and integration of ICT in Teaching-learning

15. Gender influences the use of ICT

Strongly agree [ ] Agree [ ] Disagree [ ] Strongly Disagree [ ]

16. To what extent does teacher gender influence ICT integration in teaching in your school?

To a great extent [ ] To a moderate extent [ ] To a little extent [ ]Not at all [ ]

17. Teachers who mostly integrate ICT in teaching are

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

18. Teachers who own ICT facilities like laptops are mainly

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

19. Teachers who type their notes and exams using computers are mostly

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

20. Teachers who have ICT training are mostly:

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

21. Teachers who have high interest in integration of ICT are:

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

Thank you for your participation in the study

APPENDIX III: INTERVIEW FOR PRINCIPALS

How ICT training of teachers affect the integration of ICT in public secondary schools in Narok North Sub-County

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

2. How does your school prepare teachers to integrate ICT ?

3. Are there training for teachers on ICT integration available in your area?

4. Have your teachers attended such trainings?

5. How frequent do ICT training of teachers take place?

6. Comment of teachers' attendance to in-service trainings

7. Give some suggestions on improvement of ICT competence among teachers in your school

8. What criterion is used to invite teachers to training?

9. What is an estimate number of female teachers and male teachers from your school who have attended the training?

10. In your opinion, do the age of teachers influence the integration of ICT integration in the classroom? Briefly explain.

11. Teachers who have attended in-service training are those aged

Below 30years [ ] 31-40 years [ ] 41-50 years [ ] 51-60 years [ ]None [ ] All [ ]

12. Which group of teachers like utilizing ICT.

Below 30years [ ] 31-40 years [ ] 41-50 years [ ] 51-60 years [ ]None [ ] All [ ]

13. Does gender influence teachers use of ICT in their lessons?

14. In your opinion, who between male and female utilize ICT more and why?

15. Do male and female teachers use computers to type note and set exams equally?

16. In your opinion who between female and male teachers have high interest in ICT integration.

17. In your opinion which group of teachers between male and female mostly own ICT facilities like laptops and computers?

18. Briefly comment on the number of male and female teachers who have attended ICT training.

19. In your opinion, is there gender disparity in ICT integration ? If yes how can that be addressed?

APPENDIX IV: INTERVIEW FOR SUB-COUNTY QUALITY ASSURANCE OFFICER

1. In your own opinion what would you say about how availability of ICT infrastructure influences integration of I.C.T in public secondary schools in Narok North Sub-County?

2. In your own opinion what would you say about how teachers' training influences integration of ICT in public secondary schools in the area?

3. In your own opinion what would you say about how teacher competence in ICT influences integration of ICT in public secondary schools?

4. In your own opinion what would you say about how teacher characteristics like age and gender influences integration of ICT in public secondary schools?

5. In your own opinion what would you suggest to be done to enhance integration of ICT in public secondary schools?

Thank you for your participation in the study

APPENDIX V: OBSERVATION CHECKLIST

Equipment/facilities	**Available but inadequate**	**Available and adequate**	**Not available**	**Good working condition**	**Often utilized**	**Remarks**
Internet-Based Access To World-Wide Web (WWW) Resources Interactive Video(Disc And Tape) Printers Laptops Simulation Software Storage Devices Scanner Photographs/ slides Videos Journals/Newspaper Books Realia Desktop computers Fans						

White boards Hub Furniture Electrical fuse Anti-Virus Software Connection cables Technician Computer Laboratory						

APPENDIX VI: RESEARCH PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **607563**

Date of Issue: **16/September/2019**

RESEARCH LICENSE

This is to Certify that Mr.. Langat Wesley of University of Nairobi, has been licensed to conduct research in Narok on the topic: TEACHER RELATED FACTORS INFLUENCING INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY IN PUBLIC SECONDARY SCHOOLS IN NAROK NORTH SUB-COUNTY KENYA for the period ending : 16/September/2020.

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