ASSESSMENT OF PUBLIC PRIMARY SCHOOL TEACHERS PREPAREDNESS IN THE IMPLEMENTATION OF DIGITAL LITERACY PROGRAMME IN PUBLIC PRIMARY SCHOOLS IN IMENTI NORTH SUBCOUNTY KENYA

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A Research Project Submitted in Partial Fulfilment of the Requirements for the Award of Degree in Master of Education in Curriculum Studies.

University of Nairobi

2018

DECLARATION

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

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DEDICATION

I would like to dedicate this work to my dear husband Rev Samuel and my beloved sons Victor Mutugi, Mark Koome and Caleb Mutethia.

ACKNOWLEDGEMENT

I wish to thank the Lord God Almighty for his goodness and mercy upon me during my course studies at the University of Nairobi.

First, I wish to acknowledge with great regards my blessed supervisors, Dr. Rosemary Imonje and Dr. Mercy Mugambi for their scholarly and supportive suggestions, guidance and gracious encouragement without which this work would not have reached its completion, thank you and God bless you.

I wish to thank all those who in one way or another made my course at the University a success, my friends who also gave me moral support. I wish to acknowledge the University of Nairobi particularly the Department of Education Administration and Planning for giving me an opportunity to study and availing all the needed resources to undertake this study to completion. Special thanks to Sylvia Gaita for her invaluable support. My appreciation also would go to Meru extra mural resident lecture and the ICT assistant for allowing me use the university facilities. I appreciate the County Education office, Meru County through the office of Sub County, Imenti North Sub County for their assistance during the time research was conducted in the area. Many thanks to KICD and ICT Authority for their invaluable support. Head teachers and teachers where I collected the data, thank you for your assistance.

TABLE OF CONTENTS

CHAPTER THREE

RESEARCH METHODOLOGY

CHAPTER FOUR

DATA ANALYSIS PRESENTATION AND INTERPRETATION

CHAPTER FIVE

SUMMARY OF STUDY CONCLUSIONS AND RECOMMENDATIONS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

DLP	Digital Literacy Programme
ICT	Information and Communication Technology
KICD	Kenya Institute of Curriculum Development
K.I. E	Kenya Institute of Education
KESSP	Kenya Education Sector Support Programme
MDG	Millennium Development Goals
MoE	Ministry of Education
NCATE	National Council for Accreditation of Teacher Education
TSC	Teachers Service Commission
UNESCO	United Nation Education and Scientific Cultural Organization
UNICEF	United Nations Children Education Fund

ABSTRACT

The purpose of this study was to investigate the preparedness of public primary school teachers in the implementation of digital literacy programme in Imenti North Sub County Kenya. The study was guided by the following objectives; to establish infrastructural availability for the public primary school teachers' usage in teaching and learning in implementation of digital literacy programme in public primary schools in Imenti North Sub County, to examine how public primary school teachers' competence influence implementation of digital literacy program in public primary schools in Imenti North Sub County, The study sought to determine how public primary school teacher perception influence implementation of digital literacy program in public primary schools in Imenti North Sub County. The study also sought to establish how digital literacy content availability for the public primary school teachers influence implementation of digital literacy programme in public primary schools in Imenti North Sub County. The study adopted descriptive research design. The study was grounded on technology diffusion theory to explain the relationship between the independent and dependent variables. The study had a target population of 596 respondents who comprised 59 head teachers and 537 teachers. The respondents were selected using proportionate random sampling technique where by a sample size of 137 was used. Primary data was obtained using self-administered questionnaires that were made up of both open ended and closed ended questions, also unstructured interview was administered face-to-face or over the phone. The reliability of the study was measured using test retest method. The Data was analyzed using Statistical Package for Social Sciences and the data was presented in frequency tables, percentages and regression analysis. The study concluded that preparedness of public primary school teachers in the implementation of digital literacy programme was highly influenced by teacher competence followed by infrastructural preparedness and then by Teacher perception while digital literacy content had the least effect on implementation of digital literacy programme in public primary schools in Imenti North Sub County. The study concluded that infrastructural preparedness influences implementation of digital literacy program in public primary schools in Imenti North Sub County significantly. Even though the schools have electricity their computer lab have not been fully equipped. The implementation of digital literacy program has been delayed by inadequate internet connections coupled with inadequate digital literacy program devices for teaching and learning in the schools. Also, there being inadequate tablets for the learners and laptops for the teachers have negatively affected the implementation of digital literacy program in public primary schools. The study recommends that teachers and instructors need to be trained in basic ICT skills and ICT-based teaching methods to feel comfortable about using the materials. The study recommends that the governments should ensure that all the public primary schools are connected to wireless internet services; that primary schools should be assisted by both national and county government need to ensure that the schools have a complete computer lab that is fully equipped with enough laptops for the teachers and tablets for the learners. The study further recommends that head teachers and parents need to set up administrative committees to manage ICT facilities as proven to be very effective in ensuring the sustainability of initiatives.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Digital Literacy Program (DLP) is said to target the use of digital technology and communications in teaching and learning in primary schools in Kenya. The purpose of the programme is to integrate ICT with the education curriculum so as to enhance effective delivery of learning materials to learners. In the programme, ICT is used as a teaching and learning tool. The authorities of Kenya supposed to put into effect the digital Literacy program (DLP) in 2014 via a multi-organization method that constituted of MoE, science and technology (the undertaking proprietor), TSC, KICD, ICT Authority being the lead enforcing corporation for the program amongst other businesses. DLP is a countrywide software that's being implemented country wide. The point of interest of this system is to enhance learning in Public primary schools in Kenya via the usage of digital technology (Digi school, 2016). In reference to the information given by means of the ICT Authority (2016), via the DLP application the authorities intends to fulfil the promise of; improvement of innovation abilities for a knowledge economy, promote research and improvement. Sell domestically assembled or manufactured goods and offerings and improving job advent.

The key components of this system have been; provision of content for virtual studying, provision of digital gadgets for each novices and teachers, potential improvement for instructors and implementers, status quo of local assembly for virtual devices and associated add-ons and Broadband connectivity (infrastructure). A report by Ag. CEO ICT Authority in a meeting of Kenya Primary School Heads held on 6th December 2017 at Mombasa indicates that over 89.2% of all the public primary schools have been supplied with the DLP devices and over 91000

teachers have been trained on devices utilization, over 95% of schools are connected with power in preparation for the digital literacy program implementation.

In step with the standard assertion of human right of 1948, schooling is a fundamental right for each child and an opportunity to attain and preserve an adaptable degree of studying. Consequently, schooling structures and programs must be designed and implemented considering the particular traits, hobby, abilities and learning needs of each child (UNESCO, 2017). Digital era is extensively identified as a important aid in financial, social and political information conversation technology. The potential to apply digital technology, communication tools, and/or networks accurately to resolve information issues with a purpose to function in an information society is presently properly identified as the important thing Harrison, Rainer and pillar of information and communication technology development, as such, virtual technology performs a big function in accelerating the motion of learning possibilities to all elements of the sector, to novices of all cultures and nationalities, (Hochwarter,2009).

In step with Georgia (2011), within the international arena, know-how in growing attentions is being positioned into using ICT in education everywhere in the international (Yuen et al., 2003) with one of the goal being use of ICT as medium for teaching and studying. Plomp, Anderson, regulation & Quale (2009) posit that technology ought to no longer simply be deemed as an additional system which can be used as a replacement of existing teaching strategies, however as an essential device to aid new ways of coaching and learning. Subsequently, it ought to be used to improve student's competencies for cooperation, conversation, problem solving and lifelong learning.

In this regard, Digital literacy should be considered an important component for integration in the curriculum for children in all parts of the world. Studies highlight that there is preference of technology use among the children of 5 to 15 years old in UK, (Devaux, et. al 2017). Digital literacy is increasingly present in education. For example, countries such as France and Norway have included digital as part of their core curriculum, while many other jurisdictions (including Estonia and England) have included computer coding or programming in primary and secondary classes (Belshaw 2011; Euroactiv 2015). In developed countries, such as Finland traditional curriculum reviewed centring it on learner skills that are needed in the fast-changing technological environment technologies, (Ministry of Education and Culture 2011).

Digital Literacy is specifically at a dynamic level in Africa, this means that that new trends are occurring on a day by day foundation in the continent. The technique of adoption and diffusion of virtual era in training is in transition. One of the fundamental capabilities of this new section being the concern governments are giving to coverage improvement and most of the nations surveyed have already got a countrywide virtual technology policy in region. Maximum international locations have embraced coverage development, but there may be a extremely good stratification in terms of their ability to implement. a country like South Africa, with its present infrastructure and extra mature economic system, is apt in phrases of potential to implement its virtual technology in education schedule. In terms of digital content material development, the want for virtual learning materials relevant to nearby curriculum has end up greater urgent as virtual era will become integrated into the teaching method across the curriculum (Farrell 2007). In developing countries, the education system is adopting development of ICT infrastructure in school systems through implementation of Digital Technology policies. In these countries, the civil society, NGOs and donor agencies, have

continued to play a major role in providing digital literacy equipment and resources to schools. Studies indicate that their efforts have been frustrated by the lack of connectivity, inconsistent electrical supply, and lack of technical support services—particularly in rural areas, (Farrell, 2007). Farrell (2007), states that the ICT policies emphasis on providing ICT infrastructure to secondary schools and, eventually, to primary schools as well. But implementing these policies and plans will require time and major provision of resources.

In Kenya the focus of digital technology in education over the last 10 years has mainly been on e-government and ICT skills development with investments made mainly at the secondary school and university levels. According to sessional paper no.14 of (2012), Efforts to introduce digital technology in Kenya has met with various impediments including access, funding, inadequate ICT resources, high cost of development of interactive digital learning content and inadequate capacity of ICT competent teachers.

In implementation of the DLP, the Kenyan public primary schools' teachers should be prepared in terms of infrastructure, teachers' competencies, teacher's perception of digital literacy program and digital content availability. According to KESSP (2005) poor physical facilities in school is one of the predominant obstacles to primary education in Kenya. For learners to access quality education and be retained in school there is need to have a congenial and friendly environment where the infrastructure (classrooms, computers, computer labs and the computers having the relevant software installed) conditions and learning mode is well set and appropriate for the learner (MOE,2001).

Teachers who are interested in using technology in their teaching often feel that they need better support than currently available. Such support includes both technical and social facets,

(Smerdon, 2000 as cited by Banju (2014). The teachers are also required to be well equipped with ICT skill and this can be achieved through training. Technology has tremendous capacity to enhance curriculum and teaching methods. Furthermore teachers might not be equipped to integrate technology and may not have good enough know-how and talents to utilize technology to guide the curriculum. Instructors can combine digital technology to complement and aid the curriculum, facilitate teachers' work, and inspire pupil-focused learning (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). In Kuwait, for instance, the national Council for Accreditation of teacher education (NCATE) emphasised that instructors need to take gain of technology for training and be organized to use technology efficiently within the lecture room (Afshari, Ghavifekr, Siraj, & Jing, 2013).

To make certain this, teachers should be furnished with a stable basis of knowledge and competencies in virtual media and broaden new understandings, new techniques, new roles, new varieties of professional improvement, and new attitudes approximately technology integration (Ruggiero & Mong, 2015; Sabzian & Gilakjani, 2013). As a result, instructors want to make a paradigm shift in their conception of curriculum and circulate from revealed traditional curriculum to virtual curriculum. They want to accumulate all the technical and pedagogical abilities that enable them to integrate virtual technology successfully and correctly into the faculty curriculum.

Acklers & Hardman (2001) asserts that teachers need perceive positively towards a new idea to create a new mode of teaching. It is reported that children at Gaonshahar village in India did not enjoy school at all because the teachers were not friendly until World Vision and UNICEF introduced child friendly schools approach in 2008 (Shrestha, 2010). Delft (2004 cited by Kanamba, 2014) says that after training, the attitude of the teachers and experimental groups

involved improved significantly. It can be noted that teachers' pedagogical beliefs and their teaching practices are also factors that seem to influence their uses of technology, (Becker, 2000).

Considerable resources have been invested in the education sector with the aim of educational reforms. The MDG report (2008) indicates that, the Kenyan government undertook the initiative of equipping public primary and secondary schools with ICT resources with the aim of improving academic performances and digital literacy levels among students. Their readiness to meet the new demands for implementing the DLP will determine the success of this process. But a report by Gakuu, Kidombo, Bowa, Ndiritu, Mwangi and Gikonyo (2011) paints a gleam picture that the Kenyan government seems to be lagging at the back of due to the fact, while computer studies has been added in secondary schools as a part of the country wide curriculum, it has not been able to offer sufficient vital infrastructure that is possibly to worsen in primary schools. ICT integration to education Challenges as cited in Sessional Paper NO. 14 of 2012 are said to be addressed through the development, securing resources and implementing a 5-year comprehensive National ICT in Education and Training Strategic Plan which include deployment and distribution of ICT infrastructure, professional development of ICT competencies for teachers and teachers' capacity building and facilitation of the development of digital literacy content aligned to the curriculum.

According to Sub report of Imenti North Sub- County (2015), the education Office indicates that majority of public primary schools in Imenti North Sub County have been installed with electricity, some of the teachers have been inducted on DLP usage and the schools have received the DLP devices with the content for class one and two and a DLP guideline for teachers. In some of the schools, teachers have adopted the use of DLP in their teaching and

learning while in most of other schools, teachers have not fully adopted use of digital literacy program in teaching and learning.

1.2 Statement of the Problem

Education sector in Kenya is undergoing major transformation due to amongst others, curriculum change which is changing to a Competence Based Curriculum and Technological innovations. In line with Vision 2030 under the initiative of Digital Literacy Program is the Implementation of e-learning in primary schools. Despite the roles Digital Technology can play in education, primary schools in Kenya are yet to adopt any form of Digital Technology for teaching and learning. Efforts geared towards implementation of DLP into the primary school system have not had much impact and it is still at the very basic stage and hanging at the policy level.

According to Sub County report (2015) it was clear that most of public primary schools' room in Imenti North Sub-County has electricity, these schools have received the Digital literacy devices with the content for class one and two while teachers are expected to create content for other classes to use in teaching, teachers have had induction forums for the implementation of DLP and yet in these schools, teachers have not fully adopted the implementation of Digital Literacy Program. A lot of efforts have been put to ensure successful implementation of the digital literacy program in Imenti North Sub County. However there has been complains from the sub county director of education and the headteachers in their meetings that the implementation of DLP is not being fully adopted by the teachers, most of the teachers in most of schools have not implemented the DLP in their schools.

Studies done by Wafula (2014) dealt with public primary schools' preparedness in implementation of Laptop project. Could it be that the implementation of DLP is affected by teachers' preparedness? It is against this gap that this study sought to fill by assessing the public primary school teachers' preparedness in the implementation of Digital Literacy Program in Imenti North Sub-county Meru Kenya.

1.3 Purpose of the study

The purpose of this study was to investigate the preparedness of public primary school teachers in the implementation of digital literacy programme in Imenti North Sub County Kenya.

1.4 Objectives of the Study

The study was guided by the following objectives:

i. To establish digital literacy infrastructural availability for the public primary school teachers' usage in teaching and learning in the implementation of digital literacy programme in public primary schools in Imenti North Sub County.
ii. To examine public primary school teachers' competence in implementation of digital literacy program in public primary schools in Imenti North Sub County.
iii. To determine public primary school teacher perception in the implementation of digital literacy program in public primary schools in Imenti North Sub County.
iv. To establish digital literacy content availability for the public primary school teachers in the implementation of digital literacy programme in public primary schools in Imenti North Sub County.

1.5 Research Questions

The study was guided by the following research questions:

i. To what extent are the public primary school teachers prepared in terms of infrastructure for the implementation of the digital literacy programme in Imenti North Sub-County?
ii. What are the public primary school teachers' competencies for the implementation of digital literacy programme in public primary schools in Imenti North Sub County?
iii. What are public primary school teachers' perception on the implementation of digital literacy programme in public primary schools in Imenti North Sub County?
iv. To what extent is the digital content available for public primary school teachers for the implementation of digital literacy programme in public primary schools in Imenti North Sub County?

1.6 Significance of the study

The government strategic plan intends to integrate digital literacy in teaching and learning through the introduction of laptops computers in primary schools as cited in the Kenya Vision 2030 and the Medium-Term Plan II of 2013-2017. As such, the findings of the study may assist the government to gauge the preparedness of the public primary school teachers on the implementation of DLP in teaching and learning in Imenti North Sub-county.

This study may yield an empirical data and information on readiness of the public primary school teachers in terms of infrastructure, competence, perception and digital content usage in teaching and learning in Imenti North Sub-county. The study aims at assessing the level of public primary school teachers' preparedness in implementation of DLP in public primary school. This may enable the researcher to be able to recommend best practices for adoption by the policy makers in the Ministry of Education together with other partners who are involved in the planning and curriculum development. It may also provide insight on the type of infrastructure, skills, attitude as well as ways of digital content improvement.

The study aims to uncover challenges that may hinder successful implementation of DLP in public primary schools by the public primary teachers in general and provide recommendations on mitigation measures. Furthermore, the study provides an opportunity to the teachers to air feedback on areas they feel greater attention is needed in improvement of digital content delivery and implementation. Finally, this study adds to the existing corpus of literature on teacher preparedness in implementation of digital technology in studies in general.

1.7 Limitations of the study

The limitations of the study are the fact that DLP implementation data was collected through self-assessment questionnaire for teachers and the interview guide for the MOE officers. Some teachers and education officials from MOE, may decline to give information concerning their perception of the Digital Literacy Program due to the fear of victimization. Time was also a limiting factor, schools had their own tight schedules. Other respondents were biased and gave responses that likely favoured the researcher's results or the situation on the ground hence undermining the intent of the study. In this instance, the researcher enlightened the respondents on the need to provide correct data that would be usable in accurately depicting the true scenario.

1.8 Delimitation of the study

The study was carried out in all the public primary schools in Imenti North County, of Meru County. According to Imenti North Sub County Education Office, the Sub County has 59 public primary schools. The study respondents were a sample of the public primary school TSC teachers, including the head teachers and their deputies. According 1to Imenti North Sub County Education Office, there are 596 TSC teachers, both the teachers and head teachers. This was because the government identified public primary schools as the avenue for introduction

of digital literacy through the roll out of laptop flagship project. In addition, the study assessed public primary school teachers' preparedness in the implementation of the digital literacy program in Imenti North County. As a result, the study researched four variables that includes; infrastructural preparedness, teacher's competence, teacher perception and digital literacy content availability in the implementation of digital literacy program in public primary schools in Imenti North Sub County.

1.9 Assumptions of the study

This study assumes that the target population (public primary school teachers) participated willingly in the study. Also, the study assumed that the questionnaires given to the respondents were highly returned. The study also assumed that the schools in Imenti North Sub-county are implementing the digital literacy program.

1.10 Definition of significant terms

Competency: the functionality to use or use a set of associated expertise, competencies, and skills required to efficaciously carry out "crucial work functions" or responsibilities in a defined work placing.

Curriculum: Refers to the subjects comprising a course of study in a school or college.

Digital content Availability: Refers to the provision of academic material that pupils use to learn

Digital Learning: Refers to the learning facilitated by technology

Digital Literacy Programme: Refers to government initiative introduced in public primary schools to ensure pupils in Kenya have ability to use digital technology and communication tools in learning.

Implementation: Effectively carrying out digital literacy programme in public primary schools.

Information and communication technology: An umbrella term referring to a wide range of software technology component such as computer, telecommunication, internet, video and digital cameras that can be used by teachers to support their work.

Information Technology: Refers to the science of managing and processing information using computers.

Infrastructure: The basic physical and organizational structures and facilities (e.g. buildings, roads, and power supplies) needed for the operation of a society or enterprise.

Preparedness: The setting up of infrastructural and human resource facilities towards implementation of digital Literacy program in public primary schools.

School: An organization designed to offer learning areas and learning environments for the teaching of students under the direction of teachers.

Teacher: A person who helps others to acquire knowledge, competences or values in a schooling setup.

1.11 Organization of the study

This study is organized into five chapters. The first chapter is introduction covering the background to the study, statement of the problem, purpose of the study, research objectives, research questions, significance of the study, assumptions of the study, limitations of the study, delimitation of the study and definition of key terms. The second chapter is literature review on

the variables related to public primary school teachers' preparedness and digital curriculum implementation in general. It also elucidated the theoretical framework of the study, delving into preparedness in terms of infrastructure, teachers' competence, perception of teachers as well as availability of digital literacy content. At the end of this chapter is the conceptual framework. Chapter three presented the research methodology covering of the introduction, research design, target population, location of the study, sample size and Sampling procedure, research instrument, validity of the research instrument, reliability of the research instrument, method of data collection, data analysis, operational definition of variables, ethical considerations and summary. Chapter Four covers data presentation, interpretation and discussion, while Chapter Five covers summary of the study, conclusions, recommendations and suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on public primary school teachers' preparedness in the implementation of digital literacy program in public primary schools in Imenti North Sub County. Specifically, it provides a review on the extent of public primary schools' teachers' preparedness in terms of infrastructure availability, teacher competence, teachers' perception and digital content availability on implementation of digital literacy program in public primary schools in Imenti North Sub County. Theories relevant to the topic of study of digital literacy program and conceptual framework was also presented.

2.2 Overview on Digital Literacy Program in Public Primary Schools in Kenya

Digital technology is changing the way we live, communicate and learn. It can be harnessed to expand access to education, including learners in places with limited infrastructure through, for example, tablets. Digital Technology can also be used to address systemic challenges by providing on-going professional training to teachers and supporting education together with infrastructural improvement. UNESCO (2017). However, Rust (2014) argues that access to technologies does not only imply having access to infrastructure and hardware, but also having the right skills to exploit the benefits and avoid the pitfalls of this new way of living Devaux, Bélanger, Grand-Clement & Manville (2017). As observed in the International Journal For e-Learning Security (2011) with Digital Literacy integration in curriculum, in some countries example Norway, the mode of integration leads to some consequences as discovered by Ogrim and Beck (2009), which includes tendency towards less focus on ICT in teaching and learning among others. Erstad (2007) argues that in order to safe guard graded basic skills in digital

literacy, it must be guided by available time, technological infrastructure and the expertise (competent ICT teachers and implementers).

The Digital Literacy Program is a program borne out of the government of Kenya vision 2030 to ensure every pupil is prepared for today's digital world and to transform learning in Kenya into a 21st century education system, Digischool (July 2016). The program also enables teachers to use digital technologies to create and deliver learning content. The government rolled-out a Digital Literacy program in public primary schools in 2014 through the Lap top project. In reference to a report given in a meeting of Kenya primary School Heads held on 6th December 2017, over 89.2% of all the public primary schools have been supplied with the DLP devices.

There is research evidence that use of technology in education for solving problems, conceptual development and critical thinking is a powerful tool (Katitia, 2012). This is because, in schools where technology was integrated in learner-centered pedagogy, the learners performed much better than similar groups taught using teacher-led methods which were teacher-centred in the achievement test (Karsenti, 2009).

As with every technology initiatives, whether or not in enterprise or training, the intention isn't always simply to set up the technology, but to harness its strength to alternate or improve the surroundings in which it is launched. enforcing technology for technology's sake is certain to fail (Chambers, 2014). If the digital literacy software is carried out with fidelity this would in turn cause the faultless use of digital sources in the course of the college day, and there can be many advantages to our network, education establishments, and stakeholders.

2.3 Availability of Infrastructure and Implementation of Digital Literacy Program

Technology facilitates how students receive content. The technology and infrastructure considerations necessary in the DLP are: teacher digital device, learners' digital device,

projector, DLP content servers (DCS), digital wireless router, power supply for grid or solar power, device storage and charging and special needs devices. Other considerations are desks and classrooms that learners will use during learning which are learner friendly. In a study research by Wagner, Kegan, Lahey, Lemons, Garnier, Helsing, & Rasmussen (2012), it was found to imperative that every school create the right conditions (time, space and resources) for every program or new initiative to be successful. According to KESSP (2005) poor primary school infrastructure is one of the major barriers to improving access to primary education in Kenya.

Most countries in Africa do not have a good infrastructure in terms of their transportation, minimal electricity connections in schools among others. This has made it difficult for schools to successfully equip and integrate digital resources into teaching and learning. For schools to encourage a positive attitude towards integration of digital resources, then there is need to adequately invest in providing and increasing availability of these resources (Kessy, et al, 2006; Ford, 2007).

Critics of the infrastructure in ICT integration in education furthermore argue that, the acquisition of ICT tools such as computer hardware and software, the setting up of the communication infrastructure and their maintenance has been said to be costly in majority of schools in developing countries (Kenya being one of the countries), inhibiting their adoption in the classroom and becomes increasingly difficult for schools to effectively introduce technology into classroom teaching and learning (Kessy, et al, 2006; Ford, 2007).

2.4 Teacher Competency and Implementation of Digital Literacy Program

Educators are essential to ensure pupils learn and stay on track. To build and enhance the competence of teachers to deliver digital learning to pupils, training module for teachers in public primary schools should be put in place. According to Cuban (2001), many teachers do not understand how to incorporate technology into their teaching. It is therefore important that they be provided with enough time to learn and experiment with the new technology outside the scheduled class time by participating in seminars, conferences and workshops, this calls for support from the school administration who should also encourage the teachers to use technology in the classroom by availing the required resources (Bingimlas, 2009).

A deficiency in professional improvement in what and a way to adapt to the adjustments due to this system can negatively impact the effective integration of technology (Inan & Lowther, 2010). According to Sandholtz & Reilly (2004) learning designers and teachers should be supported in their quest to match learning tasks to learning technology, thereby improving their understanding as well as their effective use of technology. For teachers to take up the challenge of incorporating ICT in their classroom teaching it is therefore important to provide them with the technical and pedagogical skills to achieve effective integration. Critics of teacher competence observes that professional improvement is indispensable within the achievement of accurate integration of technology and pedagogy (Garthwait & Weller, 2005; Grimes & Warschauer, 2008; Inan & Lowther, 2010).

In Kenya, Curriculum Guide for ICT Integration in Education states how the TSC is committed to providing professional development to teachers in the teaching service. Therefore, a technical team was constituted to develop a harmonized ICT curriculum in preparation for the digital

literacy program implementation. Still studies show that little is done in the Kenyan public primary school teachers in the implementation of the DLP in teachings and leaning

2.5 Teacher Perception and Implementation of Digital Literacy Program

Teachers perception in this context is the way in which teachers understands or interprets activities involved in implementation of digital literacy programs. An easily overlooked aspect that teachers may struggle with deals with their perception about the usage of the technology in their classrooms. Teachers needs to have positive attitude towards a new idea to create a new mode of teaching (Montagnes, 2001). This is because, the perception of teachers has proven to have an impact on the integration of technology in the classroom (Inan & Lowther, 2010). Therefore, primary school teacher capacity building is a key to successful implementation of DLP since it will play a role of boosting the perception of digital literacy program implementation.

According to Uslu and Bumen (2012), studies conducted in Israel (Klieger, Benttor & Bar-yossef, 2010) and Australia (Pierce & Ball, 2009), go on to show that the attitudes of the educators are crucial in determining whether the implementation of technology in education succeeds or fails. Critics of teacher perception in digital technology, furthermore, observes that teachers with a positive attitude towards technology and regularly use it, will be at ease while using technology and the chances are high that they will plan to incorporate it in their day to day classroom activities (Kidombo, 2010). Studies indicate that educators who still hold the belief that pupils can only learn better when exposed to the traditional ‘chalk and talk’ method do not see the need of pupils venturing and experimenting with computer-based technologies for learning (Chai & Lim, 2008).

2.6 Digital Content Availability and Implementation of Digital Literacy Program

Digital content is the academic material that pupils use to learn. Availability of digital content in schools has contributed significantly to increase teachers' willingness to incorporate digital learning in classroom teaching (Tondeur, Hermans, van Braak & Valcke, 2008). UNICEF (2010) asserts that without instructional resources, no learning can take place. Pupils' access to instructional materials is an important factor in what and how much they learn (UNESCO, 2005). Digital content comes in many forms including text, audio and videos files, graphics, animations, and images. The Digital Learning Program provides a framework for identification of approved educational content materials to be digitized and availed in a secure digital platform for learners. In reference to KICD Draft Report Series 121 of (2013), the Kenya Institute of Curriculum Development (KICD) has developed and executed a framework for developing content and converting it into digital platform. The DLP devices are preloaded with content which includes interactive digital content for classes 1 and 2.

A growing percentage of data is held within the cloud, a growing range of public services had been digitized, and technology is becoming basically incorporated into instructional curricula. certainly, because the internet will become ever greater essential to the entire amusement of human rights, being disconnected poses ever extra limitations. The ICT quarter plays an vital position in facilitating children's get right of entry to to the net and improving their digital literacy. commercial enterprise may be a effective force for connectivity, using its reach and sources to break down the virtual divide and offer the advantages of technology to all. From mobile beginning registration to digital entrepreneurship training, networked companies can locate infinite opportunities to aid children's rights on line (Chai & Lim, 2008).

Availability of the virtual content material net is hindered by means of a number of obstacles that dissuade, constrain or impede children's significant participation inside the virtual world. While there is a remarkable lack of strong research on whether or not and how children get admission to digital content material, specifically inside the developing global, children are in all likelihood to stand a mixture of limitations to accessing the virtual content material. these limitations include affordability obstacles that end result from high prices of generation and net get right of entry to and might deter disadvantaged households from making an investment in ICTs at domestic and additionally connectivity which restraints stem from insufficient communications and electrical infrastructure, and often differentially have an effect on rural groups. furthermore, Literacy boundaries, which include decrease ranges of studying capacity and technical skill, make it tough to fully interact with ICTs in a meaningful manner and Inclusivity demanding situations rise up from ICT design and consumer interface, which may make generation tough to get entry to by way of virtue of language, ability or incapacity (Pierce & Ball, 2009).

2.7 Summary of Literature Review

The literature review revealed that preparedness of public primary school teachers in the implementation of digital literacy in teaching and learning. Different studies support that implementation of digital literacy requires the available technological infrastructure, skilled teachers and an overall positive attitude towards necessary changes in teaching and learning practices in response to the introduced technology Fyksen (2011).

For instance, Wafula (2014) studied preparedness of public primary schools in the implementation of laptops project in Kenya; a case of Kimilili Sub County, Bungoma County. The study found out that infrastructure was a contextual factor affecting adoption of laptop

project in schools. However, his study leaves a need to assess the preparedness of public primary school teachers in implementation of DLP. Banju, (2014) studied factors influencing implementation of the laptop project in public primary schools in Kenya: a case of Nairobi County. The study concentrated on procurement procedures, financing issues, teachers' capacity and power supply but deviated from this current study being proposed.

On teachers' capacity, the study recommended that the Teachers service commission (TSC), should plan to retrain all public primary school teachers on the use of ICT in the classrooms so as to support teachers implement the same swiftly. There was no specific focus on digital literacy since the study concentrated on procurement procedures. Ndung'u, Maweu & Mwenja (2017) conducted research on an e-readiness assessment of ICT integration in public primary schools in Kenya case of Nyeri County. The study evaluated institutional infrastructure, level of preparedness of teachers and other factors that would hamper effective ICT integration in public primary schools. It was also revealed that teacher's attitude towards ICT was very positive. The study had no specific focus on digital literacy or teacher preparedness.

Moreover, Wanyoike (2016) studied the preparedness of teachers in integrating information communication technology in public primary schools in Thika West district, Kiambu County, Kenya. The study found out that many of the public primary schools in Thika West district were connected to the national electricity power grid but nearly three quarters did not have internet connectivity. None of the schools has computers devoted for teaching and learning. Not much is documented about digital literacy program implementation and preparedness of primary school teachers in Kenya. It is in this context the researcher wishes to assess the extent to which public primary school teachers are prepared for DLP implementation in terms of infrastructure, teachers' competency, teachers' perception and availability of digital literacy content.

2.8 Theoretical framework

This study was guided by technology diffusion theory by Everett Rogers (1995) (cited by Jayati Sarkar 1998 and Toshihiko Mukoyama 2003). The theory defines technology diffusion as a mechanism that spreads successful varieties of product and process through an economic structure and displaces the existing inferior varieties either wholly or partly. The theory further defines diffusion as the process by which an innovation is adopted and gains acceptance by the members of the society.

The theory states that new technologies are the engines of economic development. Studies in this theory indicate that many researchers have discovered technological development to be critical in growth procedure. In Kenya earnings differences recommend that a huge a part of income variation is defined by way of the differences in technology employed in the country. Rogers discovered that It takes time for a brand new technology to accumulate monetary significance. He argues that first, it needs to be brought into the economy (innovation). Then, it's far steadily followed by using many people (diffusion). For the last 10 years in Kenya for example, there are strategic plans for the development within the economics of innovation.

Despite the fact that, not a whole lot interest appears to be paid to the economics of diffusion. Diffusion is as weighty as innovation: there's no new technology with an economic effect until they grow to be substantial within the economy. Diffusion isn't always an ordinary system: usually, diffusion takes an extended time period. Moreover, in lots of instances, innovation and diffusion are correlative. A mutual function of newly invented machines is that at the beginning, they are difficult to address.. This feature leads to a well-known empirical fact: high levels of skilly are demanded in the early stage of technology diffusion. Nelson, Peck, and Kalachek (1967).

The technology diffusion theory is significant in that it outlines how an innovation is introduced and adopted in the market and hence the process of acceptance of the innovation in the market (diffusion). This explains Digital Literacy program (innovations) in the primary schools and the process of implementation by the teachers and other implementers (diffusion). The theory is related to this study in that, innovations in this case the DLP devices and the related infrastructure though put in place cannot succeed alone without diffusion which involves the teachers' capacity building through training and enhancing their skills and the development of the digital content for the successful implementation.

2.9 Conceptual Framework

Conceptual framework as defined by Miles &Huberman (1994), is a written or visual presentation that explains either graphically or in narrative form the main themes to be studied, for instance, the key factors, concepts variables; are pre-assumed relationship among them.

The conceptual framework of the study is presented in figure1

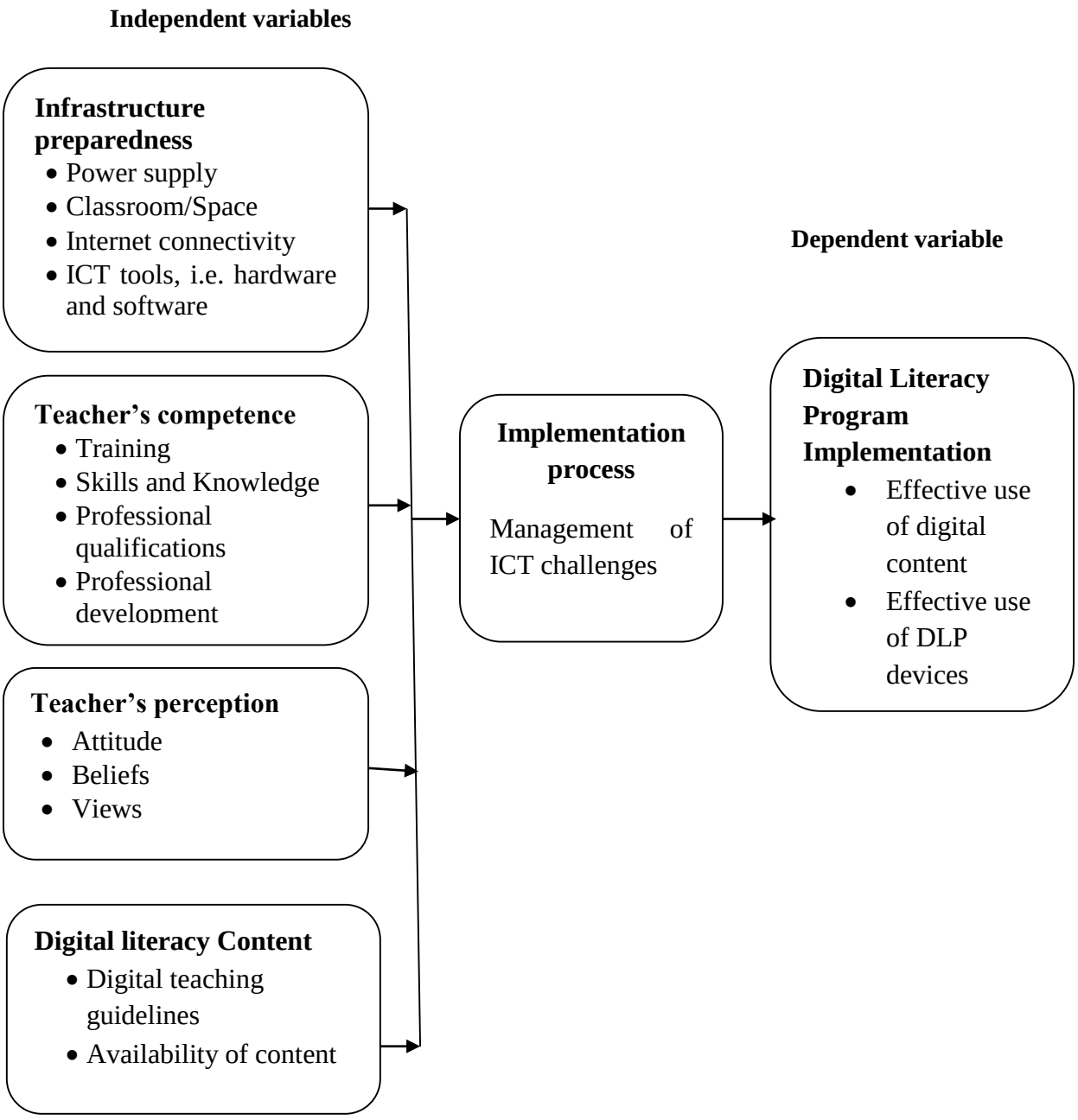

Figure 1: Conceptual Framework on Interrelationship among Variables

The conceptual framework advances that the Digital Literacy Program implementation is the dependent variable which is affected by the independent variables (public primary school's teacher's preparedness in terms of infrastructure, teacher competence, teachers' perception and digital literacy content availability.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focused on the research design, location of the study, target population, sampling frame, sample and sampling technique, methods of data collection, validity and reliability of data collection instruments, methods of data analysis as well as pilot study, operational definition of variables, and ethical and logistical considerations.

3.2 Research design

The study adopted a descriptive survey research design because according to Ahiadeke (2008) survey research is a data collection method which requires asking people, referred to as respondents for information using either verbal or written questions. According to Neuman (2007) survey uses instruments such as questionnaires and interviews to gather information from groups of subjects and permits the researcher to summarize the characteristics of different groups or to measure their attitudes and opinions toward some issue. Similarly, Fisher (2010) noted that when researchers try to obtain a broad and representative overview of a situation, then the survey approach would be appropriate. This study focused on assessing the public primary school teachers' preparedness in digital literacy in Imenti North Sub County. The design was based on qualitative as well as quantitative information where data interpretation was followed by explanation on responses.

3.3 Target population

Target population is defined by Kumekpor (2002) as the entire group of people the researcher desires to learn about, also according to Mugenda & Mugenda (2003), target population refers to the population which a researcher want to generalise results for a study. This study's target

population was 596 public primary school teachers in the Sub County inclusive of head teachers and deputy head teachers. There were 59 Head Teachers and 537 teachers giving a total of 596.

3.4 Sample Size and Sampling Procedure

According to Mugenda and Mugenda (2003), a sample size of 10-30% is statistically significant for a considerably small population size. Orodho (2010) defines a sample as a small part of a large population which is thought to be a representative of the larger population. To sample the respondents in the Sub County, 50% of the head teachers were selected making a total of 30 head teachers.50 percent was used to enable a good representation because the bigger the sample is, the more representative the population becomes. The 20% of the total number of teachers were employed to get the sample size of 107 participating teachers. Stratified sampling was used to select two categories of schools which was the schools in Miiriga Mieru West division and Miiriga Mieru East division where the teachers' sample size came from. Proportion allocation of 50% in each category of schools were used to form a sample of 30 schools for the study. Proportion allocation of teachers using 20% per the school category was used to select teachers from each division and this is because the schools in these two divisions are not equally staffed with teachers. Simple random sampling was used to select 30 public primary schools from the 59 public primary schools in Imenti North Sub-County and to select teachers in the selected schools to participate in the study, this gave the entire individual in the defined population an equal and independent chance of being selected as members of the sample.

Table 3.1 Category of Respondents and their Numbers

Category	Target population	Sample size
Head -teachers	59	30
Teachers	537	107
Total	**596**	**137**

3.5 Research Instruments

The research instruments used in this study for data collection was an observation schedule for the digital resources and teaching, questionnaires for teachers and head teachers and unstructured interview guide for the MoE officers. The unstructured interview was administered face-to-face or over the phone with the MoE officers in the sub- county. This ensured clarity of issues and enable avoidance of misinterpretation of issues. Data for the study was collected using structured questionnaire which is a data collection tool in which written questions are presented to be answered by the respondents in written form. Creswell (2009) states that, structured questionnaire is preferred since it increases the degree of responses and are easily coded and analysed. Mugenda & Mugenda, (2003). There was one set of questionnaires for Headteachers and teachers. (Appendix B).

3.6 Validity of the Instruments

Mugenda and Mugenda (2003) defines validity as the accuracy and meaningful of inferences. Which are based on the research results. Gakuu (2013), posit that validity refers to the appropriateness, meaningfulness and usefulness of inferences made by researchers. The supervisors who are experts in the area of study validated the instruments. A piloting test was conducted to test the quality of the questionnaire as well as respondents understanding of the

research tool. To avoid contamination of results, a pilot study was done in Buuri Sub County. Two schools were selected through simple random sampling procedure. A Head Teacher and two teachers from each school participated in the pilot of the research instruments. The researcher implemented the suggestions given by the supervisor.

3.7 Reliability of the Instruments

Ngechu (2004), states that reliability is the ability of research instrument to yield consistent results or data after repeated trials. To enhance the reliability of the instrument a pre-test was conducted in other schools in Buuri sub-county which was not included in the main study. The technique for extracting an estimate of reliability was acquired from the administration of test-retest reliability technique which concerned administering the identical instrument two times to the equal group of subjects with a weeks' time lapse among the primary and 2nd test. A Pearson's product moment correlation coefficient formula was used.

$$r = \frac{N\Sigma XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$$

Where: -

$\sum X$ = the sum of scores in x distribution

$\sum Y$ = the sum of scores in y distribution

=symbol of summation

$\sum X2$ = the sum of squared scores in x distribution

$\sum Y2$ = the sum of squared scores in y distribution

$\sum XY$ = the sum of products of paired x and y scores

N = the total number of subjects.

According to Mugenda and Mugenda (2003) a coefficient of 0.70 or more showed that there is high reliability of data and hence was deemed appropriate.

3.7.1 Reliability Analysis

Reliability of the questionnaire was evaluated via Cronbach's Alpha which measures the inner consistency of ratings. The Alpha measures inner consistency with the aid of setting up if sure items degree the equal construct. Gliem (2003) mounted the Alpha value threshold at zero.7 which the study forty five benchmarked towards. Cronbach Alpha become established for each objective with a purpose to decide if each scale (objective) could produce steady outcomes should the research be performed afterward. The results are in Table 4.2.

Table 3.1: Reliability Analysis

	Cronbach's Alpha
Availability of digital literacy infrastructure	0.873
Teachers competency	0.781
Teachers perception in implementation of digital literacy	0.935
Availability of digital literacy content	0.857

Table 4.2 shows that all the scales were significant, having an Alpha above the prescribed threshold of 0.7. Teachers' perception in implementation of digital literacy was the most reliable with an alpha value of 0.935, followed by Availability of digital literacy infrastructure which had an alpha value of 0.873, while Availability of digital literacy content which had an alpha value of 0. was the least reliable. This illustrates that everyone the four variables had been dependable as their reliability values passed the prescribed threshold of zero.7 (Bryman, 2015).

This, consequently, depicts that the research tool changed into dependable and consequently required no amendments.

3.8 Data Collection Procedures

The researcher obtained an introduction letter from the University of Nairobi to obtain a research permit from the National Commission for Science, Technology and Innovation. Afterwards, the permit was presented to the Sub County Education Officer, Imenti North Sub County so as to be allowed to conduct the study. The researcher personally administered the questionnaires comprising closed and open-ended questions to the sample respondents through the drop and pick method, a fact that helped to achieve a good response rate. Respondents to the questionnaires were briefed on the significance of the study. Explanations to questions which were not clear were done. The data collection took a period of three weeks.

3.9 Data Analysis Techniques

According to Kombo & Tromp (2006) data analysis is the interpretation of collected raw data into a useful information. After collection of data from the field, the researcher used both qualitative and quantitative analysis. Data was organized and classified according to the objectives. This means that completed questionnaires were sorted, collated and cleaned up in readiness for data inputting and its subsequent analysis. Statistical Package for Social Scientists (SPSS) was used to analyse questionnaires. Descriptive statistics such as frequencies, percentages, mean score and standard deviation were estimated for all the quantitative variables and information presented inform of tables. Also, inferential statistics were used like Anova and regression. The qualitative data from the open-ended questions was analyzed using conceptual content analysis and presented in prose

3.10 Ethical Considerations

Researchers whose subjects are people or animals must consider the conduct of their research and give attention to ethical issues associated with carrying out their research (Kombo and Tromp, 2006). In this regard, Formal procedures of obtaining permission to conduct a research study were carried out in all research fields, (Marrison, 2007). Privacy and confidentiality concerns were given the deserved consideration (Cohen & Manion, 1994). To this end all potential participants received an explanation concerning the nature and purpose of this study. The researcher also assured the respondents that their concerns of privacy and confidentiality was appropriately protected. The researcher obtained orally informed consent from the respondents after they carefully consider the risks and benefits and was given an opportunity to ask any pertinent questions about the study.

CHAPTER FOUR

DATA ANALYSIS PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents data analysis, presentation and interpretation. The purpose of this study was to investigate the preparedness of public primary school teachers in the implementation of digital literacy programme. The study was based on the following objectives, to establish digital literacy infrastructural availability for the public primary school teachers' usage in teaching and learning, examine public primary school teachers' competence, determine public primary school teacher perception and establish digital literacy content availability for the public primary school teachers in the implementation of digital literacy programme in public primary schools. The findings were presented in tables.

4.2 Response Rate

The respondents involved were the school head teachers and teachers in the selected public primary schools. They returned the questionnaires as tabulated in Table 4.1.

Table 4.2: Response Rate

Respondents	Sampled size	No. collected	Return rate (%)
Head teachers	30	19	63.3
Teachers	107	76	71.0
Total	**137**	**95**	**70.4**

Findings in table 4.1 indicates that the average questionnaire return rate was well above 70 percent which according to Gakuu (2013) is an acceptable proportion and can be termed adequate for analysis.

4.3 Demographic Information

The demographic data of the school head teachers and teachers focused on their gender, age, highest professional qualifications, designation and level of Computer Application Training. This study sought to establish whether demographic characteristics of the head teachers and teachers had an influence on data collected on preparedness of public primary school teachers in the implementation of digital literacy programme in Imenti North Sub County Kenya.

4.3.1 Gender of Respondents

In order to establish whether gender influenced data collected on preparedness of public primary school teachers in the implementation of digital literacy programme. The following analysis was done and findings are presented in Table 4.2.

Table 4.3: Gender of Respondents

	Head teachers		**Teachers**	
	Frequency	**Percent**	**Frequency**	**Percent**
Male	11	57.9	48	63.2
Female	8	42.1	28	36.8
Total	**19**	**100**	**76**	**100**

As illustrated in Table 4.2, the findings revealed that majority of the head teachers are male (57.9%) while the rest were female (42.1%). On the same the findings showed that male teachers were 63.2% while female teachers were 36.8%. This meets the threshold of the current Kenyan Constitution 2010 which stipulates that not more than two thirds (67.7%) of any public institution should be drawn from one gender. It also implies that regardless of the gender the respondents were able to give reliable information.

4.3.2 Age of the Respondent

The respondents were asked to indicate their age in years. Age has an effect on the Teachers attitude towards digital literacy content hence analysis for respondents age was necessary. Findings are presented in Table 43.

Table 4.4: Age of the Respondent

	Head teachers		Teachers	
	Frequency	**Percent**	**Frequency**	**Percent**
Below 25 years	0	0	6	7.9
31-35 years	3	15.8	30	39.5
36-40 years	8	42.1	25	32.9
41-45 years	5	26.3	12	15.8
46-50 years	3	15.8	3	3.9
Total	**19**	**100**	**76**	**100**

The findings in Table 4.3 reveal that most of head teachers were aged 36 to 40 years (42.1%) followed by 41 to 45 years (26.3%) then 46 to 50 years and 31 to 35 years (15.8%). Most of teachers were aged 36 to 40 years (39.9%) followed by 41 to 45 years (32.9%) then 31 to 35 years (7.9%) while those aged 46 to 50 years were the least at 3.9%. This shows that most of the respondents were youths hence most of them have an interest in digital literacy content. The information on the subject under study provided by these respondents could therefore be relied upon to investigate the preparedness of public primary school teachers in the implementation of digital literacy programme.

4.3.3 Highest Professional Qualifications

The head teachers' and teachers' highest professional qualifications were also sought to find whether they were qualified to manage and teach in public primary schools and whether they could provide reliable information concerning this study. Findings are presented in Table 4.4.

Table 4.5: Highest Professional Qualifications

	Head teachers		Teachers	
	Frequency	Percent	Frequency	Percent
Certificate	8	42.1	47	61.8
Diploma	5	26.3	14	18.4
Bachelors	4	21.1	12	15.8
Masters	2	10.5	3	3.9
Total	**19**	**100**	**76**	**100**

The results in Table 4.4 indicates the head teachers who had certificate were the majority at 42.1% followed by those who had diploma at 26.3% then bachelor's degree at 21.1% while those who had master's degree were the least at 10.5%. The teachers with certificate were the majority as shown by 61.8%. Other teachers had a diploma as shown by 18.4%, bachelors at 15.8 and master at 3.9%. This shows that the head teachers and teachers had attained the minimum qualification of a primary school teacher which is a certificate. Effective implementation of digital literacy programme requires qualified head teachers and teachers, this could assist them to successfully implement digital literacy programme.

4.3.4 Respondents Designation

The respondents were also asked ton indicate their designation. Their responses were as shown in Table 4.5.

Table 4. 6: Respondents Designation

	Frequency	Percent
Head Teacher	19	20.0
Assistant Teacher	48	50.5
Deputy Head Teacher	28	29.5
Total	**95**	**100**

From the study findings, the assistant teachers were 44.2%, deputy head teachers were 29.5% while assistant teachers were 50.5%. This implies that all the respondents were in relevant positions to be able to participate and give reliable information on the subject under study.

4.3.5 Level of Computer Application Training

The respondents were further asked to indicate their level of computer application training. Their responses were as shown in Table 4.6.

Table 4.7: Level of Computer Application Training

	Head teachers		Teachers	
	Frequency	Percent	Frequency	Percent
Certificate	14	73.7	62	81.6
Diploma	5	26.3	14	18.4
Total	**19**	**100**	**76**	**100**

From the findings, the head teachers indicated that their level of computer application training was certificate as shown by 73.7% and those whose level was diploma were only 26.3%. On the same, most of the teachers indicated that they had certificate in computer application training as shown by 81.6% while the rest had diploma at 18.4%. This indicates that most of teachers had basic computer application training and hence this was important on implementation of digital literacy programs. The information provided on implementation of digital literacy programme was also relevant and reliable.

4.4 Digital literacy Infrastructural availability

The first objective was to establish digital literacy infrastructural availability for the public primary school teachers' usage in teaching and learning in the implementation of digital literacy program in public primary schools in Imenti North Sub County. The respondents were asked to indicate the extent to which they agree with various statements on infrastructural preparedness. The findings were as shown in Table 4.7.

Table 4.8: Agreement with Various Statements on Infrastructural Preparedness

Head teachers	Mean	Std. Dev.
The school has a complete computer lab but not fully equipped	3.053	0.229
The school has electricity	2.684	0.582
The school has inadequate internet connections	2.632	0.684
There are enough digital literacy program devices for teaching and learning in the school	1.684	0.749
There are enough tablets for the learners	1.421	0.507

Teachers	Mean	Std. Dev.
The school has a complete computer lab	3.053	0.225
The school has electricity	1.790	0.838
The computer lab has internet connections	2.000	1.265
There are enough laptops for the teachers	3.303	0.766
There are enough tablets for the learners	3.421	0.497

From the findings, the head teachers agreed that the school has a complete computer lab but not fully equipped as shown by a mean of 3.053, that the school has electricity as shown by a mean of 2.684 and that the school has inadequate internet connections as expressed by a mean of 2.632. The respondents also disagreed that there are enough digital literacy program devices for teaching and learning in the school as shown by a mean of 1.684 and strongly disagreed that there are enough tablets for the learners as indicated by a mean of 1.421. These findings concur with Kessy, *et al*, (2006) who found that most countries in Africa do not have a good infrastructure in terms of their transportation, minimal electricity connections in schools among others. This has made it difficult for schools to successfully equip and integrate digital resources into teaching and learning.

On the same, the teachers agreed that the school has electricity as shown by a mean of 3.190. Teachers further disagreed that there are enough tablets for the learners as expressed by a mean of 2.342, that there are enough laptops for the teachers as indicated by a mean of 1.834 and that the school has a complete computer lab as illustrated by a mean of 1.761 but strongly disagreed

that the computer lab has internet connections as indicated by a mean of 1.216. This is in line with the Ford (2007) who noted that acquisition of ICT tools such as computer hardware and software, the setting up of the communication infrastructure and their maintenance has been said to be costly in majority of schools in developing countries (Kenya being one of the countries), inhibiting their adoption in the classroom and becomes increasingly difficult for schools to effectively introduce technology into classroom teaching and learning.

4.5 Teacher competence in implementation of Digital Literacy.

The second objective was to examine public primary school teachers' competence in implementation of digital literacy program in public primary schools in Imenti North Sub County. The respondents were requested to indicate the extent to which they agree or disagree with various statements on public primary school teachers' competence. Their replies were as shown in Table 4.8.

Table 4.9: Agreement with Statements on Public Primary School Teachers' Competence

Teachers	Mean	Std. Dev.
Teachers in this school are trained on digital literacy	1.474	0.697
Teachers in this school have basic computer skills and knowledge	1.895	0.809
There are Digital Literacy Program workshops every school holiday	2.842	0.749
I have basic computer skills and knowledge	2.790	0.957
I am trained on digital literacy	2.790	0.618
I am skilled enough to handle a digital literacy class	1.790	0.838
Teachers have inadequate skills and knowledge in ICT integration in teaching and learning.	2.211	1.111

The head teachers disagreed that teachers in their school have basic computer skills and knowledge as expressed by a mean of 1.895 and strongly disagreed that teachers in their school are trained on digital literacy as shown by a mean score of 1.474. These findings agree with Cuban (2001) who notes that many teachers do not understand how to incorporate technology into their teaching. It is therefore important that they be provided with enough time to learn and

experiment with the new technology outside the scheduled class time by participating in seminars, conferences and workshops, this calls for support from the school administration who should also encourage the teachers to use technology in the classroom by availing the required resources.

On the same teachers agreed that there are Digital Literacy Program workshops every school holiday as shown by a mean of 2.842, that they have basic computer skills and knowledge as shown by a mean of 2.790 and that they are trained on digital literacy as indicated by a mean of 2.790. The teachers further disagreed that teachers have inadequate skills and knowledge in ICT integration in teaching and learning as expressed by a mean of 2.211 and that they are skilled enough to handle a digital literacy class as indicated by a mean of 1.790. These findings correlate with Sandholtz and Reilly (2004) who argued that learning designers and teachers should be supported in their quest to match learning tasks to learning technology, thereby improving their understanding as well as their effective use of technology. For teachers to take up the challenge of incorporating ICT in their classroom teaching it is therefore important to provide them with the technical and pedagogical skills to achieve effective integration.

4.6 Teacher Perception on implementation of Digital Literacy

The third objective was to determine public primary school teacher perception in the implementation of digital literacy program in public primary schools in Imenti North Sub County. The respondents were requested to indicate the extent to which they agree or disagree with various statements on public primary school teacher perception. The findings were as illustrated in Table 4.9.

Table 4.10: Agreement with Statements on Public Primary School Teachers' Perception

Head teachers	Mean	Std. Dev.
I encourage my teachers on the importance of digital literacy program	2.579	1.017
I take teachers for induction programmes on digital literacy	1.526	0.697
I allow teachers to discuss with me the challenges they may be facing in the implementation of digital literacy program	3.158	0.602
I encourage inter personal skills through team teaching with the teachers of this school	3.211	0.419
I have embraced digital literacy	2.118	0.588
Teachers believe digital literacy program implementation Will be successful	2.540	0.855
Teachers have positive attitude towards digital literacy program implementation	2.573	0.701

The head teachers, agreed that they encourage inter personal skills through team teaching with the teachers of this school as shown by a mean of 3.211, that they allow teachers to discuss with me the challenges they may be facing in the implementation of digital literacy program as shown by a mean of 3.158 and that they encourage my teachers on the importance of digital literacy program as indicated by a mean of 2.579 but disagreed that they take teachers for induction programmes on digital literacy as expressed by a mean of 1.526. This is in line with Kidombo (2010) who observes that teachers with a positive attitude towards technology and regularly use it, will be at ease while using technology and the chances are high that they will plan to incorporate it in their day to day classroom activities

On the same, teachers agreed that they have positive attitude towards digital literacy program implementation as shown by a mean of 2.573 and that they believe digital literacy program implementation will be successful as shown by a mean of 2.540 but disagreed that they have embraced digital literacy as illustrated by a mean of 2.118. this corresponds to findings by Chai and Lim (2008) that educators who still hold the belief that pupils can only learn better when

exposed to the traditional ‘chalk and talk’ method do not see the need of pupils venturing and experimenting with computer-based technologies for learning.

4.7 Availability of Digital Literacy Content

The last objective was to establish digital literacy content availability for the public primary school teachers in the implementation of digital literacy programme in public primary schools in Imenti North Sub County. The respondents were to indicate their level of agreement with various statements on digital literacy content availability for the public primary school teachers. Their findings were as shown in Table 4.10.

Table 4.11: Agreement with Statements on Digital Literacy Content Availability

Head teachers	Mean	Std. Dev.
The Digital Literacy Program devices have the digital learning content	2.947	0.780
The ministry of education through KICD has provided the DLP guidelines	3.105	0.567
The DLP devices have the digital literacy syllabus content for the teachers	1.842	0.765
The DLP devices have the digital learning content	2.520	1.107
The laptops have the digital literacy syllabus content for the teachers	2.526	0.945
The ministry of education through KICD has provided the DLP guidelines	2.421	1.099

From the findings, the head teachers agreed that the ministry of education through KICD has provided the DLP guidelines as shown by a mean of 3.105, that the Digital Literacy Program devices have the digital learning content as indicated by a mean of 2.947 and disagreed that the DLP devices have the digital literacy syllabus content for the teachers as expressed by a mean of 1.842. This agrees with UNESCO (2005) report that an increasing percentage of information is held in the cloud, a growing number of public services have been digitized, and technology is becoming fundamentally integrated into educational curricula. Indeed, as the Internet

becomes ever more critical to the full enjoyment of human rights, being disconnected poses ever greater obstacles.

On the same, the teachers agreed that the laptops have the digital literacy syllabus content for the teachers as shown by a mean of 2.526 and that the DLP devices have the digital learning content as expressed by a mean of 2.520 but disagreed that the ministry of education through KICD has provided the DLP guidelines as illustrated by a mean score of 2.421. This is in line with Pierce and Ball (2009) who notes that the ICT sector plays an important role in facilitating children's access to the Internet and enhancing their digital literacy. Business can be a powerful force for connectivity, using its reach and resources to break down the digital divide and provide the benefits of technology to all.

4.8 Inferential Statistics

To establish the relationship between the independent variables and dependent variable the researcher conducted inferential analysis which involved multiple regression analysis. The coefficient of determination was carried out to measure how well the statistical model was likely to predict future outcomes. Table 4.11 presents the Model Summary.

Table 4. 12:Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.879	0.773	0.763	0.529

Adjusted R squared is coefficient of determination which shows the variation in the dependent variable due to changes in the independent variables, from the findings in the Table 4.11, the value of adjusted R squared was 0.763 an indication that there was variation of 76.3% on the implementation of digital literacy programme in public primary schools in Imenti North

Sub County due to changes in infrastructural preparedness, teacher competence, teacher perception and digital literacy content at 95% confidence interval.

Table 4.13: Analysis of Variance (ANOVA)

Model		Sum of Squares	Df	Mean Square	F	Significance.
1	Regression	88.414	4	22.104	76.477	.000
	Residual	26.012	90	0.289		
	Total	**114.426**	**94**			

The probability value of 0.000 indicates that the regression relationship was highly significant in predicting how the infrastructural preparedness, teacher competence, teacher perception and digital literacy content affected implementation of digital literacy programme in public primary schools in Imenti North Sub County. The F calculated at 5 per cent level of significance was 76.477. Since F calculated is greater than the F-critical (value = 2.4729), this shows that the overall model was significant

Table 4.13: Regression Coefficients

	Un standardized Coefficients		Standardized Coefficients	t	Sig
	B	**Std. Error**	**Beta**		
(Constant)	0.876	0.146		6.000	.000
Infrastructural Preparedness	0.764	0.296	0.668	2.581	.014
Teacher competence	0.819	0.314	0.721	2.608	.012
Teacher perception	0.706	0.239	0.616	2.954	.005
Digital Literacy Content	0.672	0.243	0.561	2.765	.008

The regression equation obtained from this outcome was: -

$$\mathbf{Y = 0.876 + 0.764X_1 + 0.819X_2 + 0.706X_3 + 0.672X_4.}$$

From the findings, the study found that if all independent variables were held constant at zero, then the implementation of digital literacy programme in public primary schools in Imenti North Sub County will be 0.876. From the findings, the coefficient for infrastructural preparedness is 0.764 which is significant since p=0.014 is less than 0.05, meaning that a unit

change in infrastructural preparedness leads to a 0.764-unit change in implementation of digital literacy program in public primary schools in Imenti North Sub County. The study also found that a unit change in teacher competence changes would lead to 0.819 units change in implementation of digital literacy programme in public primary schools in Imenti North Sub County. The variable was significant since p-value=0.012<0.05.

The study further found that a unit change in teacher perception would lead to 0.706 units change in implementation of digital literacy programme in public primary schools in Imenti North Sub County. The variable was significant since p-value=0.005<0.05. Finally, the study revealed that digital literacy content would lead to 0.672 units change in implementation of digital literacy programme in public primary schools in Imenti North Sub County if all other variables are held constant and the variable was significant since p-value=0.008<0.05.

Finally, teacher competence had the greatest effect on implementation of digital literacy programme in public primary schools in Imenti North Sub County followed by infrastructural preparedness in Imenti North Sub-County, Kenya, then by Teacher perception while digital literacy content had the least effect on implementation of digital literacy programme in public primary schools in Imenti North Sub County. All variables were significant since their p-values were less than 0.05.

CHAPTER FIVE

SUMMARY OF STUDY CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter focuses on the summary of the study and conclusions. It also presents recommendations for potential actions and suggestions for future research.

5.2 Summary of the study

The purpose of the study was to investigate the preparedness of public primary school teachers in the implementation of digital literacy programme in Imenti North Sub County Kenya. The study was guided by the following objectives; to assess the influence of infrastructural preparedness, teachers' competence, teacher perception and digital literacy content availability for the public primary school teachers in the implementation of digital literacy programme in public primary schools in Imenti North Sub County. The study adopted descriptive survey research design since it enabled correction of information from respondents without compromising their privacy. Simple random sampling was applied to sample 59 head teachers and 107 teachers. Data were collected using questionnaires, analysed and presented in frequencies and percentages. Data was presented in relation to the study findings; most of head teachers and teachers were male but the gender distribution met the threshold of the current Kenyan Constitution which stipulates that not more than two thirds. Most of the head teachers and teachers were youths hence most of them have an interest in digital literacy content. The study also found that head teachers and teachers had attained the minimum qualification of a primary school teacher which is a certificate. The findings in each objective are summarized as follows:

5.2.1 Digital literacy Infrastructural availability

The first objective was to determine the influence of infrastructural preparedness on implementation of digital literacy program in public primary schools in Imenti North Sub County. The study found that the school has a complete computer lab but not fully equipped, that the school has electricity and that the school has inadequate internet connections. The study also revealed that there are no enough digital literacy program devices for teaching and learning in the school and that there are no enough tablets for the learners. The study further found that there are no enough laptops for the teachers.

5.2.2 Teacher competence in implementation of Digital Literacy.

The second objective was to examine public primary school teachers' competence in implementation of digital literacy program in public primary schools in Imenti North Sub County. The study established that teachers in primary schools have basic computer skills and knowledge and that teachers in most primary school are trained on digital literacy. The study also found that there are Digital Literacy Program workshops every school holiday, that they have basic computer skills and knowledge and that teachers are trained on digital literacy. The study also found out that teachers have inadequate skills and knowledge in ICT integration in teaching and learning.

5.2.3 Teacher Perception on implementation of Digital Literacy

The third objective was to determine public primary school teacher perception in the implementation of digital literacy program in public primary schools in Imenti North Sub County. The study found that school heads encourage inter personal skills through team teaching with the teachers of this school, allow teachers to discuss with me the challenges they may be facing in the implementation of digital literacy program and encourage teachers on the

importance of digital literacy program but don't take teachers for induction programmes on digital literacy. The study also found that teachers have positive attitude towards digital literacy program implementation and believe digital literacy program implementation will be successful though they haven't embraced digital literacy.

5.2.4 Digital literacy Infrastructural availability.

The last objective was to establish digital literacy content availability for the public primary school teachers in the implementation of digital literacy programme in public primary schools in Imenti North Sub County. The study found that ministry of education through KICD has provided the DLP guidelines, that the Digital Literacy Program devices have the digital learning content and that the DLP devices have the digital literacy syllabus content for the teachers. The study also revealed that laptops have the digital literacy syllabus content for the teachers and that the DLP devices have the digital learning content although the ministry of education through KICD has provided the DLP guidelines.

5.3 Conclusions of the study

The study concluded that infrastructural preparedness influences implementation of digital literacy program in public primary schools in Imenti North Sub County significantly. Even though the schools have electricity their computer lab have not been fully equipped. The implementation of digital literacy program has been delayed by inadequate internet connections coupled with inadequate digital literacy program devices for teaching and learning in the schools. Also, there being inadequate tablets for the learners and laptops for the teachers have negatively affected the implementation of digital literacy program in public primary schools.

The study also concluded that teachers' competence has significantly affected implementation of digital literacy program in public primary schools in Imenti North Sub County. It was clear that teachers in primary schools have basic computer skills and knowledge where most of them are trained on digital literacy. This could be beneficial for easy and quick implementation of digital literacy program in public primary schools. It was also revealed that there are Digital Literacy Program workshops every school holiday to train the teachers aimed at ensuring successful implementation of digital literacy program in public primary schools.

The study further concluded that teacher perception influences implementation of digital literacy program in public primary schools in Imenti North Sub County significantly. Most of primary school heads encourage inter personal skills through team teaching with the teachers of this school and allow teachers to discuss with me the challenges they may be facing in the implementation of digital literacy program as well as encouraging them teachers on the importance of digital literacy program. It was also clear that teachers have positive attitude towards digital literacy program implementation and believe digital literacy program implementation will be successful.

Lastly the study concluded that digital literacy content availability for the public primary school teachers influences implementation of digital literacy programme in public primary schools in Imenti North Sub County significantly. Ministry of education through KICD was found to have provided the DLP guidelines and that Digital Literacy Program devices have the digital learning content. The study also found that the DLP devices have the digital literacy syllabus content for the teachers.

5.4 Recommendations

i. The study recommends that the teachers and instructors need to be taught in fundamental ICT competencies and ICT-primarily based teaching strategies to feel at ease about the use of the materials. it is similarly important to train them to combine ICT in their teaching techniques. Unfolding an information-based economy will therefore require the participation, contribution and partnership of a broad range of stakeholders including Government departments, regulatory authorities, broadcasters, telecom operators, private network operators, service providers, content providers, software developers, vendors, education providers and end-users. In this context, many cross-sectoral issues will also need to be addressed, notably to rapidly equip a whole generation of knowledge-workers with new skills that empower them to be productive in the changing ICT infrastructure.

ii. The study recommends that the governments should ensure that all the public primary schools are connected to wireless internet services. This will make the implementation of digital literacy programme in public primary schools successful since internet connection guarantees access to education materials and relevant information for the schools.

iii. The study also recommends the primary school assisted the both national and county government need to ensure that the schools have a complete computer lab that is fully equipped with enough laptops for the teachers and tablets for the learners. This will ensure that there is adequate facilities for implementation of digital literacy programme.

iv. The study further recommends that headmasters and parents need to set up administrative committees to manage ICT facilities has proven to be very effective in

ensuring the sustainability of ICT initiatives. While in many cases access to ICT is limited to a small group of interested teachers and students, participation of a larger group of administrative staff, teachers and students in projects is crucial to ensure the widespread institutionalisation and integration of laptops in educational institutions.

5.5 Suggested Areas for Further Study

i. The study recommends that the same study should be replicated in other counties in Kenya.

ii. The study also recommends that there is need to explore the challenges facing early stages of implementation of digital literacy programme in public primary schools.

iii. Further future studies can focus on the role of e-learning in preparation of adequate skilled manpower to spearhead the country towards the realization of vision 2030.

iv. Another study may be done to explore how ICT adoption in educational institutions has brought gains and losses. A critical analysis of both the gains and losses arising from ICT adoption in institutions.

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APPENDICES

Appendix I: Letter of Introduction

Felistas Wanjue Nyaga

Department of Educational

Administration and Planning

University of Nairobi

The Head Teacher,

_____Primary school

Dear Sir/Madam,

REF: PERMISSION TO CONDUCT A RESEARCH.

I am a student at the University of Nairobi currently pursuing a masters' degree in Curriculum studies. I am carrying out a research on "**Assessment of public primary school teachers' preparedness in the implementation of digital literacy programme in public primary schools in Imenti North Subcounty"** Your school has been selected for the study. The purpose of this letter is to kindly request for your permission to carry out the study in your school. The information you provide will be used for the purpose of the study. Be assured that your identity will remain confidential. Do not write your name anywhere in the questionnaire.

Thank you for your cooperation.

Yours Faithfully

Felistas Nyaga.

Appendix II: Questionnaire for Head Teachers

This questionnaire is designed to help the researcher assess the public primary school teachers' preparedness in the implementation of the Digital Literacy Program in public primary schools in Imenti North Sub County, Meru. The information you give will be used for the purpose of the study only. Therefore, do not write your name.

Section A: Demographic data

Please indicate the correct option by inserting a tick in the appropriate box provided

1.What is your gender?

Male [ ] Female[ ]

2. What is your age in years?

Below 25 [ ] 25-30 [ ] 31-35 [ ] 36-40 [ ] 41-45 [ ] 46-50 [ ]

51 and above [ ]

3. What is your highest professional qualifications?

Diploma [ ] Bachelors [ ] Masters [ ] PhD [ ]

If any other specify……

4. Kindly indicate your designation Head Teacher [ ] Deputy Head Teacher [ ] Assistant Teacher [ ]

5. Kindly indicate your level of Computer Application Training Certificate [ ] Diploma [ ] Bachelors [ ]

Section B: Infrastructural Preparedness

Indicate the extent to which you agree with the following statement using the following key: SA=Strongly Agree A=Agree D=Disagree SD=Strongly Disagree

Statement	**SA**	**A**	**D**	**SD**
The school has a complete computer lab but not fully equipped				
The school has electricity				
The school has inadequate internet connections				
There are enough digital literacy program devices for teaching and learning in the school				
There are enough tablets for the learners				

6.What ICT devices are available in the classroom……

7.What is ratio of sharing the devices in class……

8.In which areas of infrastructure would you need improvement……

9.Is the room where the devices are stored well secured…….

10.Comment on safety measures addressed……

Section C: Teacher competence

11.Indicate the extent to which you agree or disagree with the following using the following key: SA=Strongly Agree A=Agree D=Disagree SD=Strongly Disagree

Practices	SA	A	D	SD
Teachers in this school are trained on digital literacy				
Teachers in this school have basic computer skills and knowledge				

Section D: Teacher perception

12.Indicate the extent to which you agree or disagree with the following statement using the following key: SA=Strongly Agree A=Agree D=Disagree SD=Strongly Disagree

Statement	SA	A	D	SD
I encourage my teachers on the importance of digital literacy program				
I take teachers for induction programmes on digital literacy				
I allow teachers to discuss with me the challenges they may be facing in the implementation of digital literacy program				
I encourage inter personal skills through team teaching with the teachers of this school				

13.What improvement would you require to enable you access and integrate ICT teaching and learning materials in the implementation of Digital Literacy Program…..

Section E: Digital Literacy Content

14.Indicate the extent to which you agree or disagree with the following statement using the following key:

SA=Strongly Agree A=Agree D=Disagree SD=Strongly Disagree

Statement	**SA**	**A**	**D**	**SD**
The Digital Literacy Program devices have the digital learning content				
The ministry of education through KICD has provided the DLP guidelines				
The DLP devices have the digital literacy syllabus content for the teachers				

15.What content would you like to be improved on the DLP devices in order to enhance the digital learning……..……..

Appendix III: Questionnaire for Teachers

This questionnaire is designed to help the researcher assess the public primary school teachers' preparedness in the implementation of the Digital Literacy Program in public primary schools in Imenti North Sub County, Meru. The information you give will be used for the purpose of the study only. Therefore, do not write your name.

Section A: Demographic data

Please indicate the correct option by inserting a tick in the appropriate box provided

1.What is your gender?

Male [ ] Female[ ]

2. What is your age in years?

Below 25 [ ] 25-30 [ ] 31-35 [ ] 36-40 [ ] 41-45 [ ] 46-50 [ ]

51 and above [ ]

3. What is your highest professional qualifications?

Diploma [ ] Bachelors [ ] Masters [ ] PhD [ ]

If any other specify……

4. Kindly indicate your designation Head Teacher [ ] Deputy Head Teacher [ ]

Assistant Teacher [ ]

5. Kindly indicate your level of Computer Application Training Certificate [ ] Diploma [ ]

Bachelors [ ]

Section B: Infrastructural Preparedness

6.Indicate the extent to which you agree with the following statement using the following key: SA=Strongly Agree A=Agree D=Disagree SD=Strongly Disagree

Statement	**SA**	**A**	**D**	**SD**	
The school has a complete computer lab					
The school has electricity					
The computer lab has internet connections					
There are enough laptops for the teachers					

There are enough tablets for the learners					

Section C: Teacher competence

7.Indicate the extent to which you agree or disagree with the following statement using the following key: SA=Strongly Agree A=Agree D=Disagree SD=Strongly Disagree

Practices	**SA**	**A**	**D**	**SD**
There are Digital Literacy Program workshops every school holiday				
I have basic computer skills and knowledge				
I am trained on digital literacy				
I am skilled enough to handle a digital literacy class				
Teachers have inadequate skills and knowledge in ICT integration in teaching and learning.				

What areas were you trained in……..

Section D: Teacher perception

8.Indicate the extent to which you agree or disagree with the following statement using the following key: SA=Strongly Agree A=Agree D=Disagree SD=Strongly Disagree

Statement	**SA**	**A**	**D**	**SD**
I have embraced digital literacy				
Teachers believe digital literacy program implementation will be successful				
Teachers have positive attitude towards digital literacy program implementation				

9.What improvement would you require to enable you access and integrate ICT teaching and learning materials in the implementation of Digital Literacy Program……..

Section E: Digital Literacy Content

Statement	**SA**	**A**	**D**	**SD**
The DLP devices have the digital learning content				

The laptops have the digital literacy syllabus content for the teachers				
The ministry of education through KICD has provided the DLP guidelines				

10.How do you access and integrate ICT learning and teaching materials to improve knowledge and stimulate leaning in the classroom…….?

11.How do you access and integrate ICT learning and teaching materials to improve knowledge and stimulate leaning in the classroom **……**

APPENDIX IV: NATIONAL COMMISSION FOR SCIENCE TECHNOLOGY AND INNOVATION

APPENDIX VI : RESEARCH AUTHORIZATION