

**FACTORS INFLUENCING IMPLEMENTATION OF INFORMATION
COMMUNICATION TECHNOLOGY PROJECTS IN KENYA: A CASE OF
POLYTECHNIC CENTRES IN KITUI COUNTY**

BY

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for the Award of Degree of Master of Arts in Project Planning & Management of
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DECLARATION

This research project is my original work and has not been presented for any academic award in this university or any other institution of higher learning.

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DEDICATION

I dedicate this work to my loving husband James Kioko for giving me moral support all through.

Thank you and God bless you abundantly.

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I want to thank God for giving me the gift of life, good health and strength.

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ABBREVIATIONS AND ACRONYMS

DOEs	Desired Outcomes of Education
GoK	Government of Kenya
ICT	Information Communication Technology
LDCs	Less Developed Countries
MDGs	Millennium Development Goal
NACOSTI	National Commission for Science, Technology and information
PWC	Price Water Coopers
R&D	Research and Development
SPSS	Statistical Package for Social Science
UK	United Kingdom
USA	United State of America
USSR	Union of Soviet Socialist Republic

ABSTRACT

The world has been reduced to a global village as Information Communication Technology (ICT) is widely used in most of today's business activity and communication. As such, there is a growing demand on the educational institutions to integrate ICT in teaching the skills and knowledge students need for the 21st century. In recognizing this, Kenyan government has identified ICT as a key enabler to the attainment of Millennium Development Goal (MDGs) and the Kenya Vision 2030. This has forced the county government to align their goal with the national government pillars. As such Kitui County Government allocated Sh26.4 million to equip the 15 polytechnics with computers. However, only 5 polytechnic centers that were fully equipped by the end of 2016. Thus, the current study aims to investigate factors influencing implementation of information communication technology projects in Kenya with focus to polytechnic centers in Kitui County. The aim of this study was to examine how infrastructural facilities, stakeholder's participation, financial resources and employees' technical skills influence implementation of ICT projects in polytechnic centers in Kitui County. This research problem was studied through the use of descriptive research design. The target population was 2651 respondents which comprise of committee members, county government staff in ICT department, teaching staff and polytechnic students. Krejcie and Morgan formula was used to come up with a sample size of 317 respondents comprising 8 committee members, 12 county government staff in ICT department, 53 teaching staff and 244 polytechnic students. The study used questionnaires and interview guides to collect primary data. The study collected both qualitative and quantitative data which was coded and entered into SPSS (21). The study also conducted inferential statistic which involved coefficient of correlation, coefficient of determination and multiple regression. The study found that polytechnic had ICT infrastructure such as Internet networks; reliability source of energy; ICT equipment and information storage facilities. Found some had faulty computer and other ICT infrastructure which were not in operation thus hindering ICT project implementation. To ensure effective and smooth implementation of ICT projects through stakeholder participation, there has professional development of teachers through in-service courses. High cost of hardware and software applications is one of the problems hindering integration of ICT. The study revealed that lack of training and skills is an obstacle to implementation of ICT projects in polytechnics. The study found that there was a positive correlation between ICT infrastructures, stakeholder participation, financial resources and employee technical skills. The variables studied by this study contribute 55.1% to ICT project implementation in polytechnics. The study established that financial resources influences ICT project implementation to a great extent followed by ICT infrastructures then Stakeholder participation while technical Skills influence to a little extent to ICT project implementation. The study recommended that government(s) should ensure that the availability of ICT infrastructure such electricity is in place during ICT project implementation more so in remote and rural areas. National and County governments, Board of committee members and management should prioritize on ICT project implementation through allocating enough funds for its implementation. Technical skills should be trained to the tutors and staff responsible for ICT maintenance to ensure effective implementation of the ICT project.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

World has turned into a global village as a result of numerous ICT projects that have since been implemented (Gholami, Emrouznejad & Schmidt, 2011). ICT is becoming increasingly important in our day as well as in our education systems. As such, there is a growing demand on the educational institutions to integrate ICT in teaching the skills and knowledge students need for the 21st century (Buabeng, 2012). Realizing the effect of ICT on the work place and everyday life, today educational institutions try to restructure their educational administration in order to bridge the existing technological gap in school administration.

According to Price Waterhouse Coopers (2012) the core factors that motivate in establishment of ICT projects in any organization is the need to improve the business performance and to cope with the competition in the market, this was supported by 22.4% of the respondents that participate in the study conducted by Price Water Coopers (PWC). On the same study, 40.2% pointed that the key purpose of implementing ICT project in an organization is to generate more income while 30.1% purported that business nowadays implement ICT project with business oriented.

On the other hand, Flyvbjerg and Budzier (2011) argued that across all sectors most of the ICT projects implemented do not meet their intended purpose and they fail in their initial stage without even attaining their breakeven point. The success of any project in the process of implementation or formulation succeeds if it fully considers ICT application advantages. On their opinion Shenhar, Levy and Dvir (2007) consider a project to be success if it meets some distinctive characteristics which include high level of customer satisfaction, business objectives and goals, flexibility to future dynamic and if the project is proficient.

Gray and Smith (2011) pointed that governments in both developing and developed countries have not only been allocating resources to education but have also been undergoing an overhaul of educational reforms so as to match with the fast rate of globalization that has been influenced by the rapid technology change. This has been

a major focus in educational reform structure especially in the Less Developed Countries (LDCs) in Sub-Sahara Africa, parts of Asia and parts of the South American continent. The reforms have given birth to the introduction of information communication technology (ICT) projects into the education system. This introduction of ITC projects in schools takes us back to the history of globalization and technological change (processes that have accelerated in tandem over the past fifteen years) which have created a new global economy powered by technology, fueled by information and driven by knowledge.

According to a 2014 annual report by International Telecommunications Union (ITU), about 3 billion people (40% of the world's population) are using the internet and the number of mobile-broadband subscriptions has reached 2.3 billion with 55% of them in developing countries. Some of the top countries in the list of developed countries in the global ICT competitiveness are; Germany, United State of America (USA), Netherland, Switzerland and United Kingdom. According to World Economic Forum (2014) these are countries that host majority of the company that use a lot of resources in on research and development (R&D), highly complicated innovation, excellent ICT system is schools that work in collaboration with business partners in R&D. Some of these the companies in the global ICT includes Apple, Google, Microsoft, HP, Samsung that have managed to deliver some of the most successful ICT projects. According to Asaolu (2006), the US Department of Defense established the Advanced Research Projects Agency to promote research that would ensure that the USA compete with and excel over the Union of Soviet Socialist Republic (USSR) in any technological race.

Despite rapid adoption of ICT in projects, ICT projects have been noted by a number of researchers to be facing several performance challenges including failure in US, Europe, Australia and other parts of the globe. Previous studies from the year 2000 points that ICT project failures to be between 70-86% resulting in massive wastage of resources (British Computer Society, 2004; Mueller-Jacobs & Tuckwell, 2012). Dalcher and Genus (2013) reported estimates of wastage due to IT project failures at \$150 billion per annum in the US and \$140 billion in Europe. In Australia, 30-40 percent of ICT projects experience some form of escalation, with cost overruns

averaging 43-189 per cent; 30-40 per cent of projects resulting in no perceptible benefits; and 80-90 per cent of ICT investments failing to meet their performance objectives Public Accounts Committee (2014). In 2011, a report released by Oxford University in the United Kingdom (UK) found that large ICT projects were twenty times more likely to run out of control than other large infrastructure projects. According to Flyvbjerg and Budzier (2011), one in six projects reported an average cost overrun of 200% and a schedule overrun of almost 70%. Notably some of the biggest challenges of ICT projects are cost overruns and schedule overruns placing ICT projects failure rate at 70% (Mueller-Jacobs & Tuckwell, 2012; Kyunguti & Makau, 2014).

In Africa, most African countries today recognize ICT sector as a critical component and a contributor to the national economy. As such a number of these countries have come up with policies and strategies to help align ICT initiatives and projects with national strategic priorities and economic growth (IST-Africa Consortium, 2014). Kenya has been home to key innovative projects in the ICT sector with a case in point being Safaricom's M-PESA widely viewed as a success story globally (Jack, Suri, & Sloan, 2010). M-Kesho is another popular mobile banking product in Kenya developed and promoted by Safaricom and Equity bank (Lule, Omwansa, & Waema, 2012). Other initiatives include ICT incubation, nurturing ICT innovation and creating an entrepreneurial mindset, which resulted in establishment of incubators like iHub, Strathmore University's iLabAfrica, Nailab, and mlab (International Data Corporation, 2014). Other than the government, private developers have also embarked on projects to lay out fiber-optic networks terrestrially across the country that has seen the number of business and houses who can access fiber optic internet links rise. All these initiatives and projects by the government and private sector are aimed at returns on investment be it financial or in terms of meeting requirements of the intended beneficiaries.

Like in any other country, Kenya also faces similar implementation challenges in ICT projects, despite the remarkable growth of ICT sector coupled by opportunities created by government strategies on ICT. Performance of ICT projects has still remained a challenge experienced with projects being run by both private and public

sector. According to Kabutu (2013) software development and implementation is a major challenge in Kenya due to high failure rate in public sector. The laptop project's (a flagship project of the Jubilee government) chances of success appears to be in jeopardy after it failed to kick off two years later (Moses, 2014).

In Kitui County government, which is the focus of this study, embarked on an ambitious plan to rejuvenate 15 youth polytechnics by introducing an additional course in computer packages. The county government allocated Sh26.4 million to equip the 15 polytechnics with computers. The project was aimed to be completed by end of March in 2017 where all the 15 ICT centers aimed to receive 16 computers and associated accessories. The 15 ICT centres that were selected were from the following polytechnics, that is, Kathivo Youth Polytechnic; Waita Youth Polytechnic; Ikuuni Youth Polytechnic; Kyatune Youth Polytechnic; Ithiani Youth Polytechnic, Kitui Polytechnic, Katulani Youth Polytechnic, Kiiio Youth Polytechnic, Kinakoni Youth Polytechnic, Kisasi Vocational Training Centre, Migwani Youth Polytechnic, Mutonguni Youth Polytechnic, Mulango Youth Polytechnic. Kinakoni Youth Polytechnic and Tseikuru Technical Training Centre. The Polytechnics are distributed across all the eight sub-counties in Kitui County. The main courses offered in these polytechnics include; filter- general, motor vehicle mechanics, welding, plumbing, panel beating, spray painting, carpentry, masonry, dressmaking and driving.

1.2 Statement of the Problem

Kenya government, consider ICT as the key factors that enhance economic growth, this has been manifested by immense effort that the government has directed in ICT development (Gichoya, 2010). The economic growth was expected to realize positive growth for a period of 3 years from a 5% in 2015 to 6% in 2018, supported by ICT application in major sectors such as education, health, agriculture, security among other sectors. The Government of Kenya has identified ICT as a key enabler to the attainment of MDGs and the Kenya Vision 2030 (Government of Kenya, 2014). ICT is hoped to transform Kenya into a knowledgeable and information based economy by enabling access to quality, affordable and reliable ICT services. As such in 2013, the government recognized that there is need to equip learning institutions with modern technology and as a result the government embarked on ICT Initiatives and projects

by conducting a pilot study to 150 public primary schools out of 22,000 public primary schools with laptop programme which was conducted across the country in year 2016 (Mue, 2013).

With rapid change from analogue to digital arena, county governments realized the need to change from analogue to digital generations. This was accelerated by the need to equip the generation with the changing technology. In response to this, Kitui County Government embarked on an ambitious plan to rejuvenate 15 youth polytechnics by introducing an additional course in computer packages (Kitui County government Education Office, 2016). The county government allocated Sh26.4 million to equip the 15 polytechnics with computers. The project was aimed to be completed by end of March in 2017 where all the 15 ICT centers will have received 16 computers and associated accessories. However, only 5 polytechnic centers that were fully equipped by the end of 2016 this includes Kathivo, Waita, Ikuuni, Kyatune and Ithiani polytechnics, thus there are 10 more polytechnics that have not been fully realized the existence of the project (Kitui County Government Education Office, 2016). This clearly indicates that there is more effort required to ensure the implementation of ICT projects is successful.

Local studies done include; Karimi (2012) who conducted a study on factors affecting the use of information and communication technology in teaching and learning in secondary schools in Kangema- Murang'a County, Otundo (2014) who did a study on factors influencing the implementation of information communication technology projects in public secondary schools in Kwale County, Kenya, Muchiri (2014) who did a survey on factors influencing school principals' integration of ICT in administration of public secondary schools in Githunguri Sub County, Kiambu County, Kenya and finally Muriko (2015) who conducted a study on factors affecting utilization of ICT in administration of public secondary schools in Kiambu sub-county - Kiambu County, Kenya. Despite the importance role played by the ICT none has been done in polytechnics schools. Thus, the current study aims to investigate factors influencing implementation of information communication technology projects in Kenya with focus to polytechnic centers in Kitui County.

1.3 Purpose of the Study

The purpose of this study was to investigate factors influencing implementation of Information Communication Technology projects in Kenya with focus on 15 polytechnic centers in Kitui County.

1.4 Objectives of the Study

This study focused on following objectives:

- i. To examine how infrastructural facilities influence implementation of Information Communication Technology projects in polytechnic centers in Kitui County.
- ii. To examine the influence of stakeholder's participation on implementation of Information Communication Technology projects in polytechnic centers in Kitui County.
- iii. To determine influence of financial resource implementation of Information Communication Technology projects in polytechnic centers in Kitui County.
- iv. To assess how employees' technical skills influence implementation of Information Communication Technology projects in polytechnic centers in Kitui County.

1.5 Research Questions

The study was guided by the following research questions:

- i. To what extent do the infrastructural facilities influence implementation of Information Communication Technology projects in polytechnic centers in Kitui County?
- ii. How does stakeholder's participation influence Information Communication Technology projects implementation in polytechnic centers in Kitui County?
- iii. What is the influence of financial resources in Information Communication Technology projects implementation in polytechnic centers in Kitui County?

- iv. How do employee's technical skills influence the implementation of Information Communication Technology projects in polytechnic centers in Kitui County?

1.6 Basic Assumptions of the Research

This research assumed that infrastructural facilities like electricity and computer laboratories had an influence in the implementation of ICT projects in polytechnic centers in Kitui County. The study further assumed that due to increased financial resources allocation by the county through ministry of education to polytechnics for ICT projects development and implementation in educational institutions had increased the rate of ICT projects implementation in polytechnic centers. In addition, the study also assumed that stakeholders and administrators are key players in the increased rates of ICT projects implementation in polytechnic centers in the county government.

The researcher assumed that the respondents are aware of factors influencing implementation of Information Communication Technology projects in Kenya and be able to respond accurately. The researchers also aimed that respondents will be open, compliant, objective and kind in their feedback to the research instruments and will be there to give response to the research instrument in right time. Additionally, the researcher assumed that the respondent will be sincere and open in responding fully to the research questions.

1.7 Limitations of the Study

The researcher encountered various limitations that hinder access to information that the study sought. One of the limitations was that some of target population of this study failed to provide the information that this study sought with fear that the information provide may be used in negative way. To cope with this challenge the researcher gave an introduction letter and authorization letter from the university and National Commission for Science, Technology and information (NACOSTI) that assured them that the responses they provided will be used for academic purpose only. In addition, most of these polytechnics are located in rural areas where roads are in poor condition and accessing them was difficult.

1.8 Delimitation of the Study

The research examined factors influencing implementation of Information Communication Technology projects in Kenya. The research targeted polytechnic administration staff and sub-county employees in the ministry of education. The study adopted questionnaire to collect primary data from the sample selected that and be used in analyzing the study finding. The data was sought from committee members, county government staff in ICT department, teaching staff and polytechnic students.

1.9 Definition of Significant Terms used in the Study

Financial resources Refer to the funds available to enable implementation of ICT projects such as purchase of computers and its peripherals

ICT Infrastructure Refers to physical equipment/hardware and software that enables an ICT network to function.

Implementation of ICT projects This is ability of putting a project plan into execution and becoming a reality in ICT projects.

Infrastructure facilities Refer to a set of interconnected structural elements that provide framework supporting an entire structure of development such as buildings, laboratories and electrical connections.

Polytechnic Center This is an institution of higher education offering courses mainly vocational subjects for example masonry, dressing making.

Stakeholders' participation This is the involvement of the local members of the society in the implementation of ICT projects.

Technical skills These are abilities required to accomplish specific tasks in ICT projects for example ability to install and operate a computer.

1.10 Organization of the Study

This study is categorized in to five chapters. Chapter one provides background of the study, statement of problem, purpose of the study, objectives of the study as well as research questions. The chapter also presents basic assumptions, limitations, delimitation of the study and definition of significant terms used in the study. Chapter two provides literature review on previous study done by other scholar, academician or researcher related factors influencing implementation of Information Communication Technology projects in Kenya. Chapter three entails research methodology which will be employed to gather and evaluate data while clearly specifying the target population that the study will focus on, the sample population as well as the data collection research instrument. Chapter Four explains how data was analyzed, presented and interpreted while Chapter Five provides summary of the findings, discussion, conclusions and recommendations made based on the findings as well as suggesting the areas for further research in the study area.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter entails contribution from other academicians, researchers and scholars on factors influencing implementation of ICT projects in Kitui County. The chapter is categorized into Implementation of Information Communication Technology Projects, Infrastructural Facilities and Implementation of ICT Projects, Stakeholder Participation and Implementation of ICT Projects, Financial Resource and Implementation of ICT Projects, Theoretical Framework, Conceptual Framework, Research gap and Summary of Literature Review

2.2 Implementation of Information Communication Technology Projects

Implementation is referred to an approach of introducing innovation in an institution and structuring its applicability and use. Nowadays, either developed or less developed countries have embraced ICT as the best tool to enhance their economic growth in their countries. In developed countries, various approach and process have been used to ensure successful implementation of ICT in education sector. For example, in a journal published in New Zealand (2006) by the Ministry of Education on ICT Strategic approach for Education' recognized ICT as the best tool for managing education curriculum with aim of attaining education objectives for the national development. The survey posed a question why is ICT application necessary for teaching and learning? The study found that partnership between education sectors, stakeholders and the government agencies were vital in implementation process of the ICT in the education sector. The approaches were recognized to have brought a solution to the challenges arising from the teaching and learning process.

In developed nations, such as USA, the government allocates even more than \$10 billion in every year in learning technology within public learning institutions (Brunk, 2008) while almost AUD\$8 billion are allocated for the same in Australia (Lane, 2012). Most of the frequently asked question in these projects is what could be the factors that affect effective implementation of ICT in learning organization such as primary schools, secondary, polytechnics, colleges and universities? In other studies conducted across the globe, Wozney et al, (2010) and Balanskat (2012) found that

North America has directed a lot of effort in ensuring ICT projects formulated are effectively implemented and that the aim of such projects is not only be completion and implementation but also contribute positively to the academic performance in the school. Halewood and Kenny (2008) pointed that some developing nations, such as India adopted ICT programs in their institution to streamline education system in tertiary and vocation education via implementation of ICT projects to empower human capital in the sector.

Al-Harbi (2014) conducted a study in Saudi on ICT project implementation in learning institutions; he found that ICT was regarded as vital tool in enhancing teaching and learning process, integration of teaching and learning process, learning process and testing of teaching process managing as examination results. Al-Harbi (2014) argued that if government and other agencies are determined to make this process effective they can solve these challenges to ensure they are success factors that contribute to effective implementation of the ICT projects. In response to these, Saudi government allocated more fund in ICT projects with aim of improving education particularly in public schools from primary to secondary. The government was motivated by the fact that ICT contribute positively any country economic growth and that cannot be ignored at all. For instance, in 2005, Saudi government budgeted for 25% (more than £36 billion) of its total budget in education to enhance implementation of ICT project in education sector (Ministry of Finance, 2015).

In Sub-Saharan, if the countries in this continent aim to fight illiteracy, bridge technological and economical gap in as compared to the rest of the continents they should encourage application of ICT in education sector particularly in higher institution of learning (Farrell & Shafika, 2011). South Africa, which is assumed to have ahead in development in this continent it is still experiencing challenges in implementation ICT projects in education sector (Ageel, 2011). According to Almadhour (2010) in South Africa there is still a lot which is required to bridge the gap that exist in between implementation of ICT projects in education sector. In other studies conducted in South Africa by Oyaid (2009); Almadhour, (2010); Almalki and Williams (2012) and Al-Harbi (2014) they found that there is need to introduce new strategies that support implementation of ICT projects in education practices and

ensure effective implementation. Even though South Africa government allocated R105.5 billion (estimated USD\$15 billion) in ICT implementation in education sector, there is lack of effective strategies that are streamlined to education system in the country (Almadhour, 2010).

Uganda government developed a strategic policies in 2003 that aimed at encouraging ICT project implementation in education curriculum with hope the knowledge gained in the process of learning will add some knowledge in the economy. Ssewanyana and Busler (2007) pointed that the ministry also ensured that the policies developed related to ICT implementation are friendly to economic growth and are flexible to education curriculum. In Tanzania, most of the higher learning institutions have not successfully implemented ICT project reason being that most of areas are not connected with the electricity particularly in rural areas. Additionally, the areas which are connected to electricity experience frequent electricity breakdown making it difficult to implement ICT project (Farrel, 2011). In Kenya, government for the last five years has allocated some fund to enhance the process of ICT project implementation more so in ensuring that relevant infrastructure that support the process are available. The process of funding is achieved through collaboration between development partners and government ministries and agencies. Development partners contribute the largest portion of the fund in these initiatives and in form of technology development while the Kenya government contributes in form of staff support, technical support and infrastructure including buildings. Kenya government, like any other country faces similar challenges that affect successful implementation of ICT projects.

ICT in Kenya is regarded to be the main tool that drives effective economic growth and lot of effort has been directed to this initiative for the last five years (Gichoya, 2010). According to the (Africa Development Bank, Organization for Economic Co-operation Development and United Nations Development Programme report, 2014) Kenya's economic growth is predicted to experience recommendable improvement of 1% from 5% in 2013 to 6% from 2015 to 2016; this achievement will be contributed by embracing ICT across all sectors. However, if the challenges that hinder ICT

project implementation will not be handled the growth expected in the economy will not be achieved at all.

2.3 Infrastructural Facilities and Implementation of ICT Projects

Information Communication Technology refers to all technology gadgets that ease conveyance of information and help in communication as well as service delivery (Brock, 2000). In this study ICT refers to those technology gadgets such as computer which are purely used for dissemination of knowledge to the students. Application of modern ICT hardware and software is paramount to the formulation and adoption of technology (Gulbahar, 2005). Omufwoko, (2009) points out that, the computers should have latest version and computer packages to enable students perform a variety of tasks. She notes that such hardware must be the latest multimedia with adequate storage capacity and memory. Akunja (2011) observes that lack of adequate ICT infrastructure has hampered provision of efficient and affordable ICT services in the country. She suggested that emphasis should be placed on provision of software development. Other consideration should be Promotion of local manufacture and assembly and implementation of ICT policy of framework of 2006.

Hawkins, (2004) in Ten lessons for ICT and Education in the developing world noted that while many Ministries of Education around the world have made the commitment to computerize the schools, few have well established infrastructure to fully integrate the use of computers as Pedagogical tools in the classroom. Educational Institutions are required to develop an ICT strategy that incorporate the ICT infrastructure and goals of the institution and how this will be met using ICT and provide a supporting framework for implementation. Sheingold and Hadley, (1990) study observed that, teacher worked in schools where hardware and access to resources were twice the average on ICT use, were comfortable with technology and used computers for many purposes. It is important that all sectors of the education understand the benefits of investing in ICT and the infrastructure that is required for introducing ICT.

In Africa, the introduction of computers into most organization is a recent phenomenon OECD (2001). High subscription and ICT infrastructure costs coupled with the poor quality of service providers and the lack of basic infrastructure such as

electricity can act as barriers to the use of ICT in most organizations. In Nigeria, ICT Application in Secondary Schools, is attributable to several factors. Research confirms that ICT development and application are not well established in Nigeria because of poor information infrastructure (Osugwu, Prince, 2010). Kenya has made remarkable progress putting in place an ICT policy framework and implementation strategy, complete with measurable outcomes and time frames (World Bank, 2010). The process has had the benefit of sound advice from officials and stakeholders and, perhaps more importantly, strong leadership from the office of the Permanent Secretary of the Ministry of Education. However, universal implementation is challenging given the lack of sufficient resources, national ICT infrastructure, and even electrical supply – particularly in the rural areas (GOK, 2010).

2.4 Stakeholder Participation and Implementation of ICT Projects

One way in which schools can move to student-centered use of ICT is through links with the wider community. Such links enable the development of a more authentic and contextualized approach to learning supported by ICT tools (Demetriadis et al., 2003). Thus, human responsibilities, roles and priorities within the community must be rearranged. For example, assessment methodologies should be redesigned to allow all interested community members to play an appropriate role.

In this respect, Granger and his colleagues (2002) studied in four schools to identify factors contributing in successful implementation of ICT by teachers. Based on their findings, they concluded that successful implementation required not only computers but also commitment and community, with the last two being closely interlinked. Also, they added that the schools worked continually with questions of equity, privilege, language, and community support. Each aimed to develop a philosophy of pedagogy informed by the unique characteristics of their specific communities. In addition, Kington et al. (2002) carried out a study on innovative practice using ICT in schools. They showed how a school used the introduction of laptops to build up a 'connected learning community' in an area of lack of social and economic context.

Multi-stakeholder partnerships (MSPs) and other partnerships e.g. public-private partnerships (PPPs) have become important vehicles for drawing together the resources and know-how needed to make progress in a specific field or area especially

in the newly introduced idea of ICT in education. They are formed to expand the reach, improve the quality, increase the supply, and/or improve accessibility of services to identified beneficiaries/communities (Akaslan & Law, 2010). A multi-stakeholder partnership in the e-schools and ICT in education context can broadly be defined as a partnership that exists when government officials or agencies join with the private sector, civil society, professional development and training institutions, technology and telecommunication providers, educational content and ICT application developers, teachers, parents and learners to work towards and attain a shared goal (World Bank, 2013). Such partnerships may have the following characteristics: Bring together diverse partners representing different groups and/or interests; Partners work together, have a shared vision, and work towards common goals and objectives, Partners have a comprehensive and coordinated approach, Each partner contributes something to the process, e.g. time, funding, expertise, and/or other resources, and, Decision-making and management responsibilities are shared (though there may be a secretariat coordinating and monitoring the activities of various partners).

A report by MOE (2010) on Singapore ICT levels in schools spelled the major roles played by the MOE HQ as a major stakeholder in integrating ICT in schools as follows: Sets the strategic directions for schools, Collaborates with schools to formulate effective policies and practices, Supports principals and teachers to do an excellent job, Works in tandem with schools to inform and clarify policy positions to the public, Supports teachers in helping their students achieve the Desired Outcomes of Education (DOEs), Collaborates with other government agencies and non-governmental organizations to formulate effective programmes and practices that are geared towards ICT adoption in school (Castro & Aleman 2011). The community plays a role in ICT integration in Singapore whereby: It welcomes and encourages the young to be involved in the life of the community and elevate the ICT levels of the community, upholds and transmits the right values and attitudes to the young as far as the dangers of the newly adopted ICT is, recognizes the variety of abilities and talents displayed by the young and sees the worth in each child, offers scholarships and bursaries to students and teachers who want to pursue higher in ICT, provides support

to families and students who are in need of assistance in the field of ICT education (Haverila, 2011).

2.5 Financial Resource and Implementation of ICT Projects

The cost of ICT materials was considered to be among the problems that could negatively affect the implementation of ICT. The higher the cost of computers and their accessories, the fewer computers one can buy with the limited resources (Sharma, 2011). According to Tsubira and Mulira (2004) the cost of a Desktop Computer connected to the Internet is often prohibitive for most people in developing countries and for those who can afford a PC, routine maintenance, virus protection and servicing, is yet another problem that is not easily manageable by the first generation computer users, technology development has proven to be quite expensive in all areas of consideration and infrastructure. Makau (1986) established that financial resources form a key factor to the successful implementation and integration of ICT projects.

Limited financial resources in ICT implementation is reported as being a great impediment, ICT and lack of computers and software in an organization may limit what organization are able to do with ICT (Mumtaz, 2000). Zziwa (2001) in her paper on networking and use of information technologies in the French education system reported that the main obstacle to ICT project implementation in schools is the high cost of computer peripherals. Aduwa and Lyamu (2005) established high cost of hardware and software applications, as one of the problems hindering integration of ICT in Nigerian secondary schools. Tsubira and Mulira, (2004) focusing on the challenges of integrating ICT in enterprises reported that financial resources to buy computers and software are relative to the perceived benefits. Developing countries have a significantly lower rate of diffusion and use of ICT than developed countries (Sharma, 2011). Malcom and Godwyl (2008) in the study, diffusion of information communication technology in selected Ghanaian secondary schools reveals that one fundamental problem facing ICT implementation in schools is high cost price of computers.

The main obstacles in the growth of e-learning in Iran is not the high price of computers, but rather the lack of government budgets for equipping universities, schools and public places with new computers and suitable hardware infrastructure (Ensafi et al, 2007). It is believed that successful use of ICT implementation is hampered by high cost of ICT infrastructures. The price of computer hardware and software continues to drop in most developed countries; the cost of computers is more expensive due to high levels of poverty and inadequate funding (Sife et al, 2011). In support of this statement, it was reported that while a desk top computer may cost less than a month's wage in the USA, the average worker in developing countries may require more than six months' wage to buy one. The study further revealed that, apart from the basic computers themselves, other costs associated with peripherals such as printers, monitors, projectors, modem, and extra disk drives could be beyond the reach of some institutions of higher learning in most developing countries.

Ssewanyana and Busler (2007) in their study, adoption and usage of ICT in developing countries, stated that usage of computers and internet is high in medium and large firms, and especially firms owned by foreigners. The small firms which are mainly locally owned, have low usage due to the high cost of required investment, limited knowledge and skills, and being very responsive to charges. The findings further indicate that people do appreciate the contribution of ICT to the performance of their firms, but the various barriers such as high costs of hardware, software, Internet and ICT professionals among others are a hindrance to their progress. According to When the cost of ICT training materials is high, ICT implementation in institutions of higher learning tend to be minimal and vice versa. High cost of ICT training materials could be assumed a barrier to teaching using computers in institutions of higher learning (Namukangula, 2007).

2.6 Employees' Technical Skills and Implementation of ICT Projects

Skill is the ability to do something well (Hornby, 2006). Skills development in this study will refer to special ability (or expertise) enabling one to perform an activity by using a computer efficiently and its related peripherals in either teaching or learning. The scarcity of adequately trained and experienced analysts, software engineers, systems and network managers, restrains ICT implementation. Lack of ICT expertise

and confidence was found to be a constraint for implementation of ICT. Kasozi (2003) highlighted the problems of ICT implementation on lack of technical personnel. Getting computers into universities and institutions is relatively easy but keeping them up and running is a greater challenge. The research further showed that in most developing countries laboratory coordinators in some institutions of higher learning are not skilled enough in resolving technical problems. According to Aryatuha (2007), most of the African economies are so poor and where ICT is introduced the competency to handle it is very low since the capacity to train staff is limited because of lack of enough resources.

Vigorous training is required in order to become a computer knowledgeable individual, however, high cost of ICT training materials would hamper this process (Ssewanyana et al, 2007). Though many researchers advocate for the use of computers in management activities, there are quite a number of problems which affect the effective utilization of computers. In agreement with the statement, Zziwa (2001), in his paper on networking and the use of information technologies, pointed out that computer utilization is affected by training, organization, and low supply of technical skills required.

Bates (1997) reported lack of training and skills as obstacle to ICT use in institutions of higher learning in Tanzania, while Agaba (2003) found lack of skills as one of the problems explaining underutilization of Makerere University Library electronic information resources by academic staff. Farrell (2007) established that, though the Faculty of Computing and Information Technology at Makerere University trains staff in e-learning and support e-learning in the whole university, comparatively few teachers have the skills to make pedagogical use of ICT for teaching across the curriculum. This could be due to inadequate ICT training skills, lack of time and negative attitude by teachers towards ICT implementation. Peansupap and Walker (2005) found lack of ICT skills as a key barrier to adopting and implementation of ICT projects in Australian construction organizations. Hawkins (2002) established that most teachers in the developing world are intimidated by technology and are thus comfortable with their own old teaching styles.

Mooij and Smeets (2001) in the study aimed to investigate the implementation of ICT and its support within the secondary schools in Holland found that teachers' competence and confidence in their skills were one of the main factors to influence teachers' willingness to integrate technology in their teaching-learning process they claimed that educator's lack of knowledge is a serious hindrance to integrate ICT into secondary schools. Educators must attain and maintain an assured degree of technological competence to make instructional strategies more effective. This is supported by Albirini (2006) who stated that technology competence comprises not only technology knowledge but also the skills and experience essential to put them into use. Technology competency allows the teachers to turn into most efficient individuals in dealing with daily tasks such as to communicate with the students' parents; to keep records; to do research in their option domain; and to prepare presentations (Priscilla et al, 2008).

Knowledge creation and the ability to translate ICT skills and knowledge to the benefit of society are critical. ICT skills are required for empowerment to enhance value and create opportunity through new technologies. Human capital must be developed through training, research and capacity building. However, organizations such as universities and institutions of higher learning, research centers, polytechnics and training centers in most developing countries are affected in this area. Ensminger et al (2004) found that low levels of skills and the need to train users influenced ICT implementation. Dalton (1998) emphasized the importance of training for the adoption and diffusion of computers in schools. Malcolm and Godwyl (2008) reported that lack of professional development programs for teachers to upgrade their skills on emerging technologies is a hindrance to ICT implementation.

2.7 Theoretical Framework

This study was grounded on Roger's theory of Diffusion of Innovations. The theory points out how, why and at what support the spread of technology through a given structure institution. This theory was advocated by French sociologist Gabriel Tarde in early 1930. The diffusion research focused on factors that enhance adoption and acceptance of new ideas, products or practices in a given institutions or in a given structured social system.

Rogers (2003) reviewed this theory, and from that time it was renamed and referred to Roger's theory of diffusion of innovation up to date. In his survey, he explains what factors influence a given society to tend to accept a new way of conveying information such as use of internet and ICT application. The theory considers changes as being accepted slowly by the evolution happening in life and environment in which individuals are operating in hence they adopt the will of the society as they change with the changes in life behaviors.

Thus Rogers' diffusion innovation theory is the best suited theory to investigate the factors that influence rate of technology implementation due to the rising need of ICT in t recent decades.

2.8 Conceptual Framework

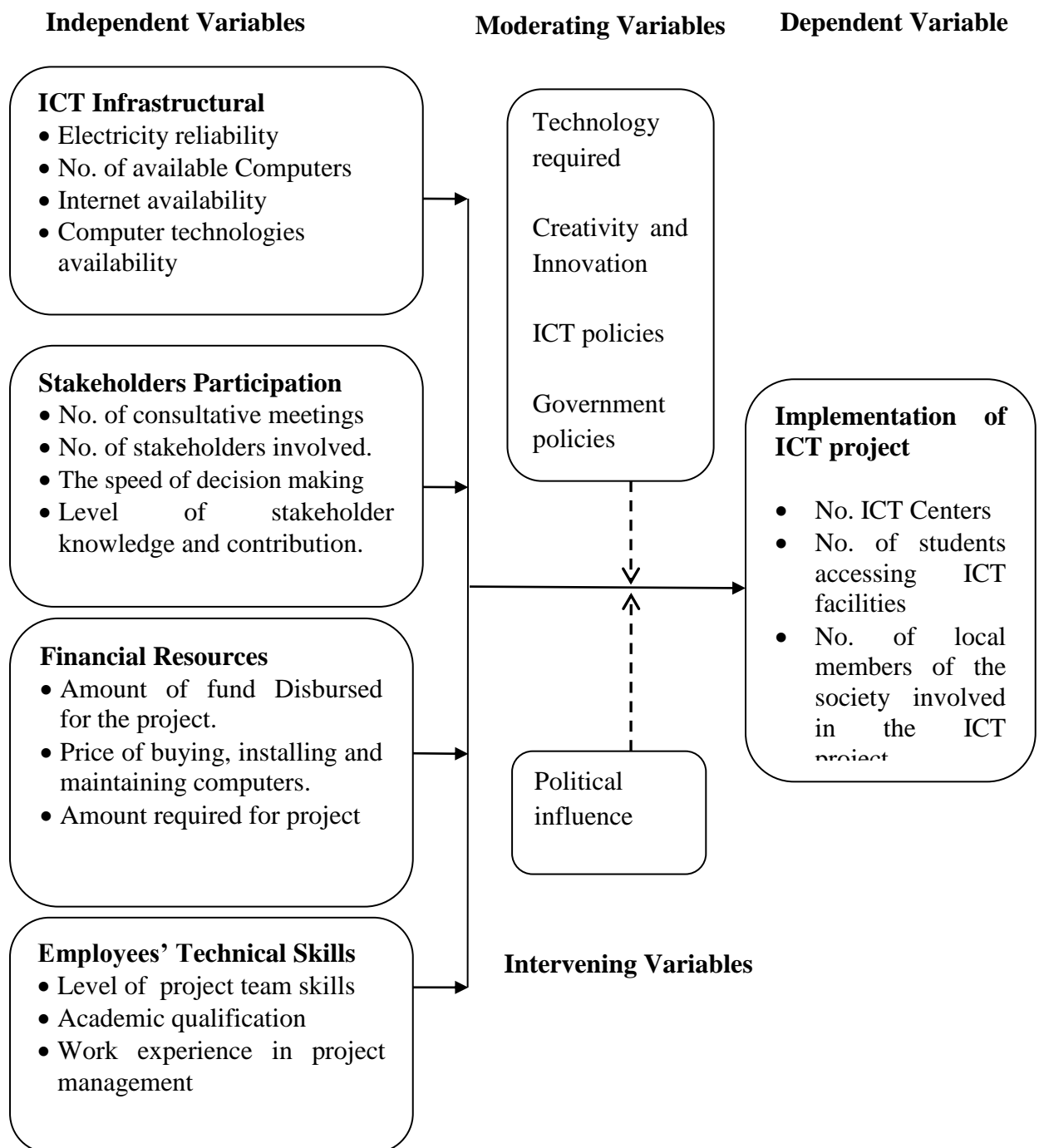


Figure 1 Conceptual Framework

2.8.1 Relationships of variables in the Conceptual Framework

This section explains the relationship among independent, moderating and dependent variables on how they interrelate to successful implementation of ICT projects. As

shown in figure 1, the framework adopted by this study considers infrastructural facilities, stakeholder participation, financial resources and employees' technical skills as the main factors influencing implementation of ICT projects in Kenya. The framework further identifies the moderating variables that may influence implementation of ICT projects which include the technology required, creativity and innovation, ICT policies, political influence and already existing government policies. Based on the conceptual framework, ICT Infrastructural includes electricity reliability, no. of available computers, internet availability and computer technologies availability. Stakeholders' participation involves consultative meetings, the actual no. of stakeholders to be involved, the speed of decision making and level of stakeholder knowledge and contribution. Financial resources includes amount of fund disbursed for the project, price of buying, installing and maintaining computers and amount required for the project. Lastly employees' technical skills includes level of project team skills, academic qualification of the employees and duration of working in project management

2.9 Research gap

Researchers in the past have had interest in ICT implementation in several ways. For example, Salih (2004) studied factors affecting the application of ICT in distance education in Turkey whereas Bagchi and Godwin (2007) looked at factors that drive adoption of ICT in Africa and in the Organization of Economic and Cooperative Development (OECD) set of nations.

Mugisha (2007) conducted a survey on problems related to ICT implementation in the curriculum of Core Primary Teachers' College in Kabale District. The selected problems in the study were on tutors' attitude towards ICT, their ICT use in teaching, and the availability of ICT. Much of the study considered problems related to ICT implementation and the population studied consisted of only tutors in core primary teachers' college and thus leaving a gap to be closed by this study by considering both the teachers / tutors and students in Polytechnic centers in Kitui County.

Analysing the data quantitatively and qualitatively, Akankwasa (2008) studied teachers' attitudes, skills and behaviours related to ICT use at Christian University, Mukono. To find out the relationship between variables, data was analysed using

Pearson chi-square. This study therefore is deemed wanting to use another method of analyzing data which the previous study did not explore. Munyantware (2006) studied problems affecting teacher's adoption of ICT in secondary schools in Kisoro District. In the study, Munyantware found out that teachers' technological skills were critical for successful ICT implementation in the classroom. However, the study targeted only science and mathematics teachers in secondary schools and thus, leaving a gap for this study to close by investigating how all employee technical skills influence ICT implementation.

An examination of past research studies and reports on ICT implementation in schools show that there are two main factors that affect teachers' uptake of ICT. These are manipulative and non-manipulative school and teacher factors. Research on the implementation of ICT in schools has also shown that these school and teacher factors are interrelated. The success of the implementation of ICT is not dependent of the availability or absence of one individual factor, but is determined through a dynamic process involving a set of interrelated factors (Brummelhuis, 2010). In spite of this massive spending and county governmental support, most institutions of higher learning in Kenya, both tertiary and universities, depended on manual systems, with little use being made of computers in teaching, admission, examination, registration, students' records, finance and accounting and dissemination of modern skills. Implementation of ICT projects in polytechnics still lags behind in county levels. There is still a real gap between ICT implementation which this study aims to bridge with focus to Kitui polytechnics.

2.10 Summary of Literature Review

Reviewed literature has shown that ICT integration in many secondary schools globally is still very low. This is despite the fact that efforts by national governments, development partners and non-governmental organizations have seen many of these schools get computers. Also, poverty, power failure and high ICT maintenance costs have been revealed as the main challenges towards ICT implementation in learning institutions. Most administration staffs have been depicted as resistant to technological change. Lack of ICT literacy among learning institutions has been identified as another barrier to ICT integration in organizations. ICT integration has

many benefits some which are personnel administration, student administration, resource administration, financial administration and general administration. This will not only lead to effective school administration but also ensure quality teaching and learning.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the design, population, sampling strategies, data collection methods and instruments, data quality control, procedure and data analysis to be used in the study.

3.2 Research Design

Research design is the scheme, outline or plan that is used to generate answers to research problems. This research problem will be studied through the use of descriptive research design. According to Kothari (2007) descriptive survey research design is a type of research used to obtain data that can help determine specific characteristics of a group. The main advantage of descriptive survey research is that it has the potential to provide us with a lot of information obtained from quite a large sample of individuals. By employing this study design, this study will focus on obtaining quantitative and qualitative data from the targeted respondents.

3.3 Target Population

The target population of this study was 15 polytechnics that have ICT centers commissioned by the county government which are distributed across the county in the eight sub-counties, namely Kitui Central, Kitui West, Kitui East, Kitui South, Kitui Rural, Mwingi North, Mwingi Central and Mwingi West. The respondents were 2651 which comprised of 10 committee members, 18 county government staff in ICT department, 105 teaching staff and 2518 polytechnic students (Ministry of Education Kitui County, 2016). This population was chosen since they deal with ICT in the polytechnic, they manage the ICT centers and they know the status of the ICT project implementation in these centers.

Table 3.1 Target Population

	Population	Percentage
Committee members	10	1
County Government staff in ICT department	18	1
Teaching staff	105	4
Polytechnic students	2518	94
Total	2651	100

Source: Ministry of Education Kitui County, (2017)

3.4 Sample Size and Sampling Procedures

This section presents the methods and techniques used for sampling, the procedure of sampling and eventually how the final study sample is reached from the target population. The details of how data was obtained processed and analysed.

3.4.1 Sample Size

Sample size is finite part of a statistical population whose properties are studied to gain information about the whole. Sampling is selecting a given number of subjects from a defined population as representative of that population. Any statements made about the sample should also be true of the population. It is however agreed that the larger the sample the smaller the sampling error. Where external validity is important, one need to carry out purposive sampling from properly defined population. The study adopted simple random sampling technique to select the 4 sub-counties within the county namely Kitui West, Kitui Central, Mwingi Central and Kitui East where most of the polytechnic reported to have implemented the ICT projects. According to Ministry of Education Kitui County (2016) out of 15 polytechnic with ICT, 9 of them were within the said four sub-counties. These sub-counties are chosen since it is not possible to collect data in the entire county due to geographical of the area as well as the time required to collect the data. From the 9 ICT centers selected they have a population of 1800 students and 63 teaching staffs. This totals to 1891 including 10 committee members and 18 ICT county government staff. According to Krejcie and Morgan (1970) Table of Sample Size Determination, suggested minimum sample size of 317 from a population of 1891 is adequate for representative. The study sampled 8 committee members, 12 County Government staff in ICT department, 53 Teaching

staff and 244 Polytechnic students. This contributed to a sample size of 317 respondents as proposed by Krejcie and Morgan, 1970 formula.

Table 3.2 Sample Size

Category	Population	Sample
Committee members	10	8
County Government staff in ICT department	18	12
Teaching staff	63	53
Polytechnic students	1800	244
Total	1891	317

Source: Author 2017

3.4.2 Sampling Procedure

The sampling procedure describes the list of all population units from which the sample was selected (Cooper & Schindler, 2003). The technique was applied so as to obtain a representative sample when the population does not constitute a homogeneous group.

In this study, simple random sampling technique was used to select respondents from the various groups of respondents. The groups that formed the sample include committee members, county government staff in ICT department, teaching staff and polytechnic students. The total sample was 317 respondents.

3.5 Research Instruments

The study employed a questionnaire and interview guide to gather primary data. The questionnaire was used to collect data from the selected sample within the polytechnic centers selected. Questionnaires are appropriate for studies since they collect information that is not directly observable as they inquire about feelings, motivations, attitudes, accomplishments as well as experiences of individuals (Mellenbergh, 2008). The questionnaire comprised of both open and close-ended questions. Saunders (2003) stated that a questionnaire is useful in obtaining objective data because participants are not manipulated in any way by the study. According to Saunders (2003) questionnaires have the added advantage of being less costly and using less time as instruments of data collection. The data instrument addressed the four research objectives while it was sub-divided into two sections. The first section of the

questionnaire enquired general information about the respondents, while the second section answered the four objectives. Interview guide was used to collect information from the key informant from county government staff in ICT department, committee members and teaching staff.

3.5.1 Piloting of the Instruments

The questionnaires was reviewed by the researcher's professional peers and the research supervisor and then tested on a small pilot sample of respondents with similar characteristics as the study respondents. The pilot sample consisted of 9 respondents from four polytechnic centers within Kitui County. The pilot group was done through random sampling. Mugenda and Mugenda (2003) suggest that the piloting sample should be 1 to 10% of study sample depending on the study sample size. Piloting helps in revealing questions that could be vague which allows for their review until they convey the same meaning to all the subjects (Mugenda & Mugenda, 2003).

3.5.2 Validity of Instruments

Validity is the quality of a data gathering instrument that enables it to measure what it is supposed to measure. Creswell (2008) notes that validity is about whether one can draw meaningful and useful inferences from scores on the instrument. To ensure content validity, the instruments were reviewed by the research supervisor. Content validity yields a logical judgment as to whether the instrument covers what it is supposed to cover. Content validity ensures that all respondents understand the items on the questionnaire similarly to avoid misunderstanding. Response options were provided for most of the questions to ensure that the answers given are in line with the research questions they are meant to measure.

3.5.3 Reliability of Instruments

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trial. Reliability answers the question "are scores stable over time when the instrument is administered a second time" (Creswell, 2003). To ensure reliability, the researcher used split-half technique to calculate reliability coefficient which should be within the recommended reliability coefficient of 0.7-1 (Nachmias & Nachmias 1996).

3.6 Data Collection Procedure

The first step is to get proposal approval after which a letter of introduction was obtained from The University of Nairobi and thereafter apply and obtain NACOSTI research permit. The researcher contacted the Ministry of Education, Kitui County and informed them of the study to take place within the region. The researcher engaged three research assistants who will assist in data collection from the respondents. The research assistants were taken through a brief to clearly understand the research instruments, purpose of the study and ethics of research. The research assistants visited the sampled polytechnic centers and administer the questionnaires to the respondents face to face. Appointments to the sampled centers were made prior to the visits to avoid any inconveniences to the respondents. The researchers communicated that the information given was specifically for the study and shall be kept confidential and their identities would not be necessary.

3.7 Data Analysis Techniques

Data was cleaned, coded, entered and analyzed using Statistical Package for Social Science (SPSS, Version 21.0). SPSS was used because it is fast and flexible and provides more accurate analysis resulting in dependable conclusions. Data processing implies editing, classification, coding, and tabulation of collected data so that they are amenable to analysis (Kothari, 2007). Data analysis involves computation of certain measures along with searching for patterns of relationships that exist between the dependent variable and independent variables. The data was analyzed according to variables and objectives of the study. Descriptive statistics was used to analyze data. Descriptive analysis involved use of frequency distribution tables and cross tabulation which was used to generate values between dependent and independent variables used in the study. Content analysis was used for the qualitative data from the interview guide and the open ended questions in the questionnaire. In addition, the researcher employed inferential statistics analysis to establish the strength of the relationship between the dependent and independent variables.

3.8 Ethical Considerations

The researcher ensured that ethics were put into consideration during the research process. After consent is given by the National Commission for Science, Technology

and Innovation to collect data, the researcher coordinated data collection process after seeking permission from Kitui County government and department of ICT. There respondents participated in the study voluntarily to ensure privacy and confidentiality. The respondent were informed of the objective of the study and that the data will be used for academic purpose only.

3.9 Operational Definition of Variables

The operationalization of variables is as shown in Table 3.3.

Table 3.3 Operational Definition of Variables

Objectives	Independent Variables	Indicators	Measurement Scale	Type of Analysis	Tools of analysis
To examine how infrastructural facilities influence implementation of Information Communication Technology projects in polytechnic centers in Kitui County.	Infrastructural Facilities	Reliability of electricity	Nominal	Descriptive Multiple regression	Frequency distribution tables. Tabulation & percentages
		No. of available Computers	Nominal		
		Internet availability	Ordinal		
		Computer technologies availability	Nominal		
To examine the influence of stakeholder's participation on implementation of Information Communication Technology projects in polytechnic centers in Kitui County	Stakeholder's Participation	No. of consultative meetings	Ordinal	Descriptive Multiple regression	Frequency distribution tables & percentage
		No. of stakeholders involved	Nominal		
		The speed of decision making	Ordinal		
		Level of stakeholder knowledge and contribution.	Ordinal		

<p>To determine influence of financial resource implementation of Information Communication Technology projects in polytechnic centers in Kitui County</p>	<p>Financial Resource</p>	<p>Amount of fund Disbursed for the project.</p> <p>Price of buying, installing and maintaining computers.</p> <p>Amount required for project</p> <p>Amount required for project</p>	<p>Nominal</p> <p>Nominal</p> <p>Ordinal</p> <p>Ordinal</p>	<p>Descriptive</p> <p>Multiple regression</p>	<p>Frequency distribution tables.</p> <p>Tabulation & percentages</p>
<p>To assess how employees' technical skills influence implementation of Information Communication Technology projects in polytechnic centers in Kitui County</p>	<p>Technical Skills</p>	<p>Level of project team skills</p> <p>Academic/qualification</p> <p>Work experience in project management</p>	<p>Ordinal</p> <p>Nominal</p> <p>Nominal</p>	<p>Descriptive</p> <p>Multiple regression</p>	<p>Frequency distribution tables.</p> <p>Tabulation & percentages</p>
<p>To investigate factors influencing implementation of Information Communication Technology projects</p>	<p>Implementation of Information Communication Technology projects</p>	<p>No. ICT Centers</p> <p>No. of students accessing ICT facilities</p> <p>Level of community involvement</p>	<p>Interval</p> <p>Interval</p> <p>Ordinal</p>	<p>Descriptive</p> <p>Multiple regression</p>	

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter focuses on the interpretation and presentation of the findings. The main purpose of this research was to determine factors influencing implementation of Information Communication Technology projects in Kenya with focus to polytechnic centers in Kitui County. The study also sought to establish whether infrastructural facilities, stakeholder's participation, financial resource and employees' technical skills influence implementation of Information Communication Technology projects in polytechnic centers. The researcher made use of frequency tables, percentages, mean and standard deviation to present the data.

4.2 Response Return Rate

The study sampled 317 respondents from the target population in collecting data on factors influencing implementation of information communication technology projects in Kenya with focus to polytechnic centers in Kitui County. The study targeted committee members, county government staff in ICT department, teaching staff and polytechnic students. The questionnaire return rate results are shown in Table 4.1.

Table 4.1 Response Rate

	Frequency	Percentage
Collected	237	75
Uncollected	80	25
Total	317	100

From the study, out of 317 respondents targeted only 237 fully filled the questionnaire and interview guides contributing to 75% response rate. This response rate was achieved due to data collection procedure that was adopted by the researcher, where the researcher engaged some research assistance to help in distribution of the questionnaires and interview guides to the respondents and made some follow up to ensure the respondents fill the questionnaires and interview guides and give back the

feedback. This response rate is acceptable, Mugenda and Mugenda (1999) pointed that response of 50% is good for analysis, 60% is acceptable response rate while over 70% is extremely good for giving a report. The respondents who did not participate in the interviews were not available at that time of data collection and for others despite persistent follow-ups there were no positive responses from them. The response rate demonstrates a willingness to take part in the study.

4.3 Demographic Characteristics of the Respondents

The study found it crucial to find it important to establish general demographic characteristics of the respondents since this forms the basis to which the respond can establish the authentic of the information. The analysis relied on this information of the respondents so as to categorize the different results according to their acquaintance and responses.

4.3.1 Categories of the Respondents

Table 4.2 indicate the category of the sampled in the research methodology section.

Table 4.2 Categories of the Respondents

	Responde d	Non- response	Percentage of Response rate
Committee members	6	2	3
ICT County Government staff	8	4	3
Teaching staff	41	12	17
Polytechnic students	182	62	77
Total	237	80	100

Out of possible 244 of the polytechnic students only 182 representing 77% of the respondents, 41 out of 53 targeted respondents from the teaching staff contributing to 17% of the total response rate. Further 8 out of 12 targeted County government staff responded to the study contributing to 3% responded and another 3% (6) of the committee members participated in the study. This indicate that there is adequate number of the respondents who participated in the study from the categories targted by the study.

4.3.2 Duration in Polytechnic

Table 4.3 below summarizes the finding of the study on the duration that the respondents have been in polytechnics.

Table 4.3 Duration in Polytechnic

	Frequency	Percentage
1 year	88	48
2-3 Years	94	52
Total	182	100

The study aimed to investigate the duration that the respondents have been in polytechnics for their study. From the findings, 88 (48%) of the respondents have been in the polytechnics for a period of 1 year and 94 (52%) have been in polytechnics for a period of 2-3 years.

4.3.3 Efforts in the Polytechnic in Implementing ICT Project

Table 4.4 below indicate whether there is effort by the management with the organization in implementing ICT project in the institution.

Table 4.4 Efforts in the Polytechnic in Implementing ICT Project

	Frequency	Percentage
Yes	158	87
No	24	13
Total	182	100

From the findings, out of 182 students who participated in the study, 87% (158) pointed that there is effort by the management to ensure ICT project in the institution has been effectively implemented while 13% (24) indicate that there is no effort to implement ICT project in their institution.

4.4 Infrastructural Facilities and ICT Project Implementation

These are infrastructures that entail the provision of physical and technological facilities in schools. The study also aimed to investigate how ICT infrastructure affects implementation of ICT projects. Akunja (2011) observed that lack of ICT

infrastructure has hampered provision of efficient and affordable ICT services in the country.

4.4.1 Availability of Infrastructure Facilities in the Polytechnic

Table 4.5 illustrates the study findings on availability of infrastructure facilities in the polytechnic.

Table 4.5 Availability of Infrastructure Facilities in the Polytechnic

	Frequency		Percentage	
	Yes	No	Yes	No
Electricity connection	172	10	95	5
Internet connection	158	24	87	13
Computer lab	143	39	79	21
Computers	137	45	75	25

Most of the respondents, 172 (95%) indicated that their institution has electricity connection, 158 (87%) indicated that they have internet connection, 143 (79%) indicated that they have computer lab while 137 (75%) indicated that they have computers in their school.

This implies that most of the polytechnics in the county, are striving to ensure that the intended project is fully implemented. Interviewees pointed that polytechnics within the county have adequate infrastructures which are critical in ICT project implementation. Such infrastructure includes connectivity to various networks (internet, intranet, and mobile-telephone); sources and reliability of energy (electricity, standby generators); equipment (computers, radios, videos, television, LCD projectors) and software, e-learning laboratories, and information storage facilities such as flash disk and, DVDs. In addition, the numbers of working computers were adequate in some institutions while others were having few computers which were in operation, availability of file servers and students computer sharing ratio were also mentioned to be major factors influencing ICT project implementation.

4.4.2 ICT Infrastructure and Project Implementation

Table 4.6 indicates their level of agreement on the statement relating to how aspects of ICT infrastructure influence ICT project implementation.

Table 4.6 Influence ICT Infrastructure on Project Implementation

	Mean	STDev
Use of modern ICT hardware and software is paramount to the implementation of ICT projects	3.74	1.041
Our polytechnic is equipped with modern ICT gadgets to enable them access internet fast.	3.66	1.133
Lack of adequate ICT infrastructure has hampered provision of efficient and affordable ICT services	3.71	0.899
Lack of basic infrastructure such as electricity act as barriers to the use of ICT in our institution	4.15	0.009
Our institution is equipped with unique ICT infrastructures and electronics equipment to enhance knowledge dissemination among students within the institutions	3.73	0.87
ICT project is implemented and there exist sufficient resources that support it is implementation such as ICT infrastructure	3.44	0.943
Our institution suffer from lack of ICT infrastructure such internet, electricity forcing teaching staff to operate in uncomfortable environment that does not support ICT projects	3.58	0.712

From the findings, respondents agreed that lack of basic infrastructure such as electricity act as barriers to the use of ICT in their institution as depicted by mean score of 4.15, respondents also agreed that use of modern ICT hardware and software is paramount to the implementation of ICT projects, institution is equipped with unique ICT infrastructures and electronics equipment to enhance knowledge dissemination among students within the institutions and that lack of adequate ICT infrastructure has hampered provision of efficient and affordable ICT services as depicted by mean score of 3.74, 3.73 and 3.71 respectively. Further respondent agreed that their learning institution is equipped with modern ICT gadgets to enable them access internet fast as illustrated by mean score of 3.66. However, respondents agreed that polytechnic institution suffer from lack of ICT infrastructure such internet, electricity forcing teaching staff to operate in uncomfortable environment that does

not support ICT projects as indicated by mean score of 3.58. On other hand respondents were neutral that in their institution ICT project is implemented and there exist sufficient resources that support it is implementation such as ICT infrastructure as illustrated by mean score of 3.44. Interviewee pointed that some of the challenges facing ICT project implementation was caused by the poor Internet connectivity in a number of polytechnics, whereas others lacked Internet connection all together. Furthermore, most schools did not have the required multimedia equipment. In a number of cases, there was no Internet connection and the support provided to the institutions administration as well as from the ICT infrastructure providers (county government) was minimal. Even though most of the infrastructures needed for ICT implementation were in place most institutions, the high cost of maintenance hamper the implementation process. Farrell (2007) argues that high costs for acquisition and maintenance of ICT infrastructure is a challenge that has continued to hamper implementation of ICT projects. Hennessy, (2010) observed that one of the greatest challenges in implementation of ICT projects is balancing project goals with economic realities.

4.4.3 Extent that Infrastructure Facilities influence ICT Project Implementation

Table 4.7 illustrates the findings of the study on the extent that infrastructure facilities influence ICT project implementation.

Table 4.7 Influence of Infrastructure Facilities on ICT Project Implementation

	Frequency	Percentage
Very little extent	11	6
Little extent	18	10
Moderate extent	29	16
Great Extent	86	47
Very great extent	38	21
Total	182	100

Majority 47% (86) of the respondents' indicated that infrastructure facilities influence ICT project implementation to a great extent, 21% (38) to a very great extent, 16% (29) to a moderate extent, 10% (18) to a little extent while 6% (11) pointed that infrastructure facilities influence ICT project implementation to a very little extent.

From the findings, most of the respondents agree that infrastructure facilities have an influence on ICT Project Implementation. According to Hennessy (2010) ICTs do require supporting physical infrastructure to be in place before they can be implemented.

4.5 Stakeholder Participation and ICT Project Implementation

Stakeholders' participation is paramount in development projects. Even though, minor decisions and emergency situations are generally not appropriate for stakeholder participation, a complex situation with far-reaching impacts warrant stakeholder involvement and when done proactively, rather than in response to a problem, helps to avoid problems in the future. Granger and his colleagues (2002) pointed that successful implementation of ICT project requires not only computers but also commitment and shareholders involvement, with the being closely interlinked.

4.5.1 Stakeholder Participation and ICT Project Implementation

Table 4.8 illustrates the finding of the study on the respondent level of agreement to the aspects of stakeholders' participation on ICT project implementation.

Table 4.8 Stakeholder Participation and ICT Project Implementation

	Mean	STDe v
An institution is moving to student centered use of ICT through links with local community	3.52	1.168
Successful ICT project implementation requires not only computers but also commitment from the community	3.77	0.297
Our institution use the introduction of laptops to build up a 'connected learning community' in an area of lack of social and economic context	3.70	1.198
Community plays a role in ICT integration through encouraging the young to be involved in the life of the community	4.01	0.196
Stakeholders participation upholds and transmits the right values and attitudes to the young as far as the dangers of the newly adopted ICT	3.64	1.284

From the findings, most of the respondent agreed that community plays a role in ICT integration through encouraging the young to be involved in the life of the community and elevate the ICT levels of the community as indicated by a mean of 4.01,

respondents also agreed that successful ICT project implementation requires not only computers but also commitment from the community as depicted by mean of 3.77, institution use the introduction of laptops to build up a 'connected learning community' in an area of lack of social and economic context as illustrated by mean of 3.70, respondents also agreed that stakeholders participation upholds and transmits the right values and attitudes to the young as far as the dangers of the newly adopted ICT as shown by mean score of 3.64, lastly respondents agreed that institution is moving to student centered use of ICT through links with the wider community which should be redesigned to allow all interested community members to play an appropriate role as depicted by mean score of 3.52. Interviewee pointed county government has initiated programmes that are aimed to empower ICT teachers to equip the teachers with relevant skills on ICT which is well planned. Committee member have interest, committed and champion the implementation of the projects. The county government has also partnered with private sector and other stakeholders in the process of implementing ICT project that was pioneered by the previous regime. Further, the Ministry of Education has been conducting in-service courses to equip tutors and school committee members with necessary ICT skills that intended to benefit the community.

4.5.2 Extent that Stakeholder Participation Influence ICT Project Implementation

Table 4.9 shows results of the findings on the extent to which stakeholder participation influence ICT project implementation.

Table 4.9 Stakeholder Participation and ICT Project Implementation

	Frequency	Percentage
very little extent	7	4
Little extent	13	7
moderate extent	33	18
great extent	84	46
very great extent	45	25
Total	182	100

84 (46%) respondents pointed that to a great extent stakeholder participation influence ICT project implementation, 45 (25%) indicated to a very great extent, 33 (18%) to a moderate extent, 13 (7%) to a little extent while 7 (4%) to a very little extent.

The findings show that most of the respondents were of the opinion that stakeholder participation influenced ICT Project Implementation to a great extent.

4.6 Financial Resource and ICT Project Implementation

UN report (2010) pointed that lack of financial resources for projects in both developed and less developed countries is not the only challenge facing projects implementation but the main challenge lies on how the people involved in handling these finances are at the capacity of managing the little finances for the effective accomplishment of the intended projects. As such the researcher aimed to determine if financial resources influence implementation of ICT projects in polytechnics in Kenya.

4.6.1 Financial Resource and ICT Project Implementation

Table 4.10 illustrates the findings of the study on the influence of financial resource on ICT project implementation.

Table 4.10 Influence of Financial Resource on ICT Project Implementation

	Mean	STDev
Maintenance cost form a key factor to the successful implementation and integration of ICT projects	4.58	0.23
Cost of ICT materials is a major problems that could negatively influence the implementation of ICT	3.96	0.74
ICT and lack of computers and software in the organization can limit what organization are able to do with ICT	3.94	0.73
Main obstacle to ICT project implementation in schools is the high cost of computer peripherals	3.54	0.87
High cost of hardware and software applications is one of the problems hindering integration of ICT	4.69	0.3
Successful use of ICT project implementation is hampered by high cost of ICT infrastructures	4.08	0.91
Apart from the basic computers themselves, other costs associated with peripherals such as printers, monitors, projectors, modem, and extra disk drives is beyond the reach of our institutions	4.19	0.80
The cost of ICT training materials is high, ICT implementation in institutions of higher learning tend to be minimal and vice versa	3.64	0.284

From the findings, most of the respondents strongly agreed that high cost of hardware and software applications is one of the problems hindering integration of ICT as indicated by the mean score of 4.69. Maintenance cost form a key factor to the successful implementation and integration of ICT projects as shown by mean score of 4.58. Further respondents strongly agreed that apart from the basic computers themselves, other costs associated with peripherals such as printers, monitors, projectors, modem, and extra disk drives is beyond the reach of our institutions as shown by mean score of 4.19. Successful use of ICT project implementation is hampered by high cost of ICT infrastructures as illustrated by mean score of 4.08. Respondents also agreed that cost of ICT materials is major problems that could negatively affect the implementation of ICT and that ICT and lack of computers and software in the organization can limit what organization are able to do with ICT as indicated by mean score of 3.96 and 3.94 respectively. High cost of computer peripherals is the main obstacle to ICT project implementation in most polytechnics as depicted by mean score of 3.54.

4.6.2 Extent that Financial Resource Influence ICT Project Implementation

The researcher further requested respondents to indicate the extent that financial resource influence ICT project implementation.

Table 4.11 Extent that Financial Resource Influence ICT Project Implementation

	Frequency	Percentage
Little extent	16	9
Moderate extent	27	15
Great extent	88	48
Very great extent	51	28
Total	182	100

From the findings, 88 (48%) respondents indicated that financial resource influence ICT project implementation to a great extent, 51 (28%) to a very great extent, 27 (15%) to a moderate extent, while 16 (9%) to a little extent.

This indicate that majority of the respondents were of the opinion that financial resource influence ICT project implementation.

4.7 Employees Technical Skills and ICT Project Implementation

In this section the study sought to determine the influence of employees’ technical skills on the implementation of ICT project. The findings are presented in the subsequent sections. Murch (2001) suggested that project team should possess sufficient technical knowledge and skill to perform their jobs. Technical skills enhance the ability of the project manager to lead and manage through an understanding of the complex issues that persist during a project life cycle.

4.7.1 Employees’ Technical Skills and ICT Project Implementation

Table 4.12 illustrates the findings of the study on influence of financial resource on ICT project implementation.

Table 4.12 Influence of Financial Resource on ICT Project Implementation

	Mean	STDev
The scarcity of adequately trained and experienced analysts, software engineers, systems and network managers, restrains ICT implementation	4.23	0.67
The problems of ICT implementation on lack of technical personnel is a major factor in ICT implementation	3.97	0.61
Laboratory coordinators in our institutions are not skilled enough in resolving technical problems	3.56	0.93
High cost associated with vigorous training in order to become a computer knowledgeable individual hamper ICT project implementation process	3.91	0.04
Lack of training and skills is an obstacle to ICT use in institutions of higher learning	4.42	0.49
Knowledge creation and the ability to translate ICT skills and knowledge to the benefit of society are critical	3.53	0.45
ICT skills are required for empowerment to enhance value and create opportunity through new technologies	3.50	1.01
Low levels of skills and the need to train users influenced ICT implementation	3.67	1.31

From the findings, respondents agreed that lack of training and skills is an obstacle to ICT use in institutions of higher learning and that ICT skills are required for

empowerment to enhance value and create opportunity through new technologies as indicated by the mean score of 4.42 and 4.29 respectively. The scarcity of adequately trained and experienced analysts, software engineers, systems and network managers, restrains ICT implementation as depicted by mean score of 4.23. The problems of ICT implementation on lack of technical personnel and high cost associated with vigorous training in order to become a computer knowledgeable individual hamper ICT project implementation process as shown by mean score of 3.97 and 3.91 respectively. Low levels of skills and the need to train users influenced ICT implementation and laboratory coordinators in some institutions are not skilled enough in resolving technical problems hence hampering the knowledge dissemination to the student who are main beneficiary of the project as shown by mean score of 3.69 and 3.56 respectively. Knowledge creation and the ability to translate ICT skills and knowledge to the benefit of society are critical as revealed by mean score of 3.53. Interviewee pointed despite the effort to fully implement the ICT project technical ICT skills was inadequate in most institutions. Even in institution where teachers had received some ICT training, not much time was allocated for the teachers to apply and implement the ICT skills they had gained into this ICT project. Further interviewee purported that the ICT project pioneered by the county government has had a limited impact teaching practices. This is mainly because teachers in these schools did not have time outside their normal working schedules and the necessary technical skills to repair non-functional computers were not used at all. This makes the programs to experience myriad challenge due to lack of required technical skills in the institutions.

4.7.2 Employees' Technical Skills Influence ICT Project Implementation

Table 4.13 summarizes result of the finding on the extent to employees' technical skills influence ICT project implementation.

Table 4.13 Employees' Technical Skills Influence ICT Project Implementation

	Frequency	Percentage
Little extent	11	6
moderate extent	34	19
great extent	93	51
very great extent	44	24
Total	182	100

From the findings, 93 (51%) respondents pointed that employee's technical skills influence ICT Project implementation to a great extent, 44 (24%) to a very great extent, 34 (19%) to a moderate extent while 11 (6%) to a little extent.

This indicate that majority of the respondents agree to a great extent that employees' technical skills influence ICT Project implementation.

4.8 Implementation of Information and Communication Technology Projects

In Kenya most of public funded projects fail or are never completed due to various reasons. Al-Harbi (2014) argued that if government and other agencies are determined to make this process effective they can solve these challenges to ensure they are success factors that contribute to effective implementation of the ICT projects.

4.8.1 Number of ICT centers

Table 4.14 shows the finding of the study on the number of ICT centers available in the polytechnic.

Table 4.14 Number of ICT centers

	Frequency	Percentage
1 only	131	72
2 to 3	51	28
Total	182	100

From the findings, 131 (72%) respondents indicated that they have only 1 ICT center while 51 (28%) respondents indicated that they have 2 to 3 ICT centers.

This indicate that most of the polytechnics have only one ICT center.

4.8.2 ICT Courses are taught in Polytechnic

The study also sought to investigate the number of ICT courses offered in polytechnics within Kitui County.

Table 4.15 ICT Courses are taught in Polytechnic

	Frequency	Percentage
1 only	24	13
2 to 3	39	21
4 to 5	87	48
More than 5	32	18
Total	182	100

From the findings, 87 (48%) respondents indicated that there are at least 4-5 ICT courses offered in the polytechnic, 39 (21%) pointed that in their polytechnic there are 2-3 ICT courses offered, 32 (18%) indicated that at least more than 5 courses are offered there while 24 (13%) indicated that in their polytechnic there is only one ICT related course offered. Some of the ICT courses offered includes; computer packages, certificate in information systems & technology, certificate in computer repair & maintenance, diploma in information technology(information technology), diploma in printing technology(printing technology) and diploma in secretarial studies(secretarial studies).

Based on the findings, majority of the polytechnics offer 4 to 5 ICT courses.

4.8.3 Number Students Enrolled in ICT Classes

Table 4.16 indicates the number of students enrolled in ICT classes in polytechnics in Kitui County.

Table 4.16 Number Students Enrolled in ICT Classes

	Frequency	Percentage
Less than 10	24	13
11 to 30	39	21
31 to 40	87	48
More than 50	32	18
Total	182	100

From the findings, 87 (48%) respondents pointed that there were 31 to 40 students who have enrolled in ICT courses, 39 (21%) pointed that there were 11 to 30 students enrolled for the ICT courses, 32 (18%) had more than 50 while 24 (13%) had less than 10.

Based on the findings, majority of the ICT classes had enrolled 31 to 40 students.

4.8.4 Number of Members Involved in ICT Projects Implementation

The study further aimed to determine the number of local members involved in ICT projects implementation process.

Table 4.17 Number of Local Members Involved in ICT Projects Implementation

	Frequency	Percentage
Less than 10	15	8
11 to 30	39	21
31 to 40	51	28
More than 50	77	42
Total	182	100

Most of the respondents 77(42%) indicated that more than 50 locals are involved in the projects implementation process, 51 (28%) indicated that 31-40 local are involved in the project, 39 (21%) pointed that 11-30 local are involved while 15 (8%) indicated that less than 10 local are involved.

4.8.5 Resources Allocation

The study further aimed to investigate whether there are enough resources allocated for the project implementation.

Table 4.18 Resources Allocation

	Frequency	Percent
Yes	98	54
No	84	46
Total	182	100

Most of the respondents 98 (54%) indicated that there is enough resources allocated for the project implementation while 84 (46%) pointed that the resources allocated are not enough.

4.8.6 Achievement of Objectives Intended by ICT Project

Table 4.19 Indicates the perception of the respondent on how they perceive the achievement of the ICT projects implemented in the institutions.

Table 4.19 Achievement of Objectives Intended by ICT Project

	Frequency	Percent
Yes	84	46
No	98	54
Total	182	100

From the findings, 98 (54%) respondents indicated that the objectives intended by the ICT project implementation have not been achieved while 84 (46%) felt that the objectives have been achieved.

Majority of the respondents were of the opinion that ICT project had not achieved the intended objectives.

4.8.7 Completion of the Project within the Timeline Set

The study further aimed to investigate whether the ICT projects were completed within the timeline intended to.

Table 4.20 Completion of the Project within the Timeline Set

	Frequency	Percent
Yes	74	41%
No	108	59%
Total	182	100%

From the findings, majority of the respondents, 108 (59%) indicated that the projects were not completed within the set timeline while 74 (41%) indicated that the projects were completed within the timeline.

4.9 Inferential Statistic

To establish the relationship between the independent variables and the dependent variable the study conducted inferential analysis which involved coefficient of correlation, coefficient of determination and multiple regression analysis.

4.9.1 Coefficient of Correlation

In an attempt to show the relationship between the study variables and their findings the study used the Karl Pearson's coefficient of correlation (r).

Table 4.21 Coefficient of Correlation

Variables			ICT project Implementation	ICT infrastructures	Stakeholder Participation	Financial Resources	Technical Skills
ICT project Implementation	Pearson Correlation Sig. (2-tailed)		1				
ICT infrastructures	Pearson Correlation Sig. (2-tailed)		0.5243	1			
Stakeholder participation	Pearson Correlation Sig. (2-tailed)		0.5127	0.3421	1		
Financial resources	Pearson Correlation Sig. (2-tailed)		0.6210	0.1240	0.0621	1	
Technical Skills	Pearson Correlation Sig. (2-tailed)		0.5030	0.3420	0.0125	0.1660	1
			0.0172	0.0031	0.0423	0.0031	

According to the findings as indicated in Table 4.21, it was clear that there was a positive correlation between ICT infrastructures and ICT project Implementation as depicted by a correlation value of 0. 5243. The study also revealed that there is a positive correlation between stakeholder participation and ICT project implementation

with a correlation value of 0. 5127. It was clear that there was positive correlation between financial resources and ICT project implementation with a correlation value of 0.6210 and a positive correlation between technical skills and ICT project implementation with a correlation value of 0.5030. This shows that there was a positive correlation between ICT infrastructures, stakeholder participation, financial resources and employee technical skills.

4.9.2 Coefficient of Determination

The coefficient of determination was carried out to measure how well the statistical model was likely to predict future outcomes.

Table 4.22 Model Summary

Model	R	r ²	Adjusted r ²	Std. Error of the Estimate
1	0.742	0.551	0.641	0.0438

The coefficient of determination, (r^2) is the square of the sample correlation coefficient between outcomes and predicted values. As such it explains the contribution of the four independent variables (ICT infrastructures, stakeholder participation, financial resources and employee technical skills) to the dependent variable. Of the four independent variables that were studied, they contribute 55.1% to ICT project implementation as represented by the adjusted (r^2) as shown on Table 4.22. This means that other factors that were not studied in this study contribute to 44.9% on ICT project implementation.

4.9.3 Multiple Regression

The researcher further conducted a multiple regression analysis so as to identify the factors influencing ICT project implementation. The main purpose of multiple regressions is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable. The researcher used SPSS to enter, and code response from the respondent to assist in computing the extent to which a unit changes in a given independent variable to dependent variable.

Table 4.23 Regression Coefficients

Model	Unstandardized		Standardize	t	Sig.
	Coefficients		d		
	β	Std. Error	Beta		
Constant/Y Intercept	1.279	1.316		1.451	0.357
ICT infrastructures	0.531	0.310	0.172	4.242	0.0276
Stakeholder participation	0.525	0.322	0.067	3.452	0.0202
Financial Resources	0.613	0.156	0.210	3.382	0.0285
Technical Skills	0.510	0.245	0.148	3.358	0.0249

As per the SPSS generated Table 4.23, the equation

$(Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon)$ becomes:

$$Y = 1.279 + 0.531 X_1 + 0.525 X_2 + 0.613 X_3 + 0.510 X_4$$

The regression equation above has established that taking all factors into account (ICT infrastructures, stakeholder participation, financial resources and employee technical skills) constant at zero, ICT project implementation will be 1.279. The findings reveals that assuming other variables are at zero a unit change (increase) in ICT infrastructures will lead to a 0.531 increase ICT project implementation; a unit increase in stakeholder participation will lead to a 0.525 increase ICT project implementation; a unit increase in Financial Resources will lead to a 0.613 increase ICT project implementation and a unit increase in technical skills will lead to a 0.510 increase ICT project implementation as shown in Table 4.23. This infers that financial resources influences ICT project implementation to a great extent followed by ICT infrastructures then Stakeholder participation while technical Skills influence to a little extent to ICT project implementation.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives summary of the findings, discussion of the study findings and conclusion of the research; recommendations as well as providing general suggestion areas that need further research.

5.2 Summary of the Findings

The study aimed to investigate influence of infrastructural facilities, stakeholder's participation, financial resource and employees' technical skills on implementation of ICT projects in polytechnic centers within Kitui County.

From the study, at least 75% of the respondents indicated that polytechnics have electricity, internet connection, computer labs and computers in their school which are critical in ICT project implementation. Some of the infrastructure available includes; connectivity to various networks (internet, intranet, and mobile-telephone); reliability source of energy (electricity, standby generators); ICT equipment (computers, videos, television, LCD projectors and software and information storage facilities such as flash disks, CD-ROMs, DVDs). However, some polytechnics were having few numbers of computers while other were having faulty computer, with students computer ratio being small which hampered the implementation of ICT project. The study also established that lack of basic infrastructure such as electricity act as barriers to the implementation of ICT project in most polytechnic. Use of modern ICT hardware and software is paramount to the implementation of ICT projects where polytechnics need to be equipped with unique ICT infrastructures and electronics equipment to enhance knowledge dissemination to the students and the locals. This effort is hampered by the lack of adequate ICT infrastructure that hinder provision of efficient and affordable ICT services in the institutions which influence ICT project implementation to a great extent.

To the influence of stakeholder participation on ICT Project Implementation, the study established that community plays a role in ICT integration through encouraging

the young to be involved in the life of the community as shown by a mean of 4.01. This aids in elevating the ICT literacy levels in the community. Commitment of the society or community is key in ICT implementation, misinterpretation of availability of computer should not be regarded as effective ICT implementation. Polytechnics in the county are using the introduction of ICT projects to build up a connected learning community in an area where lack of social and economic context was not a priority. Stakeholders' participation in ICT project implementation upholds and transmits the right values and attitudes to the young as far as the dangers of the newly adopted ICT. However, the study found that even though ICT project is moving to student centered use of ICT through links with the wider community it should be redesigned to allow all interested community members to play an appropriate role towards its implementation. To ensure effective and smooth implementation of ICT projects through stakeholder participation, there have been professional development of teachers through in-service courses. These courses are offered by the county government to equip the teachers with relevant skills on ICT which is well planned.

On influence of financial resource on ICT project implementation, the study established that high cost of hardware and software applications was the leading problem hindering integration of ICT with a mean of 4.69 followed by maintenance cost with a mean of 4.58. In most polytechnics, they cannot afford other associated cost such as cost of printers, monitors, projectors, modem, and extra disk drives which is beyond the reach of the institutions. Successful use of ICT project implementation is hampered by high cost of ICT infrastructures. Cost of ICT materials is major problem that could negatively influence the implementation of ICT and that lack of computers and software in the organization can limit what organization are able to do with ICT to a great extent.

To the influence of technical skills on ICT project implementation the study revealed lack of training and skills to be an obstacle to implementation of ICT projects in polytechnics leading with a mean of 4.42. This challenge is manifested where the skills need in the implementation process lacks in most of the polytechnics. The scarcity of adequately trained and experienced analysts, software engineers, systems and network managers was noted to restrain ICT implementation with a mean of 4.23.

The other key challenges of ICT implementation noted were lack of technical personnel and high cost associated with vigorous training in order to become a computer knowledgeable individual. In addition, laboratory coordinators in some institutions are not skilled enough in resolving technical problems hence hampering the knowledge dissemination to the student who are main beneficiary of the project. Despite the effort to fully implement the ICT project, technical skills are inadequate in most polytechnics. Even in institution where teachers had received some ICT training, not much time was allocated for the teachers to apply and implement the ICT skills they had gained into this ICT project

5.3 Discussion of the Findings

The study sought to establish influence of infrastructural facilities on implementation of Information Communication Technology projects in polytechnic centers in Kitui County, examine the influence of stakeholder's participation on implementation of Information Communication Technology projects in polytechnic centers in Kitui County, determine influence of financial resource implementation of Information Communication Technology projects in polytechnic centers in Kitui County and to assess how employees' technical skills influence implementation of Information Communication Technology projects in polytechnic centers in Kitui County.

To the influence of ICT infrastructural facilities, the study found that most polytechnics have electricity and internet connection, computer lab and have computers in their school which are critical in ICT project implementation. According to Laaria (2013) successful implementation of ICT requires that institution acquiring the needed infrastructures that support implementation process. Some polytechnics were having few numbers of computers while other were having fault computer, with students computer ratio being small which hampered the implementation of ICT project. Lack of basic infrastructures such as electricity, internet among others act as barriers to the implementation of ICT project in most polytechnics. Hennessy (2010) indicated that ICTs projects do require supporting physical infrastructure to be in place before they can be implemented. Lack of adequate ICT infrastructure hinders provision of efficient and affordable ICT services in the institutions which influence ICT project implementation to a great extent. The finding conforms to Aguyo (2010)

that limited resources to equip institutions with ICT infrastructure acts as a barrier in implementation of ICT projects. Further Aguyo pointed that lack of essential infrastructures such as electricity, internet serious impediment to the implementation of ICT projects. Any plans to implement ICT projects in learning institutions should include a careful consideration of alternative power sources or power backup sources which mostly are expensive for schools.

On the influence of stakeholder participation on ICT Project Implementation, the study established that community plays a role in ICT integration through encouraging the young to be involved in the life of the community and elevate the ICT literacy levels in the community. Laaria (2013) purported that there is need for partnership between the government and the community to ensure effective implementation of projects that is intended to benefit the society. This partnership will make the process of project implementation easy. Stakeholder participation is critical in ICT implementation of ICT project and misunderstanding computer availability should not be considers as the ICT project implementation is effective or is taking shape. There is need to redesigned the project implementation process to allow all interested stakeholders to play an appropriate role towards its implementation. Nchunge *at el.* (2012) pointed that the schools that were supplied with computers which were intended to support ICT application could not adopt the ICT readily because of factors that came from both the central government through the ministry of education, the teachers, the students and other stakeholders like the religious organizations. Those that touched on the teachers included: lack of ICT knowledge and skills, poor teachers' attitude and perception towards their students and ICT projects at large, poor administration practices in schools and many more.

Further the study found that there is effort in most polytechnic through partnership with the county government where staffs are empowered through offering professional development to tutors via in-service courses. Stakeholder participation is critical to the success of every project in every organization (Harold, 2010). Cleland and Ireland (2012) suggested that in a project environment, stakeholders are usually numerous, and can vary significantly in the degree of influence. Stakeholder Involvement can take place in different parts of the project cycle and at different

levels of society, and take many different forms. Stakeholders have power to influence the project implementation either by making it successful or failure (Norrel, 2012).

To the influence of financial resource on ICT project implementation, the study established that high cost of hardware and software applications is one of the problems hindering integration of ICT. Makau (2012) established that financial resources form a key factor to the successful implementation of ICT projects in higher education in Kenya. Maintenance cost is a key factor on the successful implementation and integration of ICT projects. Other cost associated with ICT project implementation such as cost internet installation, monitors, projectors, is beyond the reach of most institutions thus hindering project implementation. Mumtaz (2011) reported limited financial resources in most learning institutions is a great impediment to the implementation of ICT and lack of computers and software in the classroom limit what teachers are able to do with ICT. Cost of ICT materials is major problems and limits what organization is able to do with ICT. Magambo (2007) established that high cost of hardware and software applications, as one of the problems hindering implementation of ICT in universities in Africa.

On the influence of technical skills on ICT project implementation, the study found that lack of training and skills is an obstacle to implementation of ICT projects in polytechnics. These challenges are portrayed in most polytechnics where the skills needed in the implementation process are not readily available. The scarcity of adequately trained and experienced analysts, software engineers, systems and network managers, restrains ICT implementation. Kasozi (2011) indicated that there are still many problems facing ICT spread in the education sector. He highlighted the problems as initial capital being prohibitive and lack of technical personnel. The problems of ICT implementation on lack of technical personnel and high cost associated with vigorous training in order to become a computer knowledgeable individual hamper ICT project implementation process. Laboratory coordinators in some institutions are not skilled enough in resolving technical problems hence hampering the knowledge dissemination to the student who are main beneficiary of the project. Aryatuha (2007) also pointed that most of the African economies are so

poor and where ICT is introduced the competency to handle it is very low since the capacity to train staff is limited because of lack of enough resources. Despite the effort to fully implement the ICT project technical skills are inadequate in most institutions. The lack of technical skills of maintaining the functionality of computers confused teachers to integrate ICT in the classroom. In cases where teachers had received some ICT training, not much time was allocated for the teachers to apply it. The study finding Oloo (2009) the rate of teachers' adoption and integration has continued to slow down each day due to factors such as inadequate ICT training, lack of ample time due to fully packed schedules, poor administrators' support of ICT and many more.

5.4 Conclusions

The study aimed to establish the influence factors influencing implementation of Information Communication Technology projects in Kenya with focus to polytechnic centers in Kitui County. From the study findings, the study concludes that most polytechnics have electricity and internet connection, computer lab and have computers which are critical in ICT project implementation. However, some polytechnics were having few numbers of computers while other were having faulty computers and students computer ratio being small which hampered the implementation of ICT project in most polytechnics.

To stakeholder participation on ICT Project Implementation, the study concluded that community plays a role in ICT integration through encouraging the young to be involved in the life of the community and elevate the ICT literacy levels in the community. There is need to redesign the project implementation process to allow all interested stakeholders to play an appropriate role towards its implementation. The study concluded that there is effort in most polytechnic through partnership with the county government where staffs are empowered through offering professional development to tutors via in-service courses.

On influence of financial resource on ICT project implementation, the study concluded that high cost of hardware and software applications is one of the problems hindering implementation of ICT project. Maintenance cost is a key factor on the successful implementation and integration of ICT projects. Other cost associated with

ICT project implementation such as cost internet installation, monitors, projectors, is beyond the reach of most institutions thus hindering project implementation.

To how technical skills influence ICT project implementation, the study concluded that lack of training and skills are an obstacle to implementation of ICT projects in polytechnics. These challenges are portrayed in most polytechnics where the skills needed in the implementation process are not readily available. The scarcity of adequately trained and experienced analysts, software engineers, systems and network managers, restrains ICT implementation. Laboratory coordinators in some institutions are not skilled enough in resolving technical problems hence hampering the knowledge dissemination to the student who are main beneficiary of the project. Despite the effort to fully implement the ICT project technical skills are inadequate in most institutions. The lack of technical skills of maintaining the functionality of computers confused teachers to integrate ICT in the classroom. In cases where teachers had received some ICT training, not much time was allocated for the teachers to apply it.

5.5 Recommendations

The following recommendations were made based on study findings.

To the influence of ICT infrastructures, the study recommends that the institution should plan for the installation of ICT infrastructure as well as envisioning the need for regular training of teachers in ICT as a staff development program. The government should ensure that the availability of ICT infrastructure such electricity is in place during ICT project implementation more so in remote and rural areas. The government should embark on equipping learning institutions with the necessary ICT infrastructure before the process of full scale implementation of ICT project commences. Specifically the government should ensure that all the polytechnics are provided with electricity power supply, connected to internet services and equipped with adequate and up-to-date computers laboratories for such kind of ICT to be effective implemented.

On stakeholders' participation on ICT project implementation, the study recommends that apart from lobbying stakeholders support and waiting for their contributions, county government, polytechnic committee members and management should

prioritize on ICT project implementation through allocating enough funds for its implementation. They should consider applying basic ICT skills in management of their schools. Refresher courses should be arranged regularly for school managers in order to update them with new development in ICT and education in general. The study also recommends that by being role model in ICT use, visionary, planners and custodian of ICT infrastructure, school leaders should be committed, champion and have interest in the implementation of ICT projects in polytechnics. They should lead transformation of the school through being passionate, active and enthusiastic.

On financial resources, the study recommends that government should increase their financial allocations to ICT projects implementation so that learning institutions such as polytechnic can have enough money to finance these projects. The government through Ministry of Education officials should also genuinely monitor and evaluate school projects so as to ensure compliance with the standards and within the budget estimated. The board of management must apply sound financial management not only for big projects but also in small scale purchases; failure to which they will face crisis from different players in financing such projects.

The study concluded that staff technical skills has effect on the implementation of project management in that necessary skills play a key role in execution of duties by the employees. In order to address these requirements effectively, schools need to make a decision on the following: outsource some of the services e.g. technical personnel, share competent ICT staff with schools within the locality and combine certain roles, e.g. technical support staff could also perform training of users. The effective implementation of ICT programmes in schools will require that teachers acquire basic ICT technical training skills to enable them operate the computer networks. Johnson and Eisenberg (1996) points out that in most schools, ICT technical skills were taught as isolated subjects and limited to students in choosing ICT related courses.

5.6 Suggestions for Further Studies

A research should be conducted to investigate the other factors not under the study but which also influence implementation of government related projects. Further studies should be done on the factors influencing performance of projects in other sectors

other than education sector. A study should also be done on the factors influencing performance of other projects funded by the government for example road construction projects to indicate whether the same factors influence other projects funded by the government.

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APPENDICES

APPENDIX I: TRANSMITTAL LETTER

Judith Kalondu
Benjamin

P.O. Box 35171 -
00200

Nairobi.

Date 18/1/2018

Dear Sir/Madam

RE: FACTORS INFLUENCING IMPLEMENTATION OF INFORMATION COMMUNICATION TECHNOLOGY PROJECTS IN KENYA: A CASE OF POLYTECHNIC CENTRES IN KITUI COUNTY

I am a Master of Arts student at the University of Nairobi and in my final year of study. As part of the requirement for the award of the degree of Master of Arts in Project Planning and Management, I'm undertaking a research project on "**Factors Influencing Implementation of Information Communication Technology Projects in Kenya: A Case of Polytechnic Centers in Kitui County**". In this regard, I'm kindly requesting for your support in terms of time and by responding to the attached questionnaire. Your accuracy and candid response will be critical in ensuring objective research.

It will not be necessary to write your name on this questionnaire and for your comfort, all information received will be treated in strict confidence. In addition, the findings of the study will surely be used for academic research purposes and to enhance knowledge in maternal health care service.

Thank you for your valuable time on this.

Yours faithfully

Judith Kalondu Benjamin

L50/79725/2015

University of Nairobi

APPENDIX II: RESEARCH QUESTIONNAIRE

Factors Influencing Implementation of Information Communication Technology Projects in Kenya: A Case Of Polytechnic Centers in Kitui County.

INSTRUCTIONS.

Kindly and humbly answer all the questions to the best of your knowledge. Indicate with a tick or filling in the space(s) provided.

SECTION A: GENERAL INFORMATION

1. Name the polytechnic.

.....

2. How long have you been in this polytechnic center?

.....

3. Is there any effort realized in this polytechnic in implementing ICT project?

Yes [] No []

Part B: Infrastructural Facilities

4. Does your school have the following facilities?

	Yes	No
Electricity connection		
Internet connection		
Computer lab		
Computers		

5. Kindly indicate your level of agreement with the following statements relating to how aspects of ICT infrastructure influence ICT project implementation. Use a scale of 1-5, where 1- strongly disagree, 2- disagree, 3- neutral, 4- agree, 5- strongly agree

Infrastructural Facilities	1	2	3	4	5
Use of modern ICT hardware and software is paramount to the implementation of ICT projects					
Our polytechnic is equipped with modern ICT gadgets to enable them access internet fast.					
Lack of adequate ICT infrastructure has hampered provision of efficient and affordable ICT services					
Lack of basic infrastructure such as electricity act as barriers to the use of ICT in our institution					
Our institution is equipped with unique ICT infrastructures and electronics equipment to enhance knowledge dissemination among students within the institutions					
ICT project is implemented and there exist sufficient resources that support it is implementation such as ICT infrastructure					
Our institution suffer from lack of ICT infrastructure such internet, electricity forcing teaching staff to operate in uncomfortable environment that does not support ICT projects					

6. To what extent do infrastructure facilities influence ICT project implementation in your organization?

To a very small extent [] To a small extent []

To a moderate extent [] To a great extent []

To a very great extent []

7. What would you suggest to be done to ensure that infrastructural facilities enhance effective implementation of ICT projects in higher learning institutions in Kenya?

.....
.....
.....
.....

Part C: Stakeholder Participation

8. Kindly indicate your level of agreement with the following statements relating to how aspects of stakeholder participation influence ICT project implementation. Use a scale of 1-5, where 1- strongly disagree, 2- disagree, 3- neutral, 4- agree, 5- strongly agree

	1	2	3	4	5
An institution is moving to student centered use of ICT through links with the wider community which should be redesigned to allow all interested community members to play an appropriate role					
Successful ICT project implementation requires not only computers but also commitment from the community					
Our institution use the introduction of laptops to build up a 'connected learning community' in an area of lack of social and economic context					
Community plays a role in ICT integration through encouraging the young to be involved in the life of the community and elevate the ICT levels of the community					
Stakeholders participation upholds and transmits the right values and attitudes to the young as far as the dangers of the newly adopted ICT is					

9. To what extent does stakeholder participation influence ICT project implementation in your institution?

To a very small extent [] To a small extent []
 To a moderate extent [] To a great extent []
 To a very great extent []

10. What would you suggest to be done to ensure that stakeholder participation enhance effective implementation of ICT projects in higher learning institutions in Kenya?

.....

Part D: Financial Resource

11. Kindly indicate your level of agreement with the following statements relating to how aspects of financial resource and its influence on ICT project implementation. Use a scale of 1-5, where 1- strongly disagree, 2- disagree, 3- neutral, 4- agree, 5- strongly agree

	1	2	3	4	5
Maintenance cost form a key factor to the successful implementation and integration of ICT projects					
Cost of ICT materials is a major problems that could negatively influence the implementation of ICT					
ICT and lack of computers and software in the organization can limit what organization are able to do with ICT					
Main obstacle to ICT project implementation in schools is the high cost of computer peripherals					
High cost of hardware and software applications is one of the problems hindering integration of ICT					
Successful use of ICT project implementation is hampered by high cost of ICT infrastructures					
Apart from the basic computers themselves, other costs associated with peripherals such as printers, monitors, projectors, modem, and extra disk drives is beyond the reach of our institutions					
The cost of ICT training materials is high, ICT implementation in institutions of higher learning tend to be minimal and vice versa					

12. To what extent does financial resource influence ICT project implementation in your organization?

- To a very small extent [] To a small extent []
 To a moderate extent [] To a great extent []
 To a very great extent []

13. What would you suggest to be done to ensure that financial resource enhance effective implementation of ICT projects in higher learning institutions in Kenya?

.....

Part E: Employees' Technical Skills

14. Kindly indicate your level of agreement with the following statements relating to how aspects of financial resource and its influence on ICT project implementation. Use a scale of 1-5, where 1- strongly disagree, 2- disagree, 3- neutral, 4- agree, 5- strongly agree

	1	2	3	4	5
The scarcity of adequately trained and experienced analysts, software engineers, systems and network managers, restrains ICT implementation					
The problems of ICT implementation on lack of technical personnel is a major factor in ICT implementation					
Laboratory coordinators in our institutions are not skilled enough in resolving technical problems					
High cost associated with vigorous training in order to become a computer knowledgeable individual hamper ICT project implementation process					
Lack of training and skills is an obstacle to ICT use in institutions of higher learning					
Knowledge creation and the ability to translate ICT skills and knowledge to the benefit of society are critical					
ICT skills are required for empowerment to enhance value and create opportunity through new technologies					
Low levels of skills and the need to train users influenced ICT implementation					

15. To what extent do employees' technical skills influence ICT project implementation in your organization?

- To a very small extent [] To a small extent []
 To a moderate extent [] To a great extent []
 To a very great extent []

16. What would you suggest to be done to ensure that employees' technical skills enhance effective implementation of ICT projects in higher learning institutions in Kenya?

.....

Part F: Implementation of Information and Communication Technology Projects.

17. Kindly provide the information required in the following questions pertaining to implementation of ICT project in this polytechnic.

i. How many ICT centers are available in your polytechnic?

.....
.....

ii. How many courses of ICT are taught in this polytechnic?

.....
.....

How many students have enrolled in ICT classes/courses in this polytechnic?

.....
.....

iii. How many local members are involved in ICT projects implemented in this polytechnic?

.....
.....

iv. Were the resources allocated to implement the projects adequate?

a. Yes [] No []

v. Did the objectives intended by ICT project initiated achieved?

a. Yes [] No []

vi. Did the project initiated completed in within the timeline set?

a. Yes [] No []

THANK YOU FOR YOUR PARTICIPATION

JUDITH KALONDU BENJAMIN

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APPENDIX III: INTERVIEW GUIDE FOR THE COUNTY GOVERNMENT STAFF IN ICT DEPARTMENT, COMMITTEE MEMBERS AND TEACHING STAFF.

Answer the following questions to the best of your knowledge. This interview schedule seeks information on “Factors Influencing Implementation of Information Communication Technology Projects in Kenya: A Case of Polytechnic Centers in Kitui County

1. To what extent do the infrastructural facilities influence implementation of ICT in Polytechnic centers in Kitui County? Explain.

2. a) Who are the key stakeholders in the implementation of ICT in polytechnic centers, Kitui County: List

- b) Explain the degree of influence of the different stakeholders listed above.

3. What is the role of financial resources in ICT implementation in polytechnic centers in Kitui County?

4. Explain how the employees’ technical skills influence the implementation of ICT in polytechnic centers.

THANK YOU, JUDITH KALONDU BENJAMIN

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APPENDIX IV: TABLE FOR DETERMINING SAMPLE SIZE

Table for determining needed size S of a randomly chosen sample from a given finite population of N cases such that the sample proportion p will be within $\pm .05$ of the population proportion P with a 95 percent level of confidence.

<i>Table for Determining Sample Size of a Known Population</i>									
N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384
<i>Note: N is Population Size; S is Sample Size</i>					<i>Source: Krejcie & Morgan, 1970</i>				