

**INFLUENCE OF INFORMATION AND COMMUNICATION
TECHNOLOGY INTEGRATION ON QUALITY OF EDUCATION AT
PRIMARY SCHOOLS IN MAKINDU SUB-COUNTY, KENYA**

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Research Project Submitted in Partial Fulfillment of the Requirements for the
Award of the Degree of Masters of Education in Planning

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DECLARATION

I declare that, this research project is my own original work and has not been presented in any other University.

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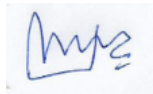
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DEDICATION

I dedicate this project to parents Duncan Masika and Sarah Wavinya, My brothers and sisters: Mandela, Mwendwa, Kioko, Muthama, Mutuku, Nduku, Kilonzo Mbinda and Esther.

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First, I am grateful to the Lord for enabling me to pursue my studies successfully.

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LIST OF ABBREVIATION AND ACRONYMS

ICT:	Information Communication Technology
IT:	Information Technology
LDD:	Learner Digital Device
MoEVT:	Ministry of Education and Vocational Training
NACOSTI:	National Commission for Science, Technology and Innovation
TDD:	Teacher Digital Device
UNESCO:	United Nations Education, Scientific and Cultural Organization
SPSS:	Statistical Package for Social Sciences

ABSTRACT

This study focuses on influence of ICT integration on quality of education at primary schools in Makindu Sub County, Kenya. The study was guided by the following objectives; to establish the influence of teachers' perceptions on ICT integration in quality of education at primary schools in Makindu Sub County, to examine the influence of availability of infrastructure on ICT integration in quality of education at primary schools in Makindu Sub County, to examine the influence of availability of human resource on ICT integration in provision of quality education at primary schools in Makindu Sub County, to determine the influence of school leadership on ICT integration in quality education at primary schools in Makindu Sub County. This study focused on teachers and head teachers to establish the influence of ICT integration on quality of education in Makindu Sub County. The sample comprised of teachers and head teachers in selected schools in Makindu Sub County. Data was collected by use of questionnaires and interview guides. Data analysis was done using Statistical Package for Social Sciences (SPSS) and presented in tables. Relevant interpretation, discussions and recommendations were drawn from the analyzed data. A major finding of the study is that ICT integration in Makindu Sub County may take time to be realized due to the fact that, ICT infrastructure in most schools within the region is lacking. The study therefore recommends that, there is need to equip the schools within the region with ICT infrastructure as well as offering in-service training for the teachers and employing qualified ICT personnel. The findings of this study may be an aid to educational planners in identifying the challenges faced during of ICT integration in schools, strategize and come up with frameworks which offer solutions to these challenges.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Integration of Information Communication Technology (ICT) is aimed at using ICT in teaching and learning processes to achieve the Government of Kenya's goal of promoting the use of ICT as a basic educational and training tool (Ogotu 2008). Information and Communication Technologies (ICTs) have had a major effect in a variety of ways on teaching, studying, science and school management. The electronic technologies are used to access, process , store, manipulate and present or communicate information Mohamud (2015).

According to Saravanakumar (2018), quality education depends on the advancement of information technology in a variety of areas, such as expanding learner motivation, enriching basic skills and increasing technology teacher training. Quality education includes: learners who are healthy, well-nourished, and able to engage and learn and support their families and communities in learning; atmosphere that is stable, clean, secure, and responsive to gender, and provides sufficient services and facilities.

Although ICT is now at the forefront of attempts to improve education, not all countries are currently able to take advantage of the innovations and advancements that technology can bring Kozma & Anderson (2002). Developing countries face entry, pedagogy or assessment-related problems as they use ICT to improve and reform Kozma education (2002). Since much research has been

done in technologically advanced countries in the field of technology integration in education, but little in developing countries, few statistics are available from Jhurreev (2005) developing countries.

As an area lagging behind in ICT sector development, usage and creativity, its people were losing out on better education and well-managed educational systems and institutions. ICT has made a major contribution to educational planning at the Peeraer and Petergem schools worldwide (2011). The concept that teaching and learning can be achieved effectively through the application of electronic communication facilities between teachers and students is one that has created hope and dismay at times, and at other times, excitement and fear. Recognition of the enormous transformation ICT has undergone at the basic school level is also among the driving factors for implementing ICT has undergone in recent times as a result of the rapid changes in technology, coupled with the effects of globalization Asare (2010).

There are several major factors that are thought to influence ICT integration on quality of education. First, the teachers' perception which is the thoughts or mental images which teachers have about their professional activities and their students, which have been repeatedly, studied as a means to evaluate the effectiveness of teaching thinking Ali (2001) Rosnani & Suhailah, (2003). Many researchers have demonstrated that certain teacher behaviours influence student's achievement. Some of these behaviours may include: teacher self-concept, social relationship, and thinking abilities Dunn (1998), Smith (2002), Thibeault (2004) and Tyler (2009).

Availability of infrastructure is another factor which may influence ICT integration; it consists of network availability, availability of computers and other ICT facilities. Access to the internet is highly limited in remote areas, and relatively poor infrastructure in developing nations such as supply of electricity makes this worse Gulati (2008). Low infrastructure is the fundamental problem for developing countries to deal with and it might take a long time and huge funding to improve. Low literacy rates also hinder locals in remote areas from accessing information through the internet and due to the dominance of English on the internet; non-English speaking local people are isolated from the benefits of using internet Parliamentary Office of Science and Technology (2006).

Another challenge of developing nations to adopt ICT in education systems is a lack of trained teachers and trained technicians Gulati (2008); Kozma (1999). When it comes to practically applying ICT, which is new to traditional teachers, many may not know how to deal with it and sometimes they are reluctant to accept new technologies in their classrooms. Thus, tutors who can train these teachers about new technology and IT professionals who can technically install and maintain the system are needed. This can be achieved through teacher empowerment in terms of their acquired content knowledge and skills in teaching ICT. Empowerment is a process whereby school participants develop the competence to take charge of their own growth and resolve their own problem Greer & Melvin (1994). People usually like to have confidence in them that they possess the knowledge and skills required to improve the situation in which they operate. It is therefore necessary to ensure that teachers, who are charged with the responsibility of translating educational plans into action, are

confident enough of their own competency. Maeroff (1988) states that adequate human resources consist of improved status, increased knowledge and access to decision making.

Research has also revealed that ICT can inspire students in their learning by introducing variety into the lessons, while at the same time retaining the interest of teachers in Slaouti & Barton teaching (2007). Therefore, it is a step in the right direction for the incorporation of ICT in the primary school curriculum, where learners will be given the opportunity to gain life-long insights through the use of ICT for problem solving. If teachers understand the value of incorporating technology into their lessons and obtain the requisite professional development in their fields, they may become accustomed to the use of technology tools; therefore, student learning and motivation could increase, leading to improved quality of education.

1.2 Statement of the Problem

The issue of ICT integration in education in primary schools is very important especially in the overall academic performance of pupils, growth of education and to keep pace with the rapidly changing education and job market Grace (2012). Like other developing countries, Kenya faces challenges in achieving the Millennium Development Goals and Education for All. These challenges include; infrastructural challenges, lack of trained teachers (they are just inducted), lack of confidence in teachers when handling the ICT devices, lack of time allocated in the time table, lack of power in some schools and network failure in some areas

The Kenyan government has provided infrastructure for ICT, for instance, provision of electricity to most schools and also, providing the Learner Digital Devices and Teacher Digital Devices, however reports from the Makindu Sub county offices indicated that there was limited use of ICT in teaching and learning within the sub county. Despite the availability of ICT infrastructure, and induction of teachers on ICT in the sub county, ICT was not performing well. This study sought to investigate the influence of ICT integration on quality of education at primary schools in Makindu Sub County, Kenya.

1.3 Purpose of the Study

The purpose of this study was to investigate the influence of ICT integration on quality of education at primary schools in Makindu Sub County, Kenya.

1.4 Objectives of the Study

The study was guided by the following objectives:

- a) To establish the influence of teachers' perception on ICT integration in quality of education at primary schools in Makindu Sub County.
- b) To examine the influence of availability of infrastructure on ICT integration in quality of education at primary schools in Makindu Sub County.
- c) To examine the influence of human resource on ICT integration in provision of quality education at primary schools in Makindu Sub County.
- d) To determine the influence of school leadership on ICT integration in quality education at primary schools in Makindu Sub County.

1.5 Research Questions

The following research questions were answered by this study.

- a) In what ways do teachers' perceptions influence ICT integration in quality of education at primary schools in Makindu Sub County?
- b) What is the influence of availability of infrastructure on the ICT integration in quality of education at primary schools in Makindu Sub County?
- c) What is the influence of human resource ICT integration in quality of education at primary schools in Makindu Sub County?
- d) How does school leadership influence ICT integration in quality of education at Primary schools in Makindu Sub County?

1.6 Significance of the Study

The findings of this study may be used by teachers to improve class room delivery in order to enhance quality of education. This study may also be an aid to education stakeholders in identifying the challenges faced during of ICT integration in schools, strategize and come up with frameworks which offer solutions to these challenges. These findings may also be of value to policy makers on designing ways of improving teachers training on ICT integration, it is expected that this study will add to the body of knowledge in educational planning and management. This study will be of aid to scholars in their research on the influence of ICT on education as well as ways of improving quality of education by use of ICT.

1.7 Limitations of the Study

The researcher was not in a position to control the attitude of the respondents as they responded to questions hence they may have chosen to give biased responses that may have resulted in the study having inaccurate findings. The researcher nonetheless assured the respondents that information received from the field was to be used for academic purpose only and it will be confidential and urged the respondents to be truthful in providing the responses. Some public primary schools in Makindu Sub-county are also remotely located which posed a major challenge for the researcher to access them; however the researcher ensured that every school was visited, despite its location.

1.8 Delimitations of the Study

The study focused on influence of ICT integration on quality of education at primary schools in Makindu Sub County. Teachers' perception, ICT infrastructure, ICT human resource, school leadership and ICT integration were the variables for this study. The study was confined to school heads and teachers in primary schools in Makindu Sub County only.

1.9 Assumption of the Study

Since ICT integration plays a role in improving the quality of education this study was based on the following assumptions:

- That Information and Communication Technology Integration enhances the quality of education.
- Information and Communication Technology provision in the schools affects the provision of quality education.

1.10 Definition of Significant Terms

ICT human resource: refers to presence of a person or employees who is adequately skilled and competent to facilitate ICT integration.

ICT infrastructure: refers to presence of fundamental ICT facilities and systems serving a school, including the services and facilities necessary for its implementation. Examples include; power and internet connectivity.

ICT integration: refers to use of automated tools to communicate, create, disseminate, store, and manage learning in public schools.

Influence: refers to the power to affect or manipulate something

Quality of education: According to the Education for All: Global Monitoring Report 2005 - The Quality education characterize most attempts to define quality in education: the first identifies learners' cognitive development as the major explicit objective of all education systems.

Teachers' perceptions: refers to the thoughts or mental images which teachers have about ICT implementation, which are shaped by their background knowledge and life experiences, and influence their professional behavior.

1.11 Organization of the Study

The study is organized into five chapters. Chapter one presents the background to the study,

Statement of the problem, purpose of the study, objectives of the study, research questions,

Significance of the study, limitations of the study, delimitations of the study, basic assumptions of the study and definition of significant terms.

Chapter two covers the literature review and the conceptual framework. Chapter three describes the research methodology which looked at the research design, target population, sample and sampling procedures, research instruments, Validity and reliability of instruments, data collection procedures and data analysis techniques.

Chapter four deals with data analysis and discussion of findings while chapter five consists of the summary, conclusions, recommendations and suggestions for further research.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter presents literature review on the study variables. This is achieved through theoretical review as well as empirical review. The chapter also draws the research gap as well as presenting theoretical and conceptual framework.

2.2 Information Communication and Technology Integration and Quality of Education

The use of ICT in education has helped improve the quality of education. Information and communication technology entails use of computers, radios, televisions, laptops and many other hardware and software application. Schools use ICT to store data, distribute information and also in classroom teaching and learning.

Successful use of ICT initiatives achieves three related objectives: availability, access, and demand. ICT educational tools are not for making educators master ICT skills themselves, but for making educators create a more effective learning environment via ICT. Teachers can utilize ICT tools to get benefits from using these tools in the areas of content, curriculum, instruction, and assessment (Sharmila Devi ,Mohammad Rizwaan , Subhash Chander June 2012).

The current Kenyan government has played an important role in ensuring that ICT is integrated in teaching and learning in order to improve the quality of education in Kenya. They have provided electricity to majority of primary schools and also provided some Teacher and Learner digital Devices to enhance

ICT integration. The integration of ICT in education at basic level equips learners with the knowledge of ICT which in turn gradually improves the quality of education. As a result the use of ICT in teaching and learning will not only enhance learning environments and quality of education but also prepare next generation for future lives and careers (Wheeler, 2001).

The literature reviewed in this section is meant to establish the research gap to justify this study and also to show the connection with the theories reviewed in this chapter.

2.3 Teachers' Perception on ICT Integration and Quality of Education

numerous international research have indicated that secondary school instructors lack abilities on the usage of ICT as a pedagogical tool in teaching and mastering manner (Nihuka & Voogt, 2011; Bingmlas, 2009). despite the fact that there is a dramatic effect and increase of ICT inside the society, many school rooms, staffrooms, faculties and faculties have not completely embraced ICT in coaching and learning inside the study room (Ndibalema, 2014). The examine with the aid of Almadhour (2010) on the combination of ICT in pedagogy by secondary college instructors in teaching in NewZealand, recognized equipment inclusive of net, virtual Cameras, video, video cameras and video players as pedagogical tools. The take a look at found that those equipment were utilized in coaching however the maximum tool used become the net. Cameras had been used simplest to make picture and video of researched sports. The examine through Afamasaga-Wright (2008) on trainer perceptions of ICT in secondary school in Samoa famous the similar findings that the internet became commonly utilized by

instructors to look information for coaching. The examine suggests that motion pictures had been used too as a records trainer used it to provide “conflict of the arena”. instructors had positive perceptions closer to ICT which resulted to higher degrees of student pastimes, engagements, unbiased getting to know and motivation, consequently ICT integration improved the satisfactory of education.

Condie and Livingston's (2007) research found that while some teachers remain hesitant to experiment with new technologies, others remain unwilling to pursue new methods that they consider may have a detrimental effect on the outcome of the test. Papaionnou and Charalambous did a review (2011) on principals' attitudes towards ICT and their perceptions about the factors that facilitate or inhibit ICT integration in primary schools in Cyprus. The study employed a mixed method approach, where 336 primary school principals over Cyprus were targeted. Using a stratified random sampling method, 250 were selected to participate in the study. Data was collected through questionnaires which were mailed to the principals but only 130 questionnaires were returned. Eight principals were also interviewed. According to the findings of the research, primary school principals in Cyprus generally hold positive attitudes towards ICT. Making use of ICT to support learning and teaching seems to be perceived as a risky strategy for some teachers so they prefer to stick with already existing methods which have been tried and tested since they believe it enables them to predict and control outcomes more easily.

Mndzebele (2013) carried out a review of the teachers' readiness of teaching ICT as a subject, integrating ICT to the other subjects in Swaziland, taking into consideration the challenges encountered in the classrooms. A quantitative

research design was used through a questionnaire to collect data from a sample of schools. Systematic sampling was done on the schools in terms of region, location (urban/rural) and type of school (government, mission/church or community). A qualitative research design was also used to collect data through interviews in all teacher education institutions in the country. The study reveals that the Ministry of education has to build an education and training system that will support the teaching ICT as a subject and ICT integration in teaching and learning.

A study in Singapore by Teo (2006), on the observations of ICT-mediated lessons identified several barriers to teacher ICT-integration in the classroom. These barriers involves inadequate appointment of technical support staff, inadequate appointment and training of student ICT helpers, lack of sufficient time for teachers to prepare for ICT-mediated lessons, insufficient collaboration among teachers in preparing ICT-mediated lessons, lack of support provided by school leaders in addressing teachers' ICT concerns, and insufficient training and demonstrations or advice for teachers on how to incorporate ICT into classroom instruction. The study does not show the realities on teachers' attitudes towards the use of ICT as a pedagogical tool.

The study in Cyprus by Dirckinck-Holmfeld, Hodgson, Jones, de Laat, McConnell and Ryberg Dirckinck-Holmfeld (2010) shows that curriculum and school manuals do not include ICT integration; there is lack of supporting materials for each learning unit. Teachers, therefore, need to spend excessive amounts of time to find, assess, revise and adjust learning materials, activities and tools to fit to the needs of their students and the curriculum. Peeraer and Van

Petegem (2009), assert that important barriers to use of ICT in teaching and learning are the teacher educators' computer skills and confidence in using ICT. However lack of exposure to lessons fully-designed with ICT tools, lack of opportunities to try I CT, the need to practice in a technology laboratory, lack of educational technology teachers, an exam-driven educational system and studying to learn only what is to be tested were some of the underlying reasons for the prospective teachers' negative perceptions of ICT use in the teaching process (Hismanoglu, 2012).

Another study by Padraig Wims and Mark Hawler (2007) looked at the implementation of ICT projects in selected educational institutions with a view to making recommendations on how such projects can be deployed and supported. The findings were from two secondary schools- St. Patrick's High school and Singore Girl's Secondary school, an agricultural training college, Baraka Agricultural College. The ratios of students to computers in the institution surveyed were: St. Patrick's, 25:1; Singore, 32:1 and Baraka, 4:1. In St. Patrick's, the computer laboratory had 16 working computers, with an average of 1:5 students per computer. Singore had a laboratory of 10 computers and an average class size of 15 or a ratio of 1:5 students per computer. In Baraka Agricultural College, students had access to a computer laboratory of 12 computers. Only 12 students attended classes at any given time, allowing for a ratio of 1:1.

Malaysia, Lau and Sim (2008) made the following observations: use of ICT for teaching and instructional support was reported at 75 per cent and classroom management at 49 per cent with least use for communication with peers at 26 per

cent. For teachers ICT competency, respondents considered themselves to be excellent or good.

2.4 Availability of ICT Infrastructure and Quality of Education

Technology is not the teacher; it is a tool the teacher uses to widen the student's reach and should complement and enhance what a teacher does naturally. Bassett (2005) acknowledged the digital age is not about technology; it is about what the teachers and the learners are doing with the technology to extend their capabilities. As Kleyn Kennedy (2006) stated, "infrastructure is key to developing sufficient technology skills" (p. 43). This study attempted to show that teachers who use technology tools in their classrooms would improve student learning and motivation. "Today's education system faces irrelevance unless we bridge the gap between how students live and how they learn. Students will spend their adult lives in a multi-tasking, multifaceted, technology-driven, diverse, vibrant world-and they must arrive equipped to do so" (Reyes, Gillock, Kobus, and Sanchez. 2000). Schools, even those reporting successful use of ICT, report very different levels and configurations of technology (Jonassen *et al.*, 2008). One Norwegian school had a ratio of two students per computer, a wireless network, and a student body who almost all had computers at home. A second school in Norway in contrast reported 18 students per computer, and almost all of the computers were in a room where teachers had to reserve time to get access. Students were not allowed in the computer room unless teachers were present. At the time of the study, the student-to-computer ratio in the case study schools ranged from 2:1 to 26:1. Sometimes, even where the level of equipment appeared high, some of the computers were quite old. In Israel, one school had a ratio of

seven students per computer, but all of the computers were over six years old. In Finland more than half the computers in one school were considered obsolete. In most schools, equipment was under-funded, often composed of a mixture of old and new machines that made maintenance and software updating difficult. Internet connectivity is of great significance for schools. By giving access to the web services, Internet access will promote student-centered learning activities. Internet connectivity allows for a broad variety of networking practices, including connections to other schools, connectivity to parents and distance learning. For several of the case study colleges, access to the Internet was not in any of their ICT plans.

According Teck and Lai (2011) teachers and school administrators much ensure that computers in the access centers or laboratories are utilized for beneficial activities and not merely for recreational activities such as playing games or online chatting. Applications such as spread sheet, database, word processing and introduction should be utilized for educational purposes as well searching for useful info via web browsing. Parents act as a significant function in furnishing the necessary facilities like computer and Internet access at home whenever possible to mould up and propel their children in adopting ICT in their everyday lives.

A study by Nyaga (2014) set out to investigate challenges facing effective ICT implementation in selected Public Secondary Schools in Nakuru North District Nakuru County. The main objective of the study was to explore factors that challenge effective ICT implementation which can play a significant role in equalizing opportunities for marginalized groups and communities. Head

teachers, Deputy Head teachers and teachers in Public Secondary Schools in Nakuru North District formed the target population. Systematic sampling technique was used to select ten schools from a list organized in order of performance of Mock exams (2012) by public secondary schools in Nakuru North District. Eight (8) teachers were randomly selected from each school for the study giving a total of 80 teachers. Head teachers and deputy head teachers were purposively selected from the ten selected schools to have a total of ten head teachers and ten deputy head teachers. The total sample size for the study was 100 respondents. The research design used was a descriptive survey design. The data was presented using tables, bar charts and pie-charts. Based on the findings of the research it was concluded that there were a number of challenges facing effective implementation of ICT in schools in Nakuru North District. These challenges included: few computers and computer labs, insufficient internet connectivity, power unreliability and lack of sufficient equipment such as LCD projectors, speakers among others to enhance effective implementation. The study also concluded that efforts by the ministry to sustain ICT implementation projects in schools are very minimal especially in the rural districts.

2.5 Availability of ICT Human Resource on Quality of Education

According to the MOE (2012), shortage of teachers has led to constrained effective delivery in the implementation of curricula and consequently resulted in poor performance in schools. Records management in most learning institutions is weak which has led to data gaps and poor response to EMIS data submissions. Furthermore, inconsistent and inaccurate statistical data from schools has led to inefficiency in administrative processes. These issues would

be well managed using ICT tools. However, when ICT tools that are available in schools are not maintained, and with limited technical support available, the result is limited use of ICTs in administration. The Directorate of Policy and Planning in the Ministry of Education acknowledges that there are many infrastructural limitations to the integration of ICTs into schools (GeSCI, 2009).

Research conducted found that e-mail was yet to be recognized as a tool for collaboration among students and teachers (Kenya schoolnet 2003). In Schools surveyed, access to the internet was severely limited and when available was only for administrative use. The study found that almost 40 per cent of these schools had less than 10 computers and were therefore inadequate for teaching and learning. More than 20 per cent had less than 5 computers, indicating that the computers mostly for administrative use.

It is generally believed that ICTs can empower teachers and learners, promote change and foster the development of the 21st century skills, but data to support these beliefs are still limited. On the other hand, ICTs is also believed to be able to contribute to the enhancement of learning in the world since these tools can play a role in reforming education systems, increasing access to pedagogical resources, improving the management of education and enhancing pedagogical techniques (Kuyoro, Awodele, & Okolie, 2012). However, the experience of introducing different ICTs in the classroom and other educational settings all over the world over the past several decades suggests that the full realization of the potential educational benefits of ICTs is not automatic.

The effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology indeed, given enough initial capital, getting the technology is the easiest part, but also curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing, among others (Tinio, 2003). ICT has the power to increase motivation and learner engagement and helps to develop life-long learning skills. As a powerful educational tool, ICT can facilitate the transformation of school education. But to make this happen it is vital to bring about the changes to the mind set and culture among teachers, administrators, parents and students; the way in which the curriculum is designed and delivered and how students are currently assessed.

2.6 School Leadership and ICT Integration on Quality of Education

If school head teachers focus more of their influence on improving the quality of teaching and learning in their school, then they are likely to have a far greater influence on students' outcomes. They play a major role in ensuring that the education policies are implemented. Dinham (2008) indicated that a specific emphasis on teaching and learning was common in schools where student results were considered to be exceptional. Leadership by Principals is a vital element in developing and sustaining an atmosphere where teachers can teach, students can learn and exemplary results can occur (Louis, Leithwood, Wahlstrom, & Anderson 2010). Teacher quality is a key focus of teaching leadership, and this model seems to be aligned better with this study. In reality, transformational leadership has been criticized for not providing sufficient focus on education, e.g. (Marks & Printy,2003).for not having adequate emphasis on education.

Notwithstanding the influence of school leaders, many researchers (e.g., Mulford, 2008; Witziers, Bosker & Krüger, 2003) have concurred that the impact of school management could be oblique. The contributions of head instructors can be moderated via organizational factors along with instructors, lecture room practice and college subculture. those factors can extensively reduce the direct effect head instructors have on outcomes attained through their college students. Although more than one forces may mediate the have an effect on of faculty leadership on the learning in their students, head teachers can affect the running conditions and motivations of their teachers, who do directly impact classroom practice and pupil gaining knowledge of (Pont et al., 2008). Instructional and transformational management models overlap on elements including college lifestyle and instructor reviews, and consequently might both assist leaders in enhancing pupil outcomes through their affect over those factors. Involving group of workers within the development of a shared school imaginative and prescient may definitely influence both faculty lifestyle and instructor teacher experience.

2.7 Summary of Literature Review

Summary of literature review shows that there is a positive relationship between ICT integration and quality of education. It is important to understand that for primary schools to adopt and integrate ICT in order to improve quality of education they have to perceive technology as a better practice which is consistent with existing needs and ease of use. From the literature reviewed, many countries have put efforts to integrate ICT in teaching and learning, however, there are issues that have made the integration slow. However, the literature is scarce in linking up the independent variables (teachers' perception,

availability of infrastructure, school leadership and human resource) and the dependent variable (quality of education). This study will therefore add to the knowledge of the said variables focusing on Makindu Sub-counties in Makueni County, Kenya. In addition, little study has been conducted to establish the influence of ICT integration on quality of education at primary schools in Makindu Sub County. This study therefore aims to establish the influence of ICT integration on quality of education at primary schools in Makindu sub county, Kenya.

2.8 Theoretical Framework

The study was guided by two theories namely Model of IT Implementation Process and Open System Systems Theory. The Model of IT Implementation process is based on organizational change, innovation and technological diffusion. This model offers a directing and organizing framework for ICT implementation. The model comprises six stages, namely: initiation, organizational adoption, adaptation, acceptance and adoption, routinization and infusion (Cooper & Zmud, 1990). Thus, the model covers an implementation process from scanning the organizational needs to a full and effective use of the technology in daily practice. The model also identifies five contextual factors which impact on processes and products in each implementation stage: the characteristics of the user community, the organization, the technology being adopted, the task and the organizational environment (Cooper & Zmud, 1990). This theory plays a role in this study in that it provides a guideline for when applied to ICT integration in teaching and learning, it offers a methodology for

implementing ICT integration to education which plays a role in improving the quality of education.

In Open System Systems, the school being a typical example of an organization is viewed as a socio-technical system composed of four sub-systems: human, technical, structural and task (Owens & Steinhoff, 1976). The school subsystem is composed of teachers, administrators and support staff who deliver instructions, implement educational objectives and evaluate student progress. If they are going to perform these tasks they require structure. Finally the organization must also have technological resources in order to complete tasks. The schools subsystems interact with the external environment in such a manner that altering one would necessarily lead to changes in all the others. Therefore when considering the introduction of innovations in schools, it is important to recognize the inter-dependencies and interactive nature between the four subsystems and also with the external environment. The subsystems are thus critical elements to be dealt with when attempting to initiate change or implement an innovation in an organization. This theory is relevant in this study because the influence of ICT integration on quality of education has interrelated tasks which individually play a role in the life of a complete system. It focuses on the educational system and its subsystems working together to achieve common set objectives.

2.9 Conceptual Framework

Conceptual frame work is a description of the main independent and dependent variables of the study and relationship among them (Ogula 1998). This study was conceptualised using the variables in the objectives.

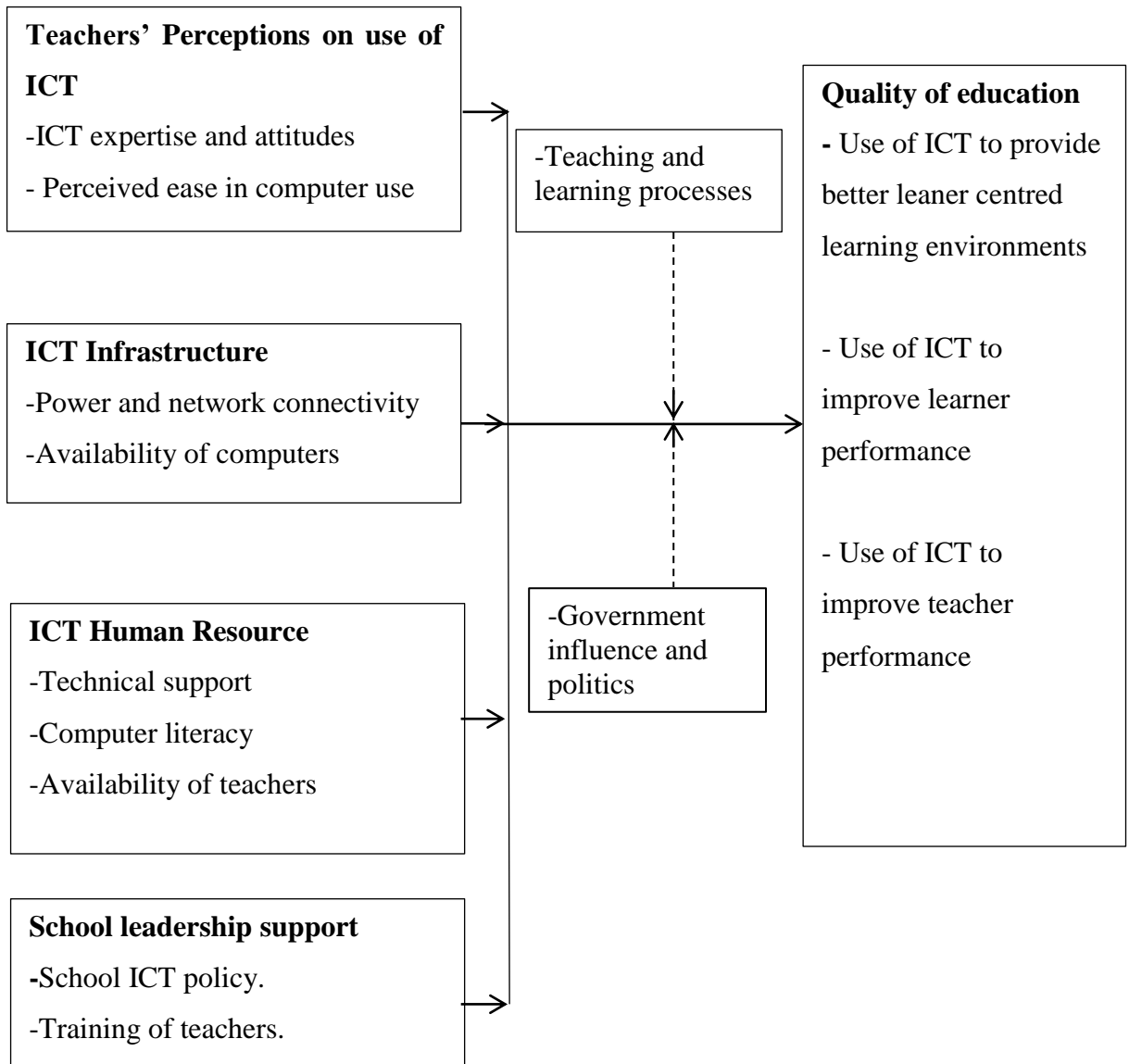


Figure 2. 1: The relationship between Influence of ICT Integration and quality of Education

In figure 2.1, Quality of education depends on the variables under ICT integration which include; teachers' perceptions on ICT, availability of ICT infrastructure, availability of human resource and the school leadership support on ICT. These variables influence ICT integration in quality of education. Some indicators of ICT integration on quality of education include; improved learner performance, better learning environments for learners as well as improved teacher performance. These factors are influenced by the intervening variable and the moderating variables; the intervening variable is teaching and learning process while government influence and politics are the moderating variables.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter highlights the methods and techniques of research that were used to carry out this study. These consists of; research design, target population, sample size and sampling procedure, research instruments, validity of instruments, reliability of instruments data collection instruments, data analysis techniques and ethical considerations.

3.2 Research Design

The research design employed in the study is descriptive survey, to establish the influence of ICT integration on quality of education in primary schools in Makindu sub county, Kenya. This design was appropriate for this study since it helped in gathering information; summarizing, presenting and interpreting it for the purpose of clarification (Orodho, 2002). This design is usually used in collecting data concerning the current status of the subjects in the study. The data can be used to describe possible behavior, attitudes, values and characteristics of the phenomenon under study (Mugenda and Mugenda, 2012). This design was suitable for this study because it enabled the respondents to give their opinions in relation to the influence of ICT integration on quality of education at primary schools (Kombo & Tromp, 2006).

3.3 Target Population

The population for this study entailed primary schools in Makindu Sub-County. There are 65 registered primary schools, the target population is therefore head teachers from 65 schools with a 764 classroom teachers in primary schools in Makindu Sub County. They were targeted because they play a pivotal role to ICT integration, as well as implementing the government policies on ICT integration in teaching and learning.

3.4 Sample Size and Sampling Technique

According to Gay (1992) as the sample size approaches the population size, the more representative it is. Given the small population for the school heads for this study, the researcher used census to study all the 65 head teachers. Simple random sampling was used to select five teachers from each school. Therefore, the respondents for this study consisted of 65 head teachers and 325 teachers adding up to 390 respondents.

3.5 Research Instruments

In addition, the study used interview guides to obtain data from the school heads. The research employed the teachers with standardized questionnaires. Orodho and Kombo (2003), notes that respondents fill in the answers provided by the researcher in questionnaires, and the researcher gathers the completed information. The questionnaires were used to yield responses on attitude/perception of the respondents on a five point likert type of scale as follows: using this scale, 1 represents “Strongly agree”, 2 represents, “Agree”, 3 represents, “Undecided”, 4 represents, “Disagree” and 5 represents “Strongly

disagree”. The questionnaires were used to collect data from teachers on the influence of ICT on quality of education.

3.5.1 Instrument Validity

Validity is the degree to which a sample of the test items represents the content it is designed to measure (Gall and Borg, 2007). To ensure validity of the research instruments, a pilot study was done in three pilot primary schools that were also included in this study. The results obtained were significant for the study; therefore the researcher administered the research instruments to the primary schools for data collection in Makindu Sub County. The researcher also sought the guidance of the supervisors in order to improve the validity of the content in the instruments used.

3.5.2 Instrument Reliability

Reliability is a measure of the degree to which the instrument yields consistent results or data after repeated trials (Mugenda and Mugenda, 2003). The researcher tested the reliability of the research instruments by carrying out a pilot study in two primary schools. The findings from pilot study helped to determine the instruments reliability.

The researcher checked the responses from the pilot for consistency and relevance, as well as any omissions of content. According to (Obonyo 2013), pilot study findings help to improve the instrument items before the actual research is done. A reliability correlation coefficient was established using Pearson Product Moment Correlation Coefficient which was computed in order to determine the reliability of the instrument. The formula below was used:

$$r_{xy} = \frac{\sum(x-x^-)(y-y^-)}{N S_x S_y}$$

Where: r_{xy} = Person Product Moment Correlation Coefficient

$(x - x^-)$ = Variance X

$(y - y^-)$ = Variance Y

S_x = Standard Deviation of X

S_y = Standard Deviation of Y

Σ = Summation

N = Dispersion

A coefficient of 0.80 or more simply showed that there is high reliability of data Mugenda and Mugenda (1999), a reliability coefficient of 0.83 for the pilot study was obtained thus the instruments were considered to be reliable.

3.6 Data Collection Procedures

The researcher received an authorization letter to carry out the research from the University of Nairobi and a permit to conduct the research was obtained from the National Commission for Science, Technology and Innovation (NACOSTI). The researcher booked appointments with the respondents to visit and administer the questionnaires. The researcher personally administered questionnaires to all the respondents who were given adequate time to complete all the items, after which the researcher collected the questionnaires once they were filled. During the administration of the questionnaires, data from observations and focus group discussions was collected. The school heads interviews were conducted on the days agreed upon.

3.7 Data Analysis Techniques and Procedures

Data collected using the research instruments was both qualitative and quantitative in nature. The source of qualitative data was open ended questionnaire items and interview guides which was analyzed, interpreted and presented descriptively. Closed ended questionnaire items were the source of quantitative data. The collected data was first scrutinized for errors and completeness. The data collected was coded and entered in the computer for analysis using the Statistical Package for the Social Sciences (SPSS) version 21 for windows to generate the required descriptive statistics. Descriptive statistics was used to analyze the quantitative data to generate frequencies and percentages while qualitative data was analyzed thematically and converted into frequencies and percentages.

3.8 Ethical Considerations

According to Coolican (2010), researchers need to conduct their research through ethical principles. In this study, to ensure ethical concerns are adhered to, Respondents' consent was sought before engaging them in the research. Moreover, anonymity of respondents was ensured and information they provided was held confidential for the purpose of the study.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter covers the analysis of data and presentation of results for the study. The data presented covers respondents' demographic data that includes gender, age and professional qualifications. The chapter also presents the results and discussion of the study objectives.

4.2 Questionnaires Return Rate

The researcher distributed 325 questionnaires to the respondents and the response rate is shown by the data on Table 4.1

Table 4. 1 Questionnaire Return Rate

Respondents	Sampled respondents	Returned questionnaires	Interviewed headteachers	Achieved return rate (percent)
Head teachers	65	0	65	100
Teacher	325	300	0	92.30

The information on table 4.1 shows that almost all teachers (92%) of the respondents returned the questionnaires; the data further shows that all the head teachers (100%) were interviewed. According to Mugenda and Mugenda (2003), the questionnaire return rate above 70% is considered representative enough. The response rate was satisfactory this could be attributed to the fact that the respondents were assured of confidentiality of the information they provided.

4.3 Demographic Data of Respondents

The demographic data provides information about the sampled population structure. In this study, the researcher investigated the subjects' characteristics by establishing their gender, age, and academic/professional qualification.

4.3.1 Gender of Respondents

The study sought to establish how the sample population was distributed by gender. Table 4.2 reveals how the respondents were distributed by gender.

Table 4. 2: Gender of Teachers

	Frequency	Percent
Male	190	63.3
Female	110	36.7
Total	300	100.0

The data on table 4.2 indicates that majority (63.3%) of the teachers were male. From the findings it can be said that all genders were not fairly represented in the study. This was also an indication that majority of the teachers in Makindu Sub County are males.

4.3.2: Age of Respondents

Table 4. 3: Age of Teachers

Age	Frequency	Percent
23-29 years	120	40.0
30-39 years	70	23.3
40-49 years	50	16.7
Over 50 years	60	20.0
Total	300	100.0

From Table 4.3 respondents (80%) were in the age bracket of 23-49. This age is highly productive and dynamic and can embrace ICT integration in teaching and learning. This may explain why most teachers are positively embracing the use of ICT in their schools. It can also be interpreted that all the respondents in the study were mature and understand the importance of integrating ICT into teaching and learning in primary schools.

4.3.3: Professional Qualification

The study also sought to establish the academic qualification of the teacher respondents. This was established after administering questionnaires to teachers. The findings obtained are revealed in table 4.4.

Table 4. 4: Highest level of Education

	Frequency	Percent
Masters	36	12
Degree	34	11.33
Diploma	49	16.3
Certificate	180	60
Total	299	96.7
Total	300	100

Table 4.4 shows that the professional qualification attained by majority (60%) of the teachers is P1 certificate, followed by Diploma holders at 16 percent. From the result there is a missing value at 3.3 percent indicating that 1 respondent was not able to share their professional qualification. Different professional qualifications affect how the teachers integrate and embrace ICT in their day to day learning and teaching activities in the classrooms.

4.4 Influence of Teachers' Perceptions towards ICT in Makindu Sub County.

To find out the teachers perception towards ICT, the teachers were asked to respond to some ICT related statements by selecting the most appropriate statement related to their perception. The statements were tabulated in a Likert scale and the responses ranged from 1-strongly agree; 2-agree; 3- uncertain; 4-disagree; 5-Strongly disagree. The Findings are as shown in the data in table 4.5.

Table 4. 5: Teachers Perceptions on ICT

Statement	Strongly agree		Agree		Not sure		Disagree		Strongly disagree	
	F	%	F	%	F	%	F	%	F	%
The use of computer will allow me to develop my teaching.	200	66.7	30	10.0	0	00.0	50	16.7	20	6.7
Getting to know integration of ICT in curriculum implementation takes up too much of a teacher's time.	10	3.3	30	10.0	10	3.3	50	16.7	200	67.7
ICT integration imposes excessive demands on teachers.	30	10.0	55	18.3	5	1.7	60	20.0	150	50.0
The use of ICT interferes with other aspects of my work	20	6.7	30	10.0	5	1.7	45	15.0	200	66.7
The school as a whole benefits from the introduction of ICT	200	66.7	30	10.0	0	00.0	50	16.7	20	6.7
Integration of ICT in curriculum implementation is effective in developing learners' knowledge and skills.	200	66.7	30	10.0	0	00.0	50	16.7	20	6.7

From table 4.5 majority (66.7%) of the teachers felt that using a computer will allow them to develop their teaching skills. Another majority (67.7%) strongly disagreed that ICT integration in curriculum implementation took a lot of their time. The data also showed that majority 66.7% felt that the school as a whole benefits from the introduction of ICT. They (66.7%) also felt that Integration of ICT in curriculum implementation is effective in developing learners' knowledge and skills. In general, majority of the teachers expressed positive attitude towards of ICT integration. This study is in line with a study by Mndzebele (2013) which established that teachers have positive attitude towards ICT integration despite the shortcomings they experience. The study further reveals that the Ministry of education has to build an education and training system that will support the teaching ICT as a subject and ICT integration in teaching and learning.

4.5 Influence of Infrastructure on ICT Integration in Quality Education at Primary Schools in Makindu Sub County.

The study sought to find out the availability of ICT infrastructure in the respective schools and the respondents were asked if they had computers in their respective schools, the types of the computers available, the number of the available computers, the state of internet connection and power (electricity) connection in the respective schools. The data is as presented in tables as shown.

Table 4. 6: Availability of Computers

Availability of Computers in Schools

	Frequency (F)	Percent (%)
Yes	100	33.3
No	199	66.3
Total	299	99.6
Missing System	1	0.3
Total	300	100.0

Table 4.6 shows that majority of schools in the area lacked computers. This is evidenced by the fact that majority (66.3%) of the teachers responded that they don't have computers in their schools.

The study further sought to find out the type of the available computers in the various primary schools in Makindu Sub County and the findings is as presented in table 4.7.

Table 4. 7: The Type of Computers Available in the Schools

	Frequency	Percent
Desktops	210	70.0
Laptops	90	30.0
Total	300	100.0

The data from table 4.7 shows that majority (70.0%) of the respondents felt that most of the schools use desktops while only 90 respondents felt that most of the schools use laptops.

The study also sought to find out if the school had reliable internet connection.

The result was as tabulated in table 4.8

Table 4. 8: Internet Connectivity

Availability of Internet Connection in the School

	Frequency	Percent
Yes	70	23.3
No	230	76.7
Total	300	100.0

From table 4.8, majority (230) out of 300 respondents indicated that they did not have reliable internet connection in their school. From the findings it can be concluded that most teachers and students cannot visit online site for the purpose of teaching and learning due to unreliable internet connectivity.

The study further sought to know if the school had reliable power supply in terms of electricity the findings is as tabulated in the data in table 4.9.

Table 4. 9: Power Supply

Availability of Electricity in Schools

	Frequency	Percent
Yes	200	66.7
No	100	33.3
Total	300	100.0

From table 4.9 majority (200) of the respondent said that their school had electricity and only (100) said that they did not have electricity. This implies that most of the schools have electrical power supply.

The study further sought to know the rate of power outage in the various schools that had access to electricity. The finding is as recorded in table 4.10.

Table 4. 10: Rate of Power Outage in your School

Rate of power outage (loss of power) in your school

	Frequency	Percent
Always	200	66.7
Sometimes	50	16.7
Often	50	16.7
Never	0	0.0
Total	300	100.0

From Table 4.10 all (300) respondents felt that there is a high rate of power outage none of them felt that there has never been a power outage. This means that electricity is not so much dependable and schools should go for other source of power like solar machines in order to effectively integrate ICT in their schools since the computers and servers depend on power supply for its function ability.

The study further sought to know the rate at which ICT facilities were available to improve: learners’ performance, the learner’s motivation and success, improve the employability of graduates and to provide: learners with basic survival skills and better learning environment. The respondents were asked to rate their

response on a scale of 1-4 where 1=Never, 2 = rarely, 3 = regularly, 4 = Very regularly. The response is as indicate in table 4.11.

Table 4. 11: Availability of ICT Infrastructure in School

Availability of ICT infrastructure in your School

	Frequency	Percent
Never	150	50.3
Rarely	50	16.7
Not regularly	10	3.3
Very regularly	90	30.0
Total	300	100.0

From table 4.11 (67%) majority of the teachers felt that the ICT infrastructure is never available in their schools. While only (33.3%) of the teachers strongly felt that ICT infrastructure was readily available in their respective schools. From the results it is clear that ICT integration in the various public schools in Makindu Sub County can take a bit of time before it is realized since the ICT infrastructures are not available in most of the schools as seen from the data above. This concurs with the findings by Nyaga (2014) who established that ICT integration faces challenges like: few computers and computer labs, insufficient internet connectivity, power unreliability and lack of sufficient equipment such as LCD projectors, speakers among others to enhance effective implementation. The study also concluded that efforts by the ministry to sustain ICT implementation projects in schools are very minimal especially in the rural areas.

4.6 Influence of Human Resource on the Integration of ICT in Primary Schools in Makindu Sub County.

The third objective of the study was to find out the influence of Human resource on ICT integration on quality of education in Makindu Sub County. To come up with the findings the researcher sought to find out if the teachers had any ICT related skills, if the teachers had skills on how to use internet to prepare the teaching and learning materials and whether the teachers had access to the internet. The findings are as shown in the data presented in the figure 4.1, 4.2 and table 4.12.

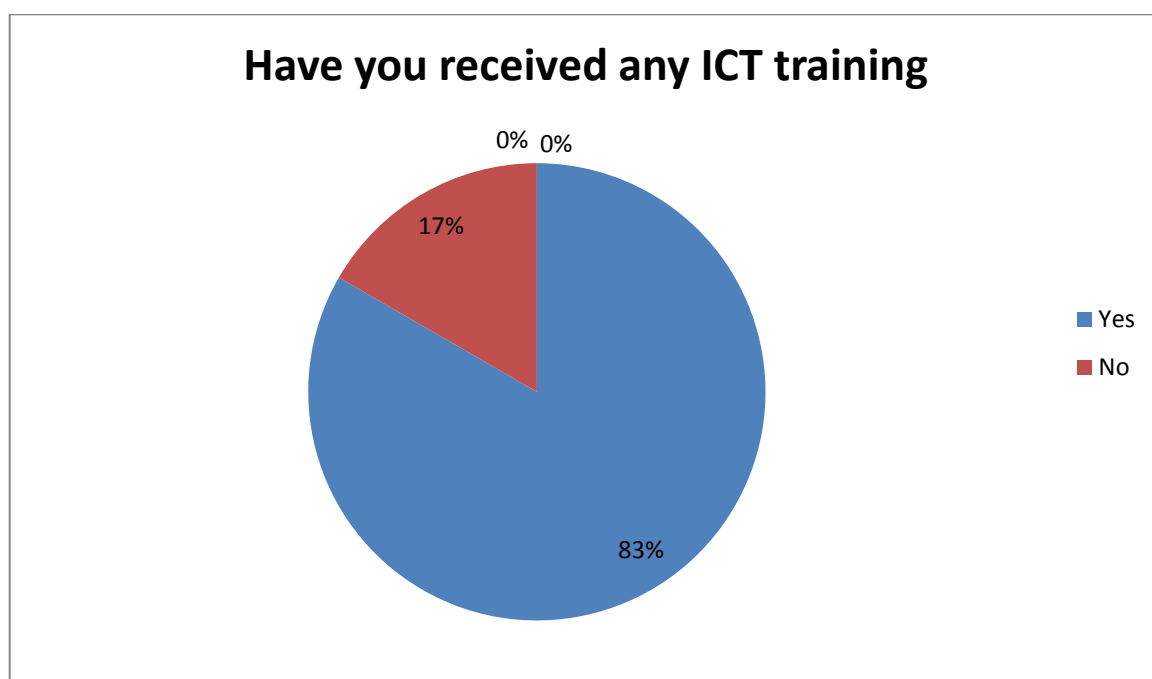


Figure 4. 1: Level of ICT literacy

From figure 4.1, majority (249) teachers had some kind of ICT training only few (51) respondents were ICT illiterate. This means that the integration of ICT into the public primary schools in Makindu Sub County was not going to receive a setback due to untrained personnel, since most of the teachers have received training on ICT.

The study further sought to know if the teachers used internet to prepare their teaching and learning materials. The finding is as presented in the figure 4.2:

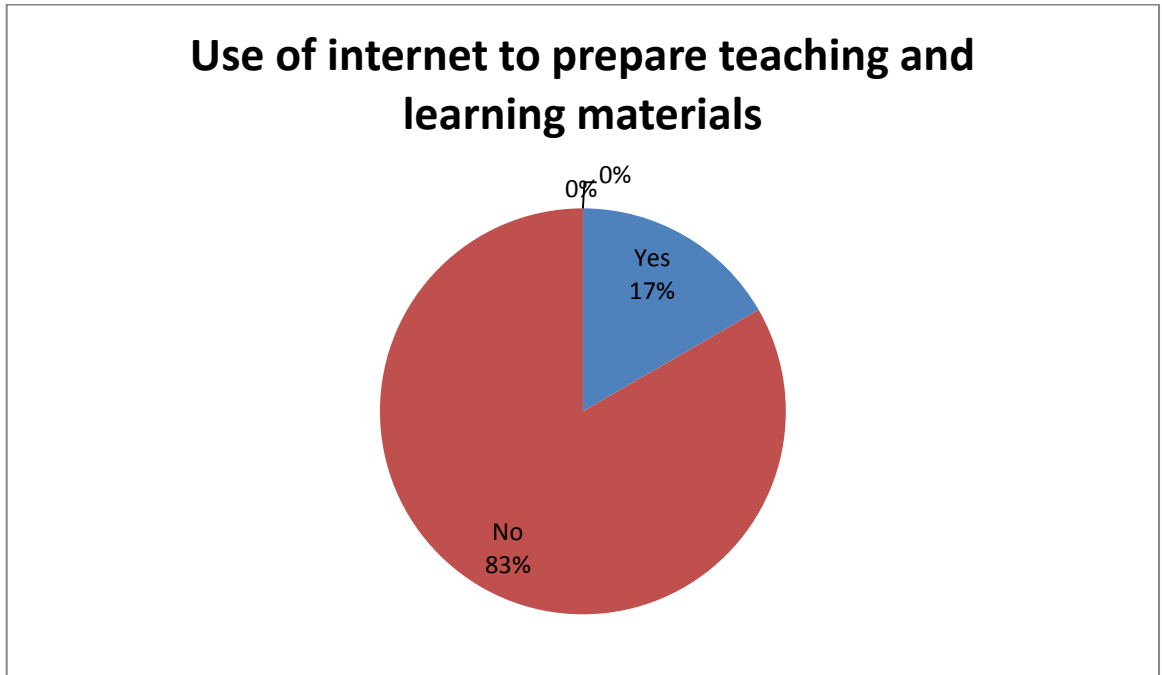


Figure 4. 2: Use of Internet to Prepare Teaching and Learning Materials

From figure 4.2, majority (249) teachers said that they did not use internet to prepare teaching and learning materials only 51 respondents said that they used internet to prepare their teaching and learning materials. This implies that most teachers do not use the internet to prepare teaching and learning materials, this may be a factor that can hinder ICT integration in Makindu Sub County.

The study also sought to find out where the respondents mainly accessed the internet and the findings are as shown in table 4.12:

Table 4. 12 Place of Accessing Internet

Place of Internet Access

	Frequency	Percent
At school	120	40.3
At home	140	46.7
Cyber Café	40	13.3
Others	0	0.0
Total	300	100.0

From table 4.12, out of 300 respondents, only few (120) teachers accessed internet services from their respective schools. While the rest (180) of the teachers accessed internet services outside the school premises. These findings implied that most teachers access the internet outside the school, which can inhibit the smooth integration of ICT which can have a negative effect on quality of education.

The data indicated that despite that most of the teachers had received ICT training, most schools had poor network connectivity thus most teachers preferred accessing the internet out of the school. This implies that despite that the teachers have received ICT training; they may face challenges in the implementation of ICT integration due to the network connectivity.

4.7 Influence of School Leadership on ICT Integration in Primary Schools in Makindu Sub County.

The fourth and final objective of the study was to find out the influence of school leadership on ICT integration in primary schools in Makindu Sub County. The researcher sought to find out how the school leadership fared in the following aspects; supportiveness in the use of ICT integration in teaching and learning, accessibility of ICT tools when needed, the encouragement of teachers by the school management to participate in learning opportunities in ICT, in this school, provision of ICT materials for use in the classrooms and if there are strategies teachers use to integrate ICT in teaching and learning. The respondents were presented with statement on a Likert scale asking them to rate how the school leadership fared on a scale of 1-4. Where 1=Never, 2 = rarely, 3 = regularly, 4 = Very regularly. The finding is as shown by data in table 4.13.

Table 4. 13: Teachers Responses on the School Leadership towards ICT

Integration

Statement	Never		Rarely		Regularly		Very regularly	
	F	%	F	%	F	%	F	%
The head teacher is supportive in the use of ICT integration in teaching and learning	73	24.3	17	5.6	200	66.7	10	3.3
The ICT tools are accessible for use when needed	50	16.7	39	13.0	11	3.7	149	49.7
The school management encourages teachers to participate in learning opportunities in ICT	30.0	10	52	17.3	42	14.0	176	58.7
In this school, ICT materials are provided for use in the classrooms.	100	33.3	40	13.3	100	33.3	60	20.0
In this school, there are strategies for teachers to use ICT in teaching and learning	50	16.7	50	16.7	0	0.00	200	66.7

The data in table 4.13 shows that majority of the teachers felt that the school leadership supported ICT integration in the primary schools in Makindu sub County. This is evidenced by the fact that majority (66.7%) indicated that the head teachers were supportive in the use of ICT integration in teaching and

learning and also that most teachers (66.7%) responded that there were strategies being laid down in the various schools for teachers to use ICT in teaching and learning. The school leadership also encouraged teachers to participate in learning opportunities in ICT, most of the respondents (58.7%) responded that the school leadership does offer support for them to participate in ICT learning opportunities. The findings of this study show that most of the school leaders in Makindu Sub County do support ICT integration in providing quality education in Makindu Sub County.

These findings concur with (Pont et al., 2008), that instructional and transformational leadership models overlap on aspects including school culture and teacher experiences, and therefore might both assist leaders in improving student outcomes through their influence over these factors. Involving staff in the development of a shared school vision might positively influence both school culture and teacher experience.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of the study, findings, conclusion and recommendations to implementation of information and communication technology integration on quality of education at primary schools in Makindu Sub County - Kenya.

5.2 Summary of the Study

The purpose of the study was to investigate the implementation of ICT integration on quality of education at primary schools in Makindu Sub County, Kenya. The study was guided by four research objectives which are: To establish the influence of teachers' perception on ICT integration in quality of education at primary schools in Makindu Sub County; To examine the influence of infrastructure on ICT integration in quality of education at primary schools in Makindu Sub County; To examine the influence of human resource on ICT integration in provision of quality education at primary schools in Makindu Sub County; and To determine the influence of school leadership on ICT integration in quality education at primary schools in Makindu Sub County.

The study used descriptive research design. The sample size comprise of 65 head teachers and 325 teachers from the various primary schools in Makindu Sub County. Data was gathered by use of interview guides and questionnaires which were analyzed qualitatively and quantitatively. Pre testing was done to gauge the clarity of the instrument items. The instruments were also validated and tested for

reliability. The summary of findings based on each objective are presented in the subsequent sub sections:

5.2.1 The Influence of Teachers' Perceptions on ICT Integration in Quality of Education at Primary Schools in Makindu Sub County.

The study established that the teachers felt that it was necessary for the integration of ICT in teaching and learning processes in primary schools. Out of 300 respondents 200 (66.7%) said that using a computer will allow them to develop their teaching skills, only 70 (23.3%) disagreed that computers will enable them develop their teaching skills.

It was also established that integrating ICT into learning process was not going to take much of the teachers' time. This is because 200 (66.7%) teachers strongly disagreed that ICT integration in curriculum implementation took a lot of their time. Only 20 (6.7%) thought that ICT integration in curriculum implementation will take much of their time.

It was further established that the schools will benefit from the inclusion of ICT in the curriculum. Out of 300 respondents 200 (66.7%) felt that the learners and teachers will benefit from the introduction of ICT in schools. They also said that Integration of ICT in curriculum implementation is effective in developing learners' knowledge and skills only 20 (6.7%) teachers said that introduction of ICT to school curriculum was another burden to the already overworked teachers.

5.2.2 The Influence of Infrastructure on ICT Integration in Quality of Education at Primary Schools in Makindu Sub County.

The study established that a big number of primary schools in Makindu County lacked computers. This was because 199 (66.3%) out of 300 respondents responded that they didn't have computers in their schools. Only 100 (33.3%) respondents acknowledged of having computers in their schools.

The study also found out that most of the teachers used desktops as computers. Out of 300 respondents 90 (30%) responded that they used laptops in their schools. This showed that a big number of teachers don't have their own computers.

The study also established that most schools have electrical power supply. Majority 200 (66.7%) admitted that they had electricity in their schools. It was further established that the power supply in the school was not reliable. This was attributed to the fact that most schools in the area experienced a high rate of power outage. Out of 300 respondents, 250 (83.3%) said that there has always been a power outage only 50 (16.7%) said that they rarely experience power outage.

It was also established that most of the schools lacked ICT infrastructure. While only 100 (33.3) respondents strongly felt that ICT infrastructure was readily available in their schools, majority 200 (67.7%) felt that the ICT infrastructure was never available in their respective schools. The head teachers also recommended the strengthening of the ICT infrastructure internet connection to schools and budget allocation for ICT maintenance costs.

5.2.3 The Influence of Human Resource on ICT Integration in Provision of Quality Education at Primary Schools in Makindu Sub County

It was established that majority of the teachers were ICT literate. This was evidenced by the fact that majority 249 (83%) out of 300 respondents said that they had some kind of training in ICT. Only 51 (17%) said that they had no ICT related training.

It was also established that the teachers did not use the internet to prepare teaching and learning materials. This can be attributed to the lack of reliable power supply and lack of ICT infrastructure in the schools. Out of the 300 respondents 249 (83%) said that they did not use internet for the preparation of teaching and learning materials. Only 51 (17%) said that they used the internet to prepare the learning materials.

The study further established that most of the school did not have internet connectivity. This is based on the fact that only 120 out of 300 respondents said that they could access the internet from their respective schools while 180 (60%) said that they accessed the internet while at home and from cyber cafes. This is attributed to the lack of internet connection in the various schools.

5.2.4 Influence of School Leadership on ICT Integration in Provision of Quality of Education at Primary Schools in Makindu Sub County

The study established that the school leadership supported the integration of ICT in the primary school structure. This is because 170 (56.6%) out of 300 respondents said that the head teachers were supportive in integrating ICT in teaching and learning activities. Only 130 (43.3%) said that the head teachers were not supportive in integrating ICT in teaching and learning.

It was also found out that the school leadership was laying down strategies for teachers to use ICT in teaching and learning. 200 (66.7%) respondents said that the head teachers were laying strategies to facilitate inclusion of ICT infrastructure in teaching and learning. Only 74 (24.8%) out of 300 respondents said that the school leadership is not laying any strategies to facilitate ICT integration in the respective schools.

The study further established that the head teachers recommended that ICT related workshops and seminars should be organized for teachers in order for them to keep abreast with the constantly evolving technology. The head teachers had also said that they had tried to seek for resources that would facilitate integration of ICT in the schools. This is because out of the 65 head teachers that were interviewed, all of them said that they were supporting ICT integration in the various schools they were leading.

5.3 Conclusion

Based on the findings of the study it can be concluded that the government should provide ICT infrastructures such as internet, computers, projectors and many other tools required to enable smooth integration of ICT into learning and teaching in classrooms. On job training is also required for some of the teachers who are ICT illiterate in order for them to have knowledge and skills required to integrate ICT in teaching and learning in the classroom environment. The teachers should be provided with ICT gadgets like laptops so that they can use and advance their profession through ICT applications which will enable them to integrate ICT in their teaching methodologies and choose on the teaching

methods that are ICT oriented. Methodologies that will allow for integration of ICT infrastructure in the classroom, the teachers can use gadgets like laptops and projectors while conducting the classroom presentation. This will not only be a benefit to the teachers alone but also the learners will develop some ICT related skills in the classroom environment.

The school leadership and stakeholders should look for alternative power supply which is very important and critical factor for the operationalization of the ICT infrastructure. Proper installation of solar energy or even purchase of generators should be put into consideration as a power backup in case of the frequent power outage. The connection of computers and even internet connectivity depends on electricity. This means that without power system, the computers will not function properly hence posing a challenge to the integration of information communication technology in the school environment. This means that electricity is not so much dependable and schools should go for other source of power like solar machines in order to effectively integrate ICT in their schools since the computers and servers depend on power supply for its function ability. It also explains why a big most of schools are reluctant to put ICT infrastructure in place.

The government should also come up with ways of offering reliable internet connection to the primary schools since it is almost impossible for the teachers to log into online platform for academic purposes. This is due to the fact that there is poor internet connection the area. It is also clear that ICT integration in the various public schools in Makindu Sub County can take a bit of time before it is realized since the ICT infrastructures are not available in most of the schools.

Well trained Human resource should also be employed in the various schools in order to assist the learners and teachers in matters related to ICT. Professional ICT personnel should be made available at the schools at all times in order to help with the maintenance and operationalization of the ICT infrastructure. This is due to the fact that not all teachers and support staff in the various schools are ICT literates. Lack of such personnel might prohibit the integration of ICT into teaching and learning in schools.

School leadership influenced the integration of ICT in teaching and learning positively. It is very important for the managers of the school to come up with policies which will enable smooth integration of ICT in the current curriculum. This can only be achieved if the school leadership comes up with strategies to enable integration of ICT into learning and teaching for example by providing on job training for the teachers, conducting seminars and workshops. Such strategies encourage teachers to use ICT related skills in their classrooms. The administration should also provide the ICT infrastructure in their schools such as computers and laptops for the teachers and learners and even construct ICT laboratories as a strategy of integrating ICT into teaching and learning.

5.4 Recommendations

Based on the findings, the researcher recommends the following:

- i. Firstly, Primary school leadership should develop strategies to identify strengths and weakness of various technological resources with a view to adopting ICT in the process of teaching and learning.

- ii. Secondly, leadership structure of the various primary schools should look for sponsors, financiers and stakeholders to finance the acquisition of more ICT infrastructure such as computers and data cables. This will ensure the adequacy of computers in the schools so as to enable smooth integration of ICT in teaching and learning
- iii. Thirdly, the head teachers should ask the parents and other stake holders to help in the purchase of alternative power supply sources like generators and solar panels to curb the issue of frequent power outage.
- iv. Fourthly, teachers should be encouraged to find ways in which they can employ and use ICT in their teaching and learning methodologies. This would also be a great benefit to the pupils.
- v. Finally, Supervision of teaching in schools by the Directorate of Quality Assurance and Standards should be enhanced to make principals and teachers more accountable. This will minimize time wastage and teachers will be able to cover syllabus content on time.

5.5 Suggestions for Further Studies

- i. This study was only carried out in Makindu Sub County, it is therefore important that other studies be carried out in other Counties.
- ii. Since the study was carried out in rural setting, there is need to conduct a similar study in Town settlement so as to compare the results.
- iii. The study was based on primary school level it can also be carried out in secondary school to examine if quality of education can be influenced by ICT integration.

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APPENDICES

APPENDIX I: LETTER OF INTRODUCTION TO RESPONDENTS

University of Nairobi,
P.O. BOX 30197,
NAIROBI.

27th Aug 2019

Dear Sir/Madam

REF: **INFLUENCE OF ICT INTEGRATION ON QUALITY OF EDUCATION AT PRIMARY SCHOOLS IN MAKINDU SUBCOUNTY, KENYA**

I am a student from University of Nairobi taking a masters of Education in Administration and Planning. I am carrying out a research on the above mentioned topic. The purpose of this study is to investigate the influence of ICT integration on quality of education at primary schools in Makindu sub county, Makueni, Kenya

Kindly respond to the questionnaire given as correctly and honestly as possible. Be assured that your identity and response will be treated with utmost confidentiality and used for purpose of this study only. For this reason, do not write your name on the questionnaire.

I look forward to your assistance and cooperation. Thank you.

Yours sincerely

Mwakavi Brenda Mbithe

APPENDIX 2: RESEARCH QUESTIONS FOR TEACHERS

This questionnaire consists of six parts, please answer them honestly. Information provided will be treated with confidentiality.

SECTION 1: DEMOGRAPHIC CHARACTERISTICS

1. Kindly indicate your gender

Male

Female

2. In which age bracket do you fall?

23-29 years

40-49 years

30-39 years

50-59 years

3. Highest Level of Education/Professional qualification

Masters

Certificate

Degree

Diploma

SECTION 2: TEACHERS' PERCEPTION TOWARDS ICT

This section invites you to offer your views on a range of issues concerning IT. Tick the description that closely matches your experience 1- strongly agree; 2- agree; 3- unable to respond, 4- disagree; 5- strongly disagree

Issue	1	2	3	4	5
1. The use of the computer will allow me to develop my Teaching					

2. The impact of ICT integration on students' learning is Negligible					
3. Getting to know integration of ICT in curriculum implementation takes up too much of teacher's time					
4. ICT integration imposes excessive demands on teachers					
5. The use of ICT interferes with other aspects of my work					
6. ICT enables teachers to help curriculum areas outside their Own					
7. The school as a whole benefits from the introduction of ICT					
8. Integration of ICT in curriculum implementation is effective in developing learners' knowledge and skills					

SECTION 3: AVAILABILITY OF ICT INFRASTRUCTURE

- Does your school have computers? Yes No
- If yes, what types of computers are available?
 Desktop Computers
 Laptops
- How many of each of the computer types you have indicated above are Available? _____
- Does your school have internet connection? Yes No
- Is the school connected to electricity? Yes No

If YES above, how can you rate power outage (loss of power) in your school against;

- | | | | |
|-----------|--------------------------|-------|--------------------------|
| Always | <input type="checkbox"/> | Often | <input type="checkbox"/> |
| Sometimes | <input type="checkbox"/> | Never | <input type="checkbox"/> |

SECTION 4: AVAILABILITY OF HUMAN RESOURCE

1. Have you received any ICT training? Yes No

If yes, describe your level of computer literacy

2. Do you use the internet to prepare teaching and learning materials?
 Yes No

3. Where do you mainly access the internet?(check using (√) where appropriate
 At school [] Via mobile phone [] Using a Modem [] At home []
 Cyber café [] Any other form indicate.....

SECTION 5: INTEGRATION OF ICT ON QUALITY OF EDUCATION

On a scale of 1- 4 (where 1 = **Never**; 2 = **rarely**; 3 = **Regularly**; 4 = **Very regularly**) Please rate how often you the ICT facilities/infrastructure available in the school for the following purpose.

Purpose	1	2	3	4
1. Improving learner performance				
2. Improving the learners motivation and success				
3. Improving the employability of graduates				
4. Providing learners with basic survival skills				
5. Providing better learning environment				

SECTION 6: SCHOOL LEADERSHIP ON INTEGRATION OF ICT

On a scale of 1- 4 (where 1 = **Never**; 2 = **rarely**; 3 = **Regularly**; 4 = **Very regularly**) Please rate how the school leadership fairs in the school on the following aspects.

Purpose	1	2	3	4
1. The head teacher is supportive in the use of ICT integration in teaching and learning				
2. The ICT tools are accessible for use when needed				
3. The school management encourages teachers to participate in learning opportunities in ICT				
4. In this school, ICT materials are provided for use in the classrooms				
5. In this school, there are strategies for teachers to use of ICT in teaching and learning				

THANK YOU

APPENDIX 3: INTERVIEW GUIDES FOR THE HEADTEACHERS

Introduction

I would like to take about 45 minutes of your time to ask you a few questions related to ICT integration in teaching and learning in your school. Note that any information you give with respect to this request shall be treated with strict confidentiality and will only be used for the purpose of this research only. Do you have any question or any need any clarification? If you will allow me, I would like to as you the following questions:

1. Does your school have computers? If yes, what types of computers are available and how many in each case?

.....

2. Is the available ICT infrastructure adequate for ICT integration in teaching and learning in your school? Please explain your answer.

.....

.....

3. Do teachers in your school use the available ICT infrastructure? If yes, how often do they use the infrastructure and for what purposes?

.....

.....

4. Briefly describe if teachers' use of the ICT infrastructure has influence on ICT integration

.....

5. How would you describe the level of ICT knowledge among you teaching staff? How does this knowledge affect ICT integration your school

.....
.....

6. Briefly describe the perception of your teaching staff towards ICT. Would you say teachers' perception affect ICT integration in your school? How?

.....
.....


7. Do you think primary schools have adequate funding to purchase ICT equipment?


.....

8. Does ICT integration has any influence on quality of education? Please explain your answer.

.....
.....


APPENDIX 4: NACOSTI RESEARCH PERMIT


REPUBLIC OF KENYA


**NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION**

Ref No: **467464** Date of Issue: **03/February/2020**


RESEARCH LICENSE




This is to Certify that Miss. Brenda Mwakavi of University of Nairobi, has been licensed to conduct research in Makueni on the topic: Implementation of information and communication technology integration on quality of education at primary schools in makindu subcounty, Kenya for the period ending : 03/February/2021.

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APPENDIX 6: UNIVERSITY INTRODUCTION LETTER



UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION AND EXTERNAL STUDIES
SCHOOL OF EDUCATION
DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND PLANNING

Telegram: "CEES"
Telephone: 020-2701902
dept-edadmin@uonbi.ac.ke

P.O. BOX 30197 – 00100 NRB
OR P.O. BOX 92 -00902
KIKUYU

October 17, 2019

OUR REF: UON/CEES/SOE/A&P/1/4

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: BRENDA MBITHE MWAKAVI – REG NO. E55/80429/2015

This is to confirm that **Brenda Mbithe Mwakavi** is a Master of Education Student in the Department of Educational Administration and Planning of the University of Nairobi. She has successfully defended her research proposal entitled "**Implementation of Information and Communication Technology Integration on Quality of Education at Primary Schools in Makindu Sub- County, Kenya**" and is expected to go to field to collect data. Her area of specialization is Educational Planning.

Any assistance accorded to her will be highly appreciated.

Yours Faithfully,

IBRAHIM W. KHATETE
Ag. CHAIRMAN
DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND PLANNING



JMK/gm