

**FACTORS INFLUENCING INTEGRATION OF INFORMATION
COMMUNICATION TECHNOLOGY IN MANAGEMENT OF PUBLIC
SECONDARY SCHOOLS IN KIKUYU SUB COUNTY, KENYA**

By

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Award of Degree of Master of Education in Educational Administration University
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DECLARATION

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

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DEDICATION

To my family, I know it was difficult but you took the pain of supporting and encouraging me in this study.

God bless you.

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LIST OF ABBREVIATIONS AND ACRONYMS

D/HT	Deputy Headteacher
DEO	District Education Officer
HoD	Head of Department
HT	Headteacher
ICT	Information Communication Technology
MoE	Ministry of Education
PTA	Parents' Teachers' Association
TSC	Teachers Service Commission

ABSTRACT

The purpose of the study was to investigate the factors influencing integration of Information Communication Technology (ICT) in management of public secondary schools in Kikuyu Sub County, Kenya. The study was guided by four research objectives. The study adopted a descriptive research design which provided a qualitative description of trends, attitudes and perceptions of the population. The target population was 20 public secondary in Kikuyu sub-county. The study found out that principals, deputy principals and head of department had undergone training related to ICT management as indicated by majority of the principals, deputy principals and head of department. Majority of principals strongly agreed that computer training improved management while they also strongly agreed that teacher training should include instructional application of computers. The principals indicated that they used internets and computers every day and also indicated that they used printers while they never used fax facility, however the system software were expensive. It was found that teacher's resistance to change concerning the use of new strategies and isolation from other people during management was not a challenge. It was also found out that funding for ICT training has led to over-reliance on external donor funding as indicated by majority of head of department. Based on the findings of the study, it was concluded that teachers in secondary schools had undergone training related to ICT management. It was also concluded that availability of technologies assist in school management, resistance to change concerning the use of new strategies was not an obstacle to ICT integration in schools, government was still one of the key agencies that funds ICT human resource development in schools and lastly funding for ICT training has led to over- reliance on external donor funding. Schools lacked levy for ICT service in the school and they experienced high cost of technology. Based on the findings the researcher recommended that educational planners and administrators need to have adequate and accurate data using Information Technology of school personnel including academic and non-academic staff and school records for effective planning and management of schools with adequate technical support and maintenance of Information Systems.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The use of computers and technology today has become fundamental to the operation of organizations and society (Kroeker, 2010; Yonck, 2010). Globally, Information Communication and Technology is becoming increasingly used in schools and educational institutions, and established in professional and classroom practice. Applications of ICT in organizations have opened up new possibilities for running and managing organizations and for communication within the organizations (Robson 1997). Information and communication technologies enable data to be captured, stored, processed, analyzed and manipulated more efficiently and quickly.

Information Communication and Technology has been cited as encompassing potential innovations within organizations by enabling the use and sharing of information. The benefits of ICT in organizations include the potential to reshape and reformulate organizations internally and their interactions with other organizations and individuals within the networks in which they lay (Burt and Taylor, 2000). Networks also offer to corporations the opportunity to engage in organizational learning and knowledge management (Castells, 1996) due to the ability to store, retrieve, calculate, and reformulate information (McLoughlin, 1999).

Information Communication and Technology is a field of work and study that includes technologies such as desktop and laptop computers, software, peripherals, and

connections to the Internet that are intended to fulfil information processing and communications functions (Statistics Canada, 2008). Another definition for ICT comes from UNESCO, which states ICT is “the combination of informatics technology with other related technologies specifically communication technology” (UNESCO, 2002). Thus, ICT uses the newest technologies to process and communicate information.

Information Communication and Technologies are making dynamic changes in society. They are influencing all aspects of life. The influences are felt more and more at schools. Because ICTs provide both students and teachers with more opportunities in adapting learning and teaching to individual needs, society is, forcing schools to aptly respond to this technical innovation. Tinio (2002), states the potentials of ICTs in increasing access and improving relevance and quality of education in developing countries. Tinio further states the potentials of ICT as greatly facilitating the acquisition and absorption of knowledge and offering developing countries unprecedented opportunities to enhance educational systems.

Technology integration is the incorporation of technology resources and technology-based practices into the daily routines, work, and management of schools. Technology resources are computers and specialized software, network-based communication systems, and other equipment and infrastructure. Practices include collaborative work and communication, Internet-based research, remote access to instrumentation, network-based transmission and retrieval of data, and other methods. This definition is not in itself

sufficient to describe successful integration. It is important that integration be routine, seamless, and both efficient and effective in supporting school goals and purposes.

Integrating technology is what comes next after making the technology available and accessible. It is a goal-in-process, not an end state. Meeting perfect technology integration is inherently unreachable since technologies change and develop students and teachers come and go. It is the process by which people and their institutional setting adapt to the technology that matters most. The process of technology integration is one of continuous change, learning, and (hopefully) improvement. Developing a culture that embraces technology is also important to its successful integration; for example, sending important messages by e-mail, or encouraging staff to use electronic calendars to schedule meetings. This fosters a culture that accepts technology as "natural" to the business of everyday work.

Information Communication and Technology has a wide area of application in the management of various systems in the learning institutions which include; a) student management system, student profiling systems, library management information system, financial management information system and stores management information system. When these systems are combined they form an integrated ICT management. ICT enable data to be captured, stored, processed, analyzed and manipulated more efficiently and quickly. The information produced by the modern systems can be communicated by various means, instantaneously if required both within the organization and to other computers around the world.

Change has been happening at an uneven pace in any growth-oriented industry, and the education sector is no exception. Rapid growth in the field of education has made governance in academic sector a very complex task. The 21st century has witnessed tremendous advancements in technology which has led to far-reaching developments in the administrative system. Cost-effective technology combined with the flexibility in learning and administrative activities is essential to enhance efficiency. Computers can be used extensively for educational administration. According to Ben-Zion (1995) some of the areas where computers can be used for effective educational administration include: general administration, pay roll and financial accounting, administration of student data, inventory management, personnel records maintenance and library system.

In developed countries like USA and Britain schools have well managed and functional information system that provide reliable, accurate and timely information. The information is widely communicated and available to the public. Wright (2000) observed that in Singapore the management activities at schools level include maintaining student records, school level examination administration, scheduling classes, management of school facilities, equipments and library resources and management of teaching and administrative staff. These management roles are performed by the Headteacher assisted by the Deputy. The management of academic content within the curriculum set by the ministry of education is performed by the heads of departments.

Information Communication and Technology has become an important tool in modern management of learning institutions. This is because information is a critical tool in

facilitating management decisions and therefore, ICT is seen to be a crucial tool to help in facilitating acquisition of this information required in management decisions for educational institutions. This is due to the fact that accurate and timely data is a critical resource in planning and decision making (Acosta, 2004). Most of organizations endeavor to employ Information Communication Technology as a tool for competitive advantage for the accomplishment of the objective of organization as well as enhance the alignment between ICT and management strategy. (Mohammed, 2010). For competitive advantage, ICT has been leveraged to improved service and lower the cost of conducting strategic management functions.

There are many advantages in the use of ICT in the modern world. Information Communication and Technology has transformed the world into a global village. Wright (2000) stated that many countries have made good progress in terms of computerization which has enabled them to produce more reliable and current educational statistics. Information Communication and Technology integration in school management is an important issue, since senior managers in schools have a major impact upon classroom and curriculum practices, and that the use of ICT within schools is permeating aspects of school practice to the extent that it will impact upon the practice of all staff, both teaching and non-teaching.

Despite this progress there is still a very ambivalent attitude towards the use of technology for management of education institutions and systems. However, head teachers continue to take increasing interest in the scope of this field. Some of the reasons

given by Chapman (1990) for resistance to implementation of EMIS include; feelings by the management that EMIS creates extra work, increases accountability, transparent limits patronage and that Political instability may arise over unfavorable outcomes. Nwosu (2003), observes that ICT inventory in school management can enable the managements to function more effectively and efficiently and hence lead to long-term strategic plans during their management processes.

1.2 Statement of the Problem

Kenya promulgated a National ICT Policy in January 2006 giving priority to ICT. This provided the basis for the Ministry of Education to develop its sector policy on ICT in Education and in June 2006, the Ministry introduced the National ICT Strategy for Education and Training. (Ministry of Information and Communications,2006). The Government of Kenya is keen to utilize ICT and other resources to increase access to education for all Kenyans. The ICT policy required standards to be developed for hardware, software, and training, which considers the use of refurbished computers in schools and provides additional guidance as appropriate.

Ogutu (2008) on the impact of ICT integration in education in the six (6) NEPAD E-schools in Kenya revealed that both students and teachers have developed a positive attitude towards the use of ICTs and related accessories in the teaching/learning process. Wachiye (2012) did a study on factors influencing implementation of Information Communication Technology in public secondary schools.

However, no study has been done on the information Communication Technology integration in relation to management of public secondary schools in Kikuyu Sub County. This study therefore sought to address the gap by investigating Information Technology Integration in the management of public secondary schools in Kikuyu Sub County.

1.3 Purpose of the Study

The purpose of this study was to investigate the factors influencing integration of Information Communication Technology (ICT) in management of public secondary schools in Kikuyu Sub County, Kenya.

1.4 Objectives for the Study

The study was guided by the following research objectives:

- i. To examine the extent to which personnel competency influence the integration of ICT in management of public secondary schools in Kikuyu sub county, Kenya
- ii. To establish the extent to which availability of ICT infrastructure influence the integration of ICT in management of public secondary schools in Kikuyu sub county, Kenya
- iii. To assess the influence of users attitudes on the integration of ICT in management of public secondary schools in Kikuyu sub county, Kenya
- iv. To determine the extent to which financial resources influence the integration of ICT in management of public secondary schools in Kikuyu sub county, Kenya

1.5 Research Questions

The study sought information to address the following questions;

- i. To what extent did personnel competency influence the integration of ICT in management of public secondary schools in Kikuyu sub county, Kenya?
- ii. To what extent does availability of ICT facilities influence the integration of ICT in management of public secondary schools in Kikuyu sub county, Kenya?
- iii. To what extent do attitudes of users on the integration of ICT in management of public secondary schools in Kikuyu sub county, Kenya?
- iv. To what extent does financial resources influence the integration of ICT in management of public secondary schools in Kikuyu sub county, Kenya?

1.6: Significance of the Study

The study was envisaged to contribute towards greater realization of the need to resolve the perennial problems inherent in slow and error prone data collection and processing in Educational institutions; The results of the study may assist the management on better insight on how management Information Systems (MIS) can be used to produce reliable, timely information for planning, controlling and Decision making in secondary schools.

Furthermore the result may give the possible challenges schools face in integrating ICT into school administration which could be of interest to education agencies and stakeholders among them County Education Boards (CEB), Teachers Service Commission (TSC), Kenya National Examination Council (KNEC), Students, Teachers, head teachers, Board of Management (BOM) and Parents Teachers Association (PTA).

1.7 Limitations of the Study

One of the limitations of the study was that it was difficult to control the attitudes of the respondents as they may give socially biased answers to please the researcher. These limitations were addressed by requesting the respondents to be truthful as they respond to the instruments. It was challenging to get records from the schools on cases of enrollment and school attendance.

1.8 Delimitations of the Study

The study was conducted within a period of six months in eight public secondary schools in Kikuyu district since covering all schools was difficult due to the wider geographical area. The study was delimited to the head teachers and deputy head teachers since they are concerned with administration. Private schools were not included in the study because they have different management procedures from their public counterparts and this would have influence on their responses.

1.9 Definitions of Significant Terms

The following are the definitions of the significant terms

Attitudes refers to perceptions or feelings towards the use of information and communication Technology.

Constraint refers to factors or issues which limit full exploitation of information and communication Technology resources or facilities for improved management of schools.

Expertise refers to the endowment of skills in handling information and communication Technology.

Financial resources refers to the money used to purchase, maintain or pay for information and communication Technology related costs

ICT infrastructure refers to the gadgets, machines that comprise information and communication Technology.

ICT Integration refers to incorporating/Mainstreaming the usage of information and communication Technology in the management of school.

Management refers to the control and operation of school programs or activities to achieve its objectives.

Software refers to any set of machine-readable instructions that directs a computer's processor to perform specific operations.

Training refers to technical knowledge that has been imparted on the people dealing with information and communication Technology in schools.

1.10 Organization of the Study

The study is organized into five chapters. Chapter one comprises of background to the study, statement of the problem, purpose and objectives of the study, research questions, significance of the study, limitations of the study and delimitations of the study, basic assumptions of the study, definitions of significant terms and organization of the study . Chapter two consist of the concept of usage of ICT on management of schools, influence of personnel training and expertise on the integration of ICT in management of schools, availability of ICT infrastructure and integration of ICT in management of schools, user attitudes towards ICT use and integration of ICT in management of schools and the influence of financial resources on integration of ICT in management of schools. Lastly

the section presents the theoretical and conceptual framework of the study. Chapter three consists of the research methodology divided into: research design, target population, sample size and sampling procedures, research instrument, reliability of the instrument and validity of the instruments, data collection procedures and data analysis techniques and ethical considerations. Chapter four covers data analysis and presentation. Chapter five comprise of the summary of the study, conclusions, recommendations and suggestions for further research.

CHAPTER TWO

RELATED LITERATURE REVIEWED

2.1 Introduction

This section presents the literature review of the study. The section presents the usage of ICT in schools, influence of personnel competency ICT management, infrastructure availability, user attitudes towards use of ICT and the theoretical framework.

2.2 Usage of ICT on Management of Schools

Computers are spreading rapidly in schools not just in wealthy countries, but increasingly in developing ones as well (Wolff, 1999). Wolff further notes that although schools have had computers in classrooms for almost two decades, ways to use them effectively have evolved slowly and patchily. Wolff argues that Schools use ICTs in two main ways: for administration and routine tasks of classroom management, and for instruction. In the classroom, they have two main instructional roles: for teaching ICT skills and as a tool for teaching other subjects. Wolff, (1999) noted that the most incontrovertible benefit of computers in schools has been in easing administrative chores. He cites that teachers no longer need to pass round bundles of end-of-term reports in paper envelopes, but can fill them in on screen and often deliver them safely to parents online. Data on students' attendance and performance can be more easily recorded and analyzed. The use of ICTs for administration of schools in developed countries and routine tasks of classroom management seems to have developed just as quickly, or quicker, than their use in instruction (Cassandra, 2000).

Okebukola (1996), administrative functions in schools are becoming increasingly complex in terms of enrolments, population mobility and social problems. Okebukola further notes that this complexity requires the use of powerful administrative tools resulting in better communication, efficient operations and better personal services. Okebukola suggests that this increasing changes can be managed though usage of ICT and therefore calls for ICT integration in management of secondary schools (Nwosu, 2003). Nwosu observes that new innovative technologies can help schools' improve the quality of administrative activities and processes. He further argues that ICT can be extensively used to automate and mechanize work such as human resource management, financial management, monitoring and evaluation, the processing of student and teacher records, communication between government and schools, lesson planning, assessment and testing, financial management, and the maintenance of inventories.

Commenting on the relevance of data in the educational system Nwagwu (1995) argued that effective record keeping is vital to educational development and management. In addition, he emphasizes that, it will be an impossible task to plan and administer any institution in which records are not kept or are carelessly and fraudulently kept. Adeyemi and Olaleye (2010), observed that the educational planners and administrators need to have adequate and accurate data of student enrolment, school personnel including academic and non-academic staff and school records for effective planning and management of schools. They noted that the utilization of ICT in everyday activities of the school cannot be over-estimated. Nwosu (2003) noted that ICT assists the school administrator to meet the task of school management in the areas of curriculum and

instruction, school community relationship and school business operations. In support of this Mohammed (2006) argued that the introduction of ICT in schools enhances the daily school routine, programme, updating the evaluation of school programmes, solving individuals' or groups' as well as staff development.

Lucey (2005) noted that ICT helps to support management in their key tasks of planning, decision making, organizing, coordination and control. Batley (2007), points out that all organizations whatever sector they are in, want to be more-efficient and cost effective, and a good, user centered information system ,focusing on individual and organizational needs, can improve information and knowledge sharing and lead to better service delivery. A good information management system should take into account needs of the whole organization, the information needs of various departments within the organization and the specific needs of individuals within the organization.

2.3 Influence of Personnel Competency on the Integration of ICT in Management of Schools

Many countries globally, lack adequate human capacity in ICT and this is even more critical in African countries (Waibodhi, 2002) and in China where there is a shortage of ICT-skilled people (Pernia, 2008:7). Waema (2002) raises doubts about the skills of personnel in ICT literacy training in the education sector, where, for example in Kenya, schools employ poorly trained ICT staff. He further observes: In Kenya, for example, most of the high-end ICT training takes place in public institutions, but these institutions lose staff to the private sector who offers better salaries. The consequence of the high

staff turnover is over-reliance on part-time and less qualified lecturers with its attendant quality implications. Schools are more prepared to recruit staff that are already trained rather than less qualified persons who can be trained, possibly due to inadequate funds or lack of awareness on the strategic importance of well-trained manpower.

Inadequate technical support and maintenance is another issue that may affect the integration of ICT in the management of schools. The level and quality of technical support is very important in maintaining the confidence of educators in the reliability of access to equipment and software (Towers & Oliver, 2000). They also observe that the level of ICT literacy of an individual is consequently affected because it is assumed that the availability of qualified technical staff impacts on ICT appreciation of administrators of educational institutions. This section of the study has discussed possible challenges that face ICT literacy development in Kenya and other countries. The next section considers various strategies that can enhance ICT literacy development.

Information Communication and Technology human capacity development is an important strategy in enhancing ICT use in educational leadership and efforts to expand capacity for ICT education (Waibodhi, 2002). He adds that the abundance of ICT professionals in Africa may, with the right policy instruments, attract foreign investment for the industry as it has done in several Asian countries. Odzen (2007), sites the lack of effective training as a challenge to the ICT integration. Research in turkey found that the main challenge with ICT implementation was insufficient amount of in- service training programs (Odzen, 2007). Becta (2004), the issue of training is complex because it is

important to consider several components to ensure the effectiveness of the training. Providing pedagogical training is important rather than training them to use ICT as an important issue (Gomez 2005).

2.4 Availability of ICT Infrastructure and Integration of ICT in Management of Schools

Insufficient access to computers is one of the main obstacles to the spread of ICT usage in school education. This is more so in the case of rural areas where the school is often the only access point for computers. According to Adeyemi and Olaleye (2010) ICT tools like computer, internets and other telecommunication technologies that can aid teaching or learning management are hardly used or not available in many public secondary schools. Moreover, system software is expensive and prone to upgrades and requires resources put aside for new versions and upgrades. Operating System (OS) itself adds to the cost burden of the hardware. Although this will require massive investments in the infrastructure, it is nevertheless essential in order to guarantee equal access and to overcome the digital divide. Strong, sustainable partnerships between the Government, private sector and civil society must be built to offset costs and mitigate the complexities of the integration of ICT in education.

Adeyemi and Olaleye (2010), noted that there is low level usage of ICT in management of public schools. They further argued that intermittent disruption of equipment may not be unconnected with the shortage of such equipment in the schools. They argued that ICT equipment such as television for visual and educational programme, Satellite disc for

distance viewing of foreign programmes and Radio cassette for audio and educational purposes are not used in most of the schools. Seiden, (2000) observes that the usage of ICT equipment in the schools in developing countries is at a low level. Uhaegbu (2001) concurs that the level of usage and integration of ICT equipment and facilities in secondary schools is low.

The ICT options paper in Kenya indicates that one of the main challenges facing ICT literacy development is limited access and the degree of disparity in infrastructure, especially electricity and telecommunications that exists between rural and urban areas (MoE, 2005: 12). The report continues that getting computers into schools is relatively easy; keeping them working is a greater challenge. A myriad of problems ranging from electrical spikes, to viruses, dust, heat, and normal wear and tear can bring activity in a developing country computer lab to a screeching halt. Pernia (2008:10) reports that South Korea's problems in ICT literacy development revolve around issues of ICT infrastructure maintenance and best usage of ICT facilities like selection of what should be transmitted on the information superhighway.

Availability of adequate infrastructure to support the deployment of ICTs in schools is a tremendous challenge that schools in Kikuyu currently face. Apart from the high initial cost of purchasing and setting up the requisite infrastructure, the maintenance and upgrade costs, as well as the cost and effort of supporting such infrastructure are also roadblocks to the successful usage of ICTs in schools, especially in poor and remote areas (Odzen, 2007). Given the current budgetary and resource constraints of various

Governments, a widespread investment in ICTs in education is probably not possible in most developing countries (Magni 2009). It is, therefore, critically important to better understand the cost-benefit equation of the wide range of ICT options and uses in order to effectively target-spend the scarce resources. In most of schools in the subcontinent, the teachers are overloaded, less motivated and inadequately trained, and often deal with inconvenient working conditions. The use of ICTs in the classroom or in distance education does not diminish the role of the teacher; neither does it automatically change teaching practices. In such an atmosphere, building the capacity of teachers so that they are equipped to deal with using ICTs in classrooms is a challenge.

2.5 User Attitudes Towards ICT use and Integration of ICT in Management of Schools

Markauskaite (2005) notes that the intensity of ICT appreciation and use is directly influenced by individuals' attitudes. Reflecting a higher level of ICT literacy than the knowledge or skills dimensions, the attitude dimension represents the product and process of a person's critical assessment of the use of ICT for information and knowledge (Pernia, 2008). In order to consider the attitude dimension towards ICT, opinion on, interest in, the challenges and strategies of ICT literacy development should be considered, (Selwood, fung and mahogany 2003). Waibodhi (2002), argues that administrators may sometimes show resistance to technological change. In this study, this attitude dimension is considered by investigating s' attitude towards ICT as a challenge they face in an attempt to be ICT literate.

Shcoepp (2005) points out that attitude and resistance to change is a major challenge in the ICT integration. The same observation is made by Becta (2004) who argues that this is an important barrier to the ICT integration in the management of schools. Resistance is commonly witnessed while attempting to introduce ICTs into schools, very often from the teachers themselves, since they may be of the opinion that they shall become redundant once technology comes in or due to their perception that it is too late for them to adapt to a new environment. Gomez (2005) argued that science teachers' resistance to change concerning the use of new strategies is an obstacle to ICT integration. Educators themselves may be skeptical about the effectiveness of using ICTs in school management. Watson (1999) argued that integrating the new technologies in the educational setting requires change and different teachers will handle this change differently. According to him, considering teachers attitude is important. According to Empirica (2006), teachers who are not using new technology are still of the opinion that the use of ICT has no benefit or unclear benefits

2.6 Financial Resources and Integration of ICT in Management

Waema (2002:6) points out that duties and taxes are levied on ICT products while value-added tax (VAT) is levied on ICT services, making both expensive. Although many governments raise revenue through taxes, the investment in ICT literacy of school leaders in Kenya is minimal. He adds that at the same time, many public tertiary institutions charge market rates for all forms of training, including ICT, thus making the training unaffordable to most people. He also observes that the Kenya government is still one of

the key agencies that funds ICT human resource development, making ICT literacy training a difficult task.

Waibodhi (2002) supports these views that in public sectors of most countries, lack of funding for ICT training has led to over-reliance on external donor funding. At the secondary school level there is inadequate government funding for ICT training of education administrators likes. He further notes that non-competitive telecommunications infrastructure, policies and regulations impede connectivity and sustainability. While there are computers in schools, ICT use is in its infancy stage due to the high cost of technology, uneven access to such facilities and limited connectivity (Pernia, 2008). She adds that in China for instance, the government has been giving much attention to the introduction and integration of ICT application in the education system. However, the efforts face challenges due to financial difficulties of providing ICT facilities. Selwood (2003) feel that expenditure on ICT resources should be significant and continuous.

2.7 Summary of Related Literature Reviewed

Review of literature has established that inadequate human capacity in ICT has had an influence of ICT integration (Waibodhi, 2002). Waema (2002) has also shown that skills personnel in ICT literacy training have an influence of ICT integration. Odzen (2007) has also shown that the ICT training as a challenge to the ICT integration.

Adeyemi and Olaleye (2010) have shown the importance of ICT infrastructure. They have also shown that availability of adequate infrastructure to support the deployment of ICTs in schools is a tremendous challenge that schools in the region currently face.

Markauskaite (2005); Pernia (2008); Selwood, fung and mahogany (2003) and Waibodhi (2002) have established the effects of attitude on ICT integration. This has been shown by resistance to change which has an impact on ICT integration.

Waibodhi (2002); Pernia (2008) and Selwood, fung and mahogany (2003), have shown the importance of financial resources on ICT integration. These studies have been conducted in other spheres of life hence the current study focused on public secondary schools in Kikuyu sub-county.

Technology acceptance theory has been used to explain adoption technology adoption, however the theory has been criticized for not being able to be all inclusive leading to new theories like modified Technology acceptance, method. However the theory has been applauded for being able to provide tested variables that can be applied in diverse environment like in secondary schools, which was a motivation for its use in the current study.

2.8 Theoretical Framework

Nachmias and Nachmias (1996) defined theoretical framework as representation of reality; it delineates those aspects (variables) of the real world the scientist considers to be relevant to the problem investigated and makes explicit the significant relationship among those variables. The study was based on The Technology Acceptance theory. The Technology Acceptance Theory suggests that when a user is presented with a new technology, a number of factors influence their decision regarding how and when they

will use it. This includes its perceived usefulness, ease of use, external variables and intention/attitudes of users (Cloete and Courtney, 2002).

However, other factors such as personal control, economic factors, outside influences from suppliers, customers and competitors are not considered by the Technology Acceptance Model (van Akkeren and Cavaye, 1999). The theory is applicable to the study since it will show the factors influencing integration of Information Communication Technology (ICT) in management.

2.9 Conceptual framework

The conceptual framework of the study is presented in figure 2.1.

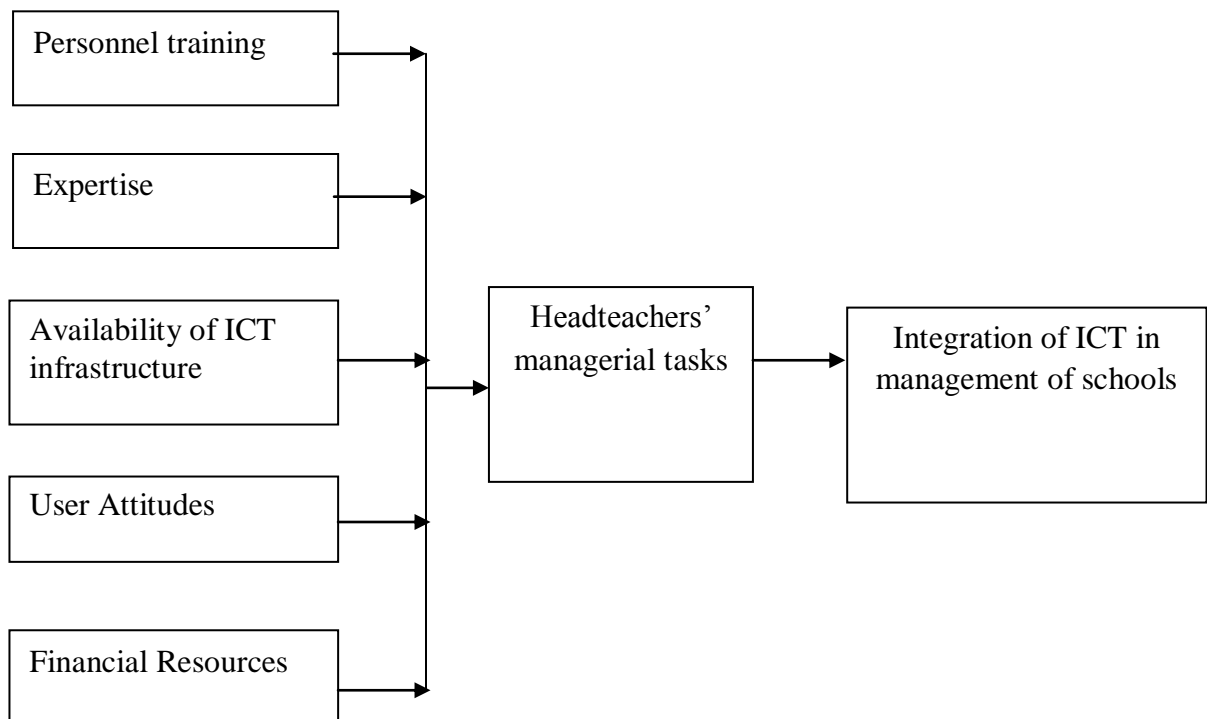


Figure 2.1 Relationship Between Factors Influencing ICT Integration in Management of Public Secondary Schools.

The framework shows that integration of ICT in the management of schools is influenced by different factors which are personnel training and expertise, availability of ICT infrastructure, user attitudes and financial resources. These are the independent variables. Relating the independent variables to the dependent variables imply that when the personnel have the necessary skills and expertise in ICT, they will enhance the integration of ICT. Further, when the necessary ICT infrastructure is available in schools this will also facilitate ICT integration in school management. Attitudes of the users have also been seen as an important component in the integration of ICT in school management. When the users have a positive attitude towards ICT use, ICT will effectively be integrated in school management and finally ICT integration requires financial resources. With adequate financial resources, necessary ICT facilities will be sought and hence effective integration of ICT in school management.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research design and target population, sample size and the sampling, research instruments, validity of the instrument and reliability of the instrument data collection procedures and data analysis techniques and ethical considerations.

3.2 Research design

In this study descriptive survey research design was adopted. This design is appropriate because it was less expensive and can enable the researcher to examine data from a wider area within a short time (Gatara, 2010). A descriptive survey design provides qualitative or numeric descriptions of trends, attitudes and perceptions of the population by studying a sample of that population (Kothari, 2008; Best & Khan, 2003). Since this study is only interested in determining the influence of the independent variable on the dependent variable without manipulating any variable, the research design is suitable since it focuses on the current phenomenon in regard to information communication and technology integration in management of public secondary schools.

3.3 Target population

The target population was 20 public secondary in Kikuyu Sub County which included 15 sub county schools, four county schools and one National school. The target population was therefore 20 headteachers, and 20 deputy headteachers and 100 Heads of Departments as shown in Table 3.1.

Table 3.1: Target Population

Target Schools		Target Respondents	
population	No. of schools	Respondents	No. Targeted
County secondary schools	15	head teachers	20
Sub county secondary schools	4	Deputy head teachers	20
National schools	1	Heads of departments	100

3.4 Sample Size and Sampling Procedures

According to Orodho, (2010), sampling is the process of selecting units from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen. Since the scope of the study was not wide that is all the 20 were picked for the study. The sample size was therefore 20 headteachers and 20 deputy headteachers and 100 heads of departments selected by census.

3.5 Data Collection Instruments

The study used questionnaire in order to collect data. Orodho, (2010) defines a questionnaire as a method for the elicitation, recording and collecting of information. There were two sets of questionnaires; one for the headteachers and the other for the deputy headteachers. The headteachers', deputy headteachers and the Hod questionnaire comprised of five sections.

Section A comprised of items on the bio data; section B had items on personnel training and expertise and the integration of ICT in management of public secondary schools, section C had items on availability of ICT infrastructure and the integration of ICT in management of public secondary schools, part D had items on user attitudes and the

integration of ICT in management of public secondary while section E had items on financial resources and the integration of ICT in management of public secondary schools. The study also employed an observation checklist to assess the availability and adequacy of ICT infrastructure.

3.6 Piloting

The researcher randomly selected four schools from the category for pre-testing. He administered the questionnaire to the Headteacher, Deputy Headteacher and Heads of Departments. This was done to detect any weaknesses in the questionnaire before the data collection process. It enforced the validity of the questionnaire and assessed time and other requirements.

3.7 Validity of the Instruments

According to Orodho, validity should be concerned with establishing whether the questionnaire content measure what they are supposed to measure. In this study content validity was used to establish the validity of the instruments. Expert judgement from the supervisors from the department of Educational Administration and Planning was sought (Mugenda & Mugenda, 2003). They assessed the relevance of the content used in the questionnaire developed, and their recommendations were incorporated in the final questionnaire.

3.8 Reliability of the Instruments

Reliability is concerns the degree to which a particular measuring procedure gives similar results over a number of repeated trials (Orodho, 2010). Test-retest method was used to estimate the degree to which the same results could be obtained with a repeated measure of accuracy of the same concept in order to determine the reliability of the instrument. In the study the questionnaire was given to a few identical subjects, not the ones included in the main study. A correlation coefficient of 0.8 was considered high to judge the instrument as reliable for the study.

3.9 Data Collection Procedures

The researcher sought a research permit from the National Commission for Science, Technology and Innovation (NACOSTI). The researcher then proceeded to report to the County Commissioner and Sub county Education Officer, Kikuyu Sub County, and thereafter wrote letters to the headteachers to be allowed to do the study in their respective schools. The respondents were assured that strict confidentiality was maintained in dealing with their identities. The completed questionnaires were collected once filled out.

3.10 Data Analysis Techniques

Data analysis follows after the data has been collected. The research yield both qualitative and quantitative data from the structured and the unstructured items. Coding was done for the structured items. The analysis of the coded data was done using the Statistical Package for Social Sciences (SPSS). Quantitative and qualitative methods of

data analysis were used in which descriptive statistics like frequencies and percentages were applied to summarize quantitative data while the qualitative data was arranged into themes according to the objectives of the study.

3.11 Ethical Considerations

Due to the sensitivity of some information collected the researcher held a moral obligation to treat the information with utmost propriety. Since the respondents would be reluctant to disclose some information the researcher needs to reassure the respondents of use and confidentiality of the information given. Anonymity was observed with the respondents not being required to write their names on the questionnaire. Permission was sought from the schools and the respondents before data collection. No respondent was coerced in order to get answers.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSIONS

4.1 Introduction

Presented in this chapter is data analysis, presentation and interpretation of finding. The chapter covers response rate and findings for each objective of the study.

4.2 Response Rate

Questionnaire return is the proportion of the questionnaires returned after they have been issued to the respondents. The study targeted a total population of 20 principals/headteachers, 20 deputy principals/headteachers and 100 heads of departments from 20 secondary schools in kikuyu Sub County. The sample was selected through stratified and random sampling technique where a sample of 20 principals, 20 deputy principals and 95 departmental heads responded to the questionnaire. A total of 140 questionnaires were administered, out of which 135 were collected giving 96.4% percent response rate which was deemed adequate for data analysis. The response rates for the study is in table 4.1

Table 4.1: Questionnaire Response Rate

	Sample size	Frequency	Percentage
Principals	20	20	100%
Deputy Principals	20	20	100%
Head Of Department	100	95	95%
	140	135	96.4%

4.3 Demographic data of the Respondents

This section presents the demographic information of principals, deputy principals and head of department. Their age was considered to see if age influences acceptance of use, attitude, competence and training of the head teachers, principals and head departments. Gender of head teachers, principals and head departments was considered to see whether it has effect on acceptance of Information Communication and Technology. Experience was also considered to see whether it had any influence in the use of or lack of use of computers. Educational level of head teachers, principals and head departments was also considered to see whether it had effect on the acceptance of Technology.

4.3.1 Demographic Data of the Principals

The demographic information of the principals was based on gender, age, highest level of education and duration they had served as principals. Table 4.2 shows their gender distribution of the principals.

Table 4.2: Gender Distribution of the Principals

Gender	F	%
Male	10	50.0
Female	10	50.0
Total	20	100.0

Table 4.2 indicates that 50.0% of principals were male while the same number of principals was female. This shows fair distribution of gender of principals in the study, meaning that both genders were represented in the study. Another aspect that was

considered in the principal's bio data was the age of the respondents and the results are in Table 4.3

Table 4.3: Distribution of Principals According to Age

Age	F	%
Below 25 years	2	10.0
36-45 years	8	40.0
Over 45 years	10	50.0
Total	20	100.0

Table 4.3 shows that majority 50.0% of principals were aged over 45 years 10.0% of principals were aged below 25 years while 40.0% of principals were aged between 36 and 45 years. This shows that the principals were relatively old to and had adequate institutional memory and understand the factors influencing integration of Information Communication Technology in management of Public Secondary schools in Kikuyu Sub County. The study also considered the qualification of the respondents and the findings are shown in Table 4.4

Table 4.4: Professional Qualification of the Principals

Professional qualification	F	%
Diploma teacher	4	20.0
Bachelor education	13	65.0
Masters	3	15.0
Total	20	100.0

The results in Table 4.4 indicated that majority 65.0% of principals had bachelor education 20.0% of principals had diploma education while 15.0% of principals had masters education. This shows that the principals had required qualification to be in secondary schools. Another aspect of the study that was considered was the duration that the principals had served in their respective schools. The study analyzed the duration the principals had served in the current school and the findings are shown in Table 4.5.

Table 4.5: Years Served the Principals had Served in the Current School

Years	F	%
Less than 2 years	7	35.0
3-5 years	8	40.0
6-10 years	4	20.0
Over 10 years	1	5.0
Total	20	100.0

The findings in Table 4.5 shows that 35.0% of principals had served for less than 2 years as principals, 40.0% of principals for between 3 and 5 years, 20.0% of principals for between 6 and 10 years while 5.0% of principals had served for over 10 years as principals. This shows that principals had served for considerable number of years and hence would provide information on the factors influencing integration of Information Communication Technology in management of Public Secondary schools in Kikuyu Sub County. The study found it necessary to establish the demographic information of the deputy principals.

4.3.2 Demographic Data of the Deputy Principals

The demographic information of the deputy principals was based on gender, age, highest level of education and duration they had been in the current school. Like in the principals the study analyzed the gender of the deputy principals and the findings are shown in Table 4.6.

Table 4.6 : Gender Distribution of Deputy Principals

Gender	F	%
Male	10	50.0
Female	10	50.0
Total	20	100.0

The findings in table 4.6 show that 50% of deputy principals were male while the same numbers of deputy principals were female. This shows fair distribution of gender of the deputies in the study, hence the findings represent views of both gender.

Table 4.7: Distribution of Deputy Principals According to Age

Age	F	%
36-45 years	6	30.0
Over 45 years	14	70.0
Total	20	100.0

The results in Table 4.7 shows that majority 70.0% of deputy principals were aged over 45 years while 30.0% of deputy principals were aged between 36 and 45 years. This shows that the deputies were relative old hence would understand the factors influencing

integration of Information Communication Technology in management of Public Secondary schools in Kikuyu Sub County.

Table 4.8: Distribution of Deputy Principals According to Professional Qualification

Professional qualification	F	%
Approved Teacher (ATS)	2	10.0
Diploma teacher	1	5.0
Bachelor education	11	55.0
Masters	4	20.0
PGDED	2	10.0
Total	20	100.0

The findings in Table 4.8 show that majority 55.5% of deputy principals had bachelor education, 10.0% of deputies had Approved Teacher (ATS) professional qualification, and the same number of deputies had PGDED. Data further shows that 5.0% of deputies had diploma qualification while 20.0% of deputies had masters' professional qualification. This shows that the deputies had required qualification to serve in secondary schools. The respondents were asked to indicate the number of years they had served in the current school, deputies responded as Table 4.9

Table 4.9: Duration of the Deputy Principals in Current School

Years	F	%
Less than 2 years	9	45.0
3-5 years	4	20.0
6-10 years	4	20.0
Over 10 years	3	15.0
Total	20	100.0

The findings in Table 4.9 shows that 45.0% of deputy principals had served for less than 2 years as principals, 20.0% of deputy principals for between 3 and 5 years, 20.0% of deputy principals for between 6 and 10 years while 51.0% of deputy principals had served for over 10 years as principals. This implies that the deputies had served in secondary schools for considerable number of years and hence would understand the factors influencing integration of Information Communication Technology in management of Public Secondary schools in Kikuyu Sub County.

4.3.3 Demographic Data of the Head of Department

The demographic information of the head of department was based on gender, age, highest level of education and duration they had been in the current school. Table 4.10 shows their gender.

Table 4.10: Distribution of Head of Department According to Gender

Gender	F	%
Male	79	83.2
Female	16	16.8
Total	95	100.0

The findings in Table 4.10 show that majority 83.2% of head of department were male while 16.8% of head of department were female. This shows that male teachers were more than female teachers in the departments. Table 4.11 tabulates distribution of head of the department according to age

Table 4.11: Distribution of Head of Department According to Age

Age	F	%
26-36 years	9	9.5
36-45 years	54	56.8
Over 45 years	32	33.7
Total	20	100.0

The findings in Table 4.11 shows that majority 56.8% of head of department were aged between 36 and 45 years, 9.5% of head of department were aged between 26 and 36 years while 33.7% of head of department were aged over 45 years. This implies that the heads were relative old and hence would understand the factors influencing integration of Information Communication Technology in management of Public Secondary schools in Kikuyu Sub County.

Table 4.12: Distribution of Head of Department According to Professional Qualification

Professional qualification	F	%
Approved Teacher (ATS)	18	18.9
Diploma teacher	51	53.7
Bachelor education	17	17.9
Masters	9	9.5
Total	20	100.0

The findings in in Table 4.12 shows that majority 53.7% of head of department had diploma education, 18.9% of head of department had Approved Teacher (ATS) qualification, 17.9% of head of department had bachelor education while 9.5% of head of

department had masters education. This shows that the heads had required qualification to serve in secondary schools.

Table 4.13: Distribution of Head of Department According to Years in the Current School

Years	F	%
Less than 2 years	26	27.4
3-5 years	65	68.4
Over 10 years	4	4.2
Total	95	100.0

The findings in in table 4.13 show that majority 68.4% of head of department had been in their current school for between 3 and 5 years, 27.4% of head of department for less than 2 years while 4.2% of head of department had served in the current school for over 10 years. This implies that the head had been in secondary schools for considerable number of years and hence would understand the factors influencing integration of Information Communication Technology in management of Public Secondary schools in Kikuyu Sub County.

4.4 Personnel Competency and the Integration of ICT in Management

The purpose of this study was to establish the factors influencing integration of Information Communication Technology in management of Public Secondary schools in Kikuyu Sub County. Specifically, the study sought to establish the influence of Personnel competency to the integration of ICT in management. The result is presented in the

following section. The respondents were asked whether they had undergone any training related to ICT management, principals responded as Table 4.14

Table 4.14: Principals Responses on Whether they had Undergone any Training Related to ICT Management

Response	F	%
Yes	11	55.0
No	9	45.0
Total	20	100.0

The findings in in Table 4.14 show that majority 55.0% of principals indicated that they had undergone any training related to ICT management while 45.0% of principals had never undergone any training related to ICT management. ICT management training would help the principals in enhancing ICT use in educational leadership and efforts to expand capacity for ICT education. The study further sought to establish the training levels of the head of department and deputy principals, and the findings are in Table 4.15

Table 4.15: Deputy Principals and Head of Department Responses on whether they had Undergone any Training Related to ICT Management

Respondents	Yes		No	
	F	%	F	%
Deputy principals	15	75.0	5	25.0
Head of department	69	72.6	26	27.4

The findings in Table 4.15 show that majority 75.0% of deputy principals and majority 72.6% of head of department had undergone training related to ICT management. This implies that the teachers had high-end ICT training place in schools. The findings thus refute the findings by Odzen (2007) that lack of effective training was a challenge to ICTs integrations in schools. Likewise the respondents were asked to indicate the core theme of the training, principals responses are tabulated in Table 4.16

Table 4.16: Principals Responses on the Core Theme of the Training

Theme	F	%
Basic computer literacy, not necessarily linked to management	6	30.0
Utilization of ICT hardware and software but linked to teaching and management	3	15.0
Utilization of ICT for improving school management	2	10.0
N/A	9	45.0
Total	20	100.0

The findings in in Table 4.16 shows that 30.0% of principals indicted that the core theme of their ICT training was basic computer literacy, not necessarily linked to management, 15.0% of principals indicated that the training was on utilization of ICT hardware and software but linked to teaching and management while 10.0% of principals indicated that the training was on utilization of ICT hardware and software bur linked to teaching and management. Table 4.17 presents principals’ responses on personnel competency and the integration of ICT in management

Table 4.17: Principals' Responses on Personnel Competency and the Integration of ICT in Management

Statement	Strongly agree		Agree		Disagree		Strongly disagree	
	F	%	F	%	F	%	F	%
Computer training will improve management	16	80.0	1	5.0	3	15.0	0	0.0
Teacher training should include instructional application of computers	14	70.0	6	30.0	0	0.0	0	0.0
Training in ICT will relieve principals of management duties	3	15.0	5	25.0	3	15.0	9	45.0
My school experience shortage of ICT- skilled people	7	35.0	10	50.0	3	15.0	0	0.0
Secondary school employ poorly trained ICT staff	2	10.0	13	65.0	3	15.0	2	10.0
My school has inadequate technical support	10	50.0	7	35.0	1	5.0	2	10.0
ICT development enhance management	10	50.0	10	50.0	0	0.0	0	0.0
Lack of effective training is a challenge to the ICT integration	13	65.0	4	20.0	3	15.0	0	0.0

The Majority 80.0% of principals strongly agreed that computer training improve management, majority 70.0% of principals strongly agreed that teacher training should include instructional application of computers. The study further found out that 45.0% of principals strongly disagreed that Training in ICT relieve principals of management duties, majority 50.0% of principals agreed that their school experience shortage of ICT- skilled people and that ICT development enhance management. Majority 65.0% of principals agreed that Secondary school employ poorly trained ICT staff while the same

number of principals strongly agreed that lack of effective training is a challenge to the ICT integration. This agrees with Waema (2002) who raises doubts about the skills of personnel in ICT literacy training in the education sector and stated that schools employ poorly trained ICT staff. When deputy principals were asked to indicate the same, they responded as Table 4.18

Table 4.18: Deputy Principals’ Responses on Personnel Competency and the Integration of ICT in Management

Statement	Strongly agree		Agree		Disagree	
	F	%	F	%	F	%
Computer training will improve management	14	70.0	6	30.0	0	0.0
Teacher training should include instructional application of computers	17	85.0	3	15.0	0	0.0
Training in ICT will relieve principals of management duties	8	40.0	9	45.0	3	15.0
Secondary school employ poorly trained ICT staff	4	20.0	10	50.0	6	30.0
ICT development enhance management	11	55.0	9	45.0	0	0.0
Lack of effective training is a challenge to the ICT integration	13	65.0	6	30.0	1	5.0

The findings in in Table 4.18 show that majority 70.0% of deputy principals strongly agreed that computer training improve management, majority 85.0% of deputy principals strongly agreed that teacher training should include instructional application of computers. Data further shows that 45.0% of deputy principals agreed that training in ICT relieve principals of management duties. Majority 50.0% of deputy training agreed

that secondary school employ poorly trained ICT staff, majority 55.0% of deputy principals strongly agreed that ICT development enhance management while majority 65.0% of deputy principals strongly agreed that lack of effective training is a challenge to the ICT integration. This shows that the level and quality of technical support was very important in maintaining the confidence of educators in the reliability of access to equipment and software in the schools. The study further sought to establish the same from the head of department. Data is presented in table 4.19

Table 4.19: Head of Department Responses on Personnel Competency and the Integration of ICT in Management

Statement	Agree		Disagree	
	F	%	F	%
Computer training will improve management	91	95.8	4	4.2
Teacher training should include instructional application of computers	54	56.8	41	43.2
Training in ICT will relieve principals of management duties	79	83.2	16	16.8
Secondary school employ poorly trained ICT staff	82	86.3	13	13.7
ICT development enhance management	50	52.6	45	47.4
Lack of effective training is a challenge to the ICT integration	82	86.3	13	13.7

The findings in Table 4.19 shows that 95.8% of head of department agreed that computer training improve management, majority 56.8% of head of department agreed that teacher training should include instructional application of computers. Majority 83.2% of head of department agreed that training in ICT relieve principals of management duties, majority 86.3% of head of department agreed that secondary school employ poorly trained ICT

staff and that lack of effective training is a challenge to the ICT integration while majority 52.6% of head of department agreed that ICT development enhance management.

4.5 Availability of ICT Infrastructure and the Integration of ICT Management of Public Secondary School

The second objective of the study sought to establish the influence of availability of ICT infrastructure and the integration of ICT management of public secondary school. The results is presented in Table 4.20

Table 4.20: Principals Responses on Whether their School had Sufficient Access to Computers

Response	F	%
Yes	7	35.0
No	13	65.0
Total	20	100.0

The findings in Table 4.20 indicate that majority 65.0% of principals indicated that their school had insufficient access to computers while 35.0% of principals indicated that their school had sufficient access to computers. This implies that insufficient access to computers was one of the main obstacles to the spread of ICT usage in school education. The findings confirmed the study by Adeyemi and Olaleye(2010) that ICT tools like computers and internet and telecommunications were hardly available in many public secondary schools thus affecting integration of ICTS in teaching and learning. The

respondents were asked to indicate the frequency at which they used ICT facilities, principals responded as Table 4.21

Table 4.21: Principals Responses on the Frequency at which they used ICT Facilities

Facilities	Every day		Once or twice a week		Once or twice a Month		Never	
	F	%	F	%	F	%	F	%
Internets	11	55.0	2	10.0	4	20.0	3	15.0
Computers	11	55.0	6	30.0	0	0.0	3	15.0
Printers	12	60.0	3	15.0	0	0.0	5	25.0
Fax	0	0.0	2	10.0	5	25.0	13	65.0

The findings in indicate that majority 55.0% of principals indicated that they used internets and computers every day. Majority 60.0% of principals indicated that they used printers every day while majority 65.0% of principals indicated that they never used fax facility. This was because availability of adequate infrastructure to support the deployment of ICTs in schools was a tremendous challenge that schools in the region faced.

Table 4.22: Deputy Principal’s Responses on Whether School had Sufficient Access to Computers

Response	F	%
Yes	3	15.0
No	17	85.0
Total	20	100.0

The findings in indicates that majority 85.0% of deputy principals indicated that their school had insufficient access to computers while 15.0% of deputy principals indicated that their school had sufficient access to computers. This agrees with Adeyemi and Olaleye, (2010) who noted that there is low level usage of ICT in management of public schools. Table 4.23 tabulates principals' response on availability of ICT infrastructure and the integration of ICT management of public secondary school

Table 4.23: Principals Response on Availability of ICT Infrastructure and the Integration of ICT Management of Public Secondary School

Statement	Strongly agree		Agree		Disagree		Strongly disagree	
	F	%	F	%	F	%	F	%
Availability of technologies assist in school management	11	55.0	9	45.0	0	0.0	0	0.0
System software are expensive	7	35.0	13	65.0	0	0.0	0	0.0
ICT infrastructure requires new versions and upgrades	6	30.0	11	55.0	3	15.0	0	0.0
There is shortage of ICT equipment in my school	8	40.0	12	60.0	0	0.0	0	0.0
My school have television for visual learning and management	5	25.0	5	25.0	8	40.0	2	10.0
Electricity is a major challenge in my school	8	40.0	8	40.0	4	20.0	0	0.0
My school experience high cost of purchasing and setting up infrastructure, printing, internet, word, Database software, IMIS software and Email facility	10	50.0	10	50.0	0	0.0	0	0.0

The findings in in table 4.23 show that majority 55.0% of principals strongly agreed that availability of technologies assist in school management, the same number of principals agreed that ICT infrastructure requires new versions and upgrades. Majority 65.0% of principals agreed that system software were expensive. Majority 60.0% of principals agreed that there was shortage of ICT equipment in the school. The result further shows that 40.0% of principals agreed that electricity was a major challenge in their school while the same number of principals disagreed that their school had television for visual learning and management. This shows that apart from the high initial cost of purchasing and setting up the requisite infrastructure, the maintenance and upgrade costs, as well as the cost and effort of supporting the infrastructure were also roadblocks to the successful usage of ICTs in schools. When deputy principals were asked to indicate the same, they responded as Table 4.24

Table 4.24: Deputy Principals Response on Availability of ICT Infrastructure and the Integration of ICT Management of Public Secondary School

Statement	Strongly agree		Agree		Disagree		Strongly disagree	
	F	%	F	%	F	%	F	%
Availability of technologies assist in school management	12	60.0	8	40.0	0	0.0	0	0.0
System software are expensive	8	40.0	7	35.0	2	10.0	3	15.0
ICT infrastructure requires new versions and upgrades	8	40.0	9	45.0	3	15.0	0	0.0
There is shortage of ICT equipment in my school	4	20.0	14	70.0	2	10.0	0	0.0
My school have television for visual learning and management	7	35.0	4	20.0	3	15.0	6	30.0
Electricity is a major challenge in my school	7	35.0	7	35.0	4	20.0	2	10.0

Table 4.24 shows that the majority 60.0% of deputy principals strongly agreed that availability of technologies assist in school management, 40.0% of deputy principals strongly agreed that system software are expensive and that ICT infrastructure requires new versions and upgrades. Majority 70.0% of deputy principals agreed that there was shortage of ICT equipment in their school, 35.0% of deputy principals strongly agreed that their school had television for visual learning and management and that electricity was a major challenge in their school. This shows that getting computers into schools could be relatively easy but keeping them working was a greater challenge. Table 4.25 tabulates head of department responses on the same items

Table 4.25: Head of Department Response on Availability of ICT Infrastructure and the Integration of ICT Management of Public Secondary School

Statement	Agree		Disagree	
	F	%	F	%
Availability of technologies assist in school management	82	86.3	13	13.7
System software are expensive	82	86.3	13	13.7
ICT infrastructure requires new versions and upgrades	69	72.6	26	27.4
There is shortage of ICT equipment in my department	59	62.1	36	37.9
My department experience high cost of purchasing and setting up the infrastructure	87	91.6	8	8.4
Electricity is a major challenge in my department	91	95.8	4	4.2
Use of ICT has unclear benefits	16	16.8	79	83.2

Findings in table 4.25 shows that the majority 86.3% of head of department agreed that availability of technologies assist in school management and that System software were

expensive. Majority 72.6% of head of department agreed that ICT infrastructure requires new versions and upgrades, majority 62.1% of head of department agreed that there was shortage of ICT equipment in their department.

Majority 91.6% of head of department agreed that their department experience high cost of purchasing and setting up the infrastructure, majority 95.8% of head of department agreed that electricity was a major challenge in their department while majority 83.2% of head of department disagreed that use of ICT had unclear benefits. This implies that they had challenges of ICT infrastructure maintenance and best usage of ICT facilities.

4.6 Attitudes of Users and the Integration of ICT Management of Public Secondary School

The study sought to establish the influence of attitudes of users and the integration of ICT management of public secondary school. The researcher posed items to principals, deputies and head of department. The results are presented in Table 4.26.

Table 4.26: Principals responses on whether there times they show resistance to technological change

Response	F	%
Yes	4	20.0
No	16	80.0
Total	20	100.0

The result in table 4.26 shows that majority 80.0% of principals indicated that there was no times they showed resistance to technological change while 20.0% of principals indicated that they showed resistance to technological change which agrees with

Waibodhi (2002) who argues that administrators may sometimes show resistance to technological change.

When deputies were asked to indicate the same, they responded as Table 4.27

Table 4.27: Deputy Principal's Responses on Whether there Times they Show Resistance to Technological Change

Response	F	%
Yes	5	25.0
No	15	75.0
Total	20	100.0

The findings in in Table 4.27 shows that majority 75.0% of deputy principals indicated that there was no times they showed resistance to technological change while 25.0% of deputy principals indicated that they showed resistance to technological change. This implies that deputy principals' resistance to change concerning the use of new strategies was not an obstacle to ICT integration.

Table 4.28: Principals' Responses on Attitudes of users and the Integration of ICT Management of Public Secondary School

Statement	Strongly agree		Agree		Disagree		Strongly disagree	
	F	%	F	%	F	%	F	%
Use of ICT has unclear benefits	6	30.0	2	10.0	7	35.0	5	25.0
I sometimes feel intimidated when I have to use computer in management	2	10.0	3	15.0	7	35.0	8	40.0
Working with computer makes me feel isolated from other people during management	3	15.0	2	10.0	4	20.0	11	55.0
I have avoided computers in management as they are unfamiliar and somewhat intimidating to me	1	5.0	5	25.0	8	40.0	6	30.0
I have a high level of ICT literacy	5	25.0	7	35.0	6	30.0	2	10.0

The findings in table 4.28 shows that 35.0% of principals disagreed that use of ICT has unclear benefits and that they sometimes feel intimidated when they had to use computer in management, the same number of principals agreed that they had high level of ICT literacy. Majority 55.0% of principals strongly disagreed that working with computer made them feel isolated from other people during management.

The results of the study further shows that 40.0% of principals disagreed that they had avoided computers in management as they were unfamiliar and somewhat intimidating to them. This disagrees with Empirical (2006), who revealed that teachers who are not using new technology are still of the opinion that the use of ICT has no benefit or unclear

benefits. Table 4.29 tabulates deputy principals' responses on attitudes of users and the integration of ICT management of public secondary school

Table 4.29: Deputy Principals' Responses on Attitudes of users and the Integration of ICT Management of Public Secondary School

Statement	Strongly agree		Agree		Disagree		Strongly disagree	
	F	%	F	%	F	%	F	%
Use of ICT has unclear benefits	3	15.0	0	0.0	10	50.0	7	35.0
I sometimes feel intimidated when I have to use computer in management	1	5.0	4	20.0	10	50.0	5	25.0
Working with computer makes me feel isolated from other people during management	4	20.0	0	0.0	9	45.0	7	35.0
I have avoided computers in management as they are unfamiliar and somewhat intimidating to me	0	0.0	4	20.0	12	60.0	4	20.0
I have a high level of ICT literacy	1	5.0	5	25.0	9	45.0	5	25.0

A table 4.29 show that the majority 50.0% of deputy principals disagree that use of ICT has unclear benefits and that they sometimes feel intimidated when they had to use computer in management. The results indicates that that 45.0% of deputy principals disagreed that working with computer made them feel isolated from other people during management and that they had a high level of ICT literacy.

Majority 60.0% of deputy principals disagreed that they had avoided computers in management as they were unfamiliar and somewhat intimidating to them. This implies that deputy principals themselves may be skeptical about the effectiveness of using ICTs in school management.

Table 4.30:Head of Department Responses on Attitudes of users and the Integration of ICT Management of Public Secondary School

Statement	Agree		Disagree	
	F	%	F	%
I sometimes feel intimidated when I have to use computer in management	17	17.9	78	82.1
Working with computer makes me feel isolated from other people during management	8	8.4	83	87.4
I have avoided computers in management as they are unfamiliar and somewhat intimidating to me	8	8.4	87	91.6
I have a high level of ICT literacy	4	4.2	91	95.8

The findings in Table 4.30 shows that the majority 82.1% of head of department disagreed that they sometimes feel intimidated when they had to use computer in management, majority 87.4% of head of department disagreed that that working with computer made them feel isolated from other people during management. Majority 91.6% of head of department disagreed that they had avoided computers in management as they were unfamiliar and somewhat intimidating to them while majority 95.8% of head of department disagreed that they had high level of ICT literacy. This agrees with Watson (1999) who argued that integrating the new technologies in the educational setting requires change and different teachers will handle this change differently.

4.7 Financial Resources and the Integration of ICT Management of Public Secondary School

The researcher further sought to establish the influence of financial resources and the integration of ICT management of public secondary school. Data is tabulated in the following section.

Table 4.31: Principals Responses on the Source of Funds to Cater for ICT in Management of Public Secondary Schools

Response	F	%
Government	9	45.0
NGOs	7	35.0
PTA	3	15.0
Parents and guardians	1	5.0
Total	20	100.0

The findings in Table 4.31 shows that 45.0% of principals indicated that they got funds to cater for ICT in management of public secondary schools from the government, 35.0% of principals from NGOs, 15.0% of principals from PTA while 5.0% of principals indicated that funds to cater for ICT in management of public secondary schools was from parents and guardians. This shows that the Kenya government is still one of the key agencies that funds ICT human resource development in schools. Table 4.32 tabulates principals' responses on financial resources and the integration of ICT management of public secondary school

Table 4.32: Principals Responses on Financial Resources and the Integration of ICT Management of Public Secondary School

Statement	Strongly agree		Agree		Disagree	
	F	%	F	%	F	%
Institutions with ICT infrastructure require additional financial	12	60.0	8	40.0	0	0.0
Funding for ICT training has led to over- reliance on external donor funding	2	10.0	10	50.0	8	40.0
Financial difficulties of providing ICT facilities is the main challenge in secondary school	7	35.0	10	50.0	3	15.0

As shown in table 4.32, majority 60.0% of principals strongly agreed that institutions with ICT infrastructure require additional financial, majority 50.0% of principals agreed that funding for ICT training had led to over- reliance on external donor funding and that financial difficulties of providing ICT facilities was the main challenge in secondary school. This implies that at the secondary school level there is inadequate government funding for ICT training and facilities. Table 4.33 tabulates deputy principals on the same items.

Table 4.33: Deputy Principal’s Responses on Financial Resources and the Integration of ICT Management of Public Secondary School

Statement	Strongly agree		Agree		Disagree	
	F	%	F	%	F	%
Institutions with ICT infrastructure require additional financial	11	55.0	7	35.0	2	10.0
Funding for ICT training has led to over- reliance on external donor funding	7	35.0	8	40.0	5	25.0
Financial difficulties of providing ICT facilities is the main challenge in secondary school	7	35.0	11	55.0	2	10.0

The findings in in Table 4.33 show that majority 55.0% of deputy principals strongly agreed that institutions with ICT infrastructure require additional financial, the same number agreed that financial difficulties of providing ICT facilities was the main challenge in secondary school while 40.0% of deputy principals agreed that funding for ICT training had led to over- reliance on external donor funding. This agrees with Waibodhi (2002) who indicated that lack of funding for ICT training has led to over-reliance on external donor funding and that financial difficulties of providing ICT facilities is the main challenge in secondary school. When head of department was asked to respond to them, they responded as Table 4.34

Table 4.34: Head of Department Responses on Financial Resources and the Integration of ICT Management of Public Secondary School

Statement	Agree		Disagree	
	F	%	F	%
Institutions with ICT infrastructure require additional financial	78	82.1	17	17.9
Funding for ICT training has led to over-reliance on external donor funding	82	86.3	13	13.7
Financial difficulties of providing ICT facilities is the main challenge in secondary school	91	95.8	4	4.2

The findings in in Table 4.34 indicates that majority 82.1% of head of department agreed that institutions with ICT infrastructure require additional financial, majority 86.3% of head of department agreed that funding for ICT training has led to over- reliance on external donor funding while majority 95.8% of head of department agreed that financial difficulties of providing ICT facilities was the main challenge in secondary school.

Table 4.35 :Response on Whether there was a Levy for ICT Service in the School

Respondents	Yes		No	
	F	%	F	%
Principals	3	15.0	17	85.0
Deputy principals	6	30.0	14	70.0
Head of department	16	16.8	79	83.2

The findings in in Table 4.35 shows that majority 85.0% of principals, majority 70.0% of deputy principals and majority 83.2% of head of department indicated that they lacked levy for ICT service in the school. This shows that expenditure on ICT resources should

be significant and continuous. Asked whether schools experience high cost of technology, respondents responded as Table 4.36

Table 4.36: Response on Whether Schools Experience High Cost of Technology

Respondents	Yes		No	
	F	%	F	%
Principals	12	60.0	8	40.0
Deputy principals	10	50.0	10	50.0
Head of department	77	81.1	18	18.9

The results in table 4.36 found that majority 60.0% of principals, majority 50.0% of deputy principals and majority 81.1% of head of department indicated that they experienced high cost of technology. This implies that schools face challenges due to financial difficulties of providing ICT facilities. The findings from the observation checklist is shown in Table 4.37

Table 4.37: Observation Checklist

ICT equipment	Available		Not available		Adequate		Not Adequate	
	F	%	F	%	F	%	F	%
Computer/ Laptops	1	5.0	9	45.0	2	10.0	8	40.0
Telephone	15	75.0	3	15.0	0	0.0	2	10.0
Public address	0	0.0	16	80.0	0	0.0	4	20.0
Electricity	0	0.0	6	30.0	0	0.0	14	70.0
Fax machine	0	0.0	12	60.0	0	0.0	8	40.0
Printers	9	45.0	3	15.0	0	0.0	8	40.0
Scanners	1	5.0	17	85.0	0	0.0	2	10.0
LCD projector	0	0.0	17	85.0	1	5.0	2	10.0
Radio	0	0.0	12	60.0	0	0.0	8	40.0
Television	0	0.0	16	80.0	1	5.0	3	15.0

The findings in Table 4.37 indicates that that 45.0% of schools lacked Computer/Laptops, majority 75.0% of schools had telephone, majority 80.0% of schools lacked public address and television. Data further shows that majority 70.0% of schools had inadequate electricity, majority 60.0% of schools lacked faxed machines, the same number of schools lacked radio. Majority 85.0% of schools lacked scanners and LCD projector. This shows that availability and adequacy of infrastructure to support the deployment of ICTs in schools was a tremendous challenge that schools in the region currently faced.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study, findings of study, conclusions and recommendations.

5.2 Summary of the Study

The purpose of the study was to investigate the factors influencing integration of Information Communication Technology (ICT) in management of public secondary schools in Kikuyu Sub County, Kenya. The study was guided by four research objectives. The study adopted a descriptive research design which provided a qualitative description of trends, attitudes and perceptions of the population. The target population was 20 public secondary in Kikuyu sub-county. The study found out that principals, deputy principals and head of department had undergone training related to ICT management as indicated by majority of the principals, deputy principals and head of department.

Majority of principals strongly agreed that computer training improved management while they also strongly agreed that teacher training should include instructional application of computers. The principals indicated that they used internets and computers every day and also indicated that they used printers while they never used fax facility, however the system software were expensive. It was found that teacher's resistance to change concerning the use of new strategies and isolation from other people during management was not a challenge. It was also found out that funding for ICT training has

led to over- reliance on external donor funding as indicated by majority of head of department.

5.3 Findings of the Study

5.3.1 Personnel Competency and the Integration of ICT in Management

The study found out that principals, deputy principals and head of department had undergone training related to ICT management as indicated by majority 55.0% of principals, majority 75.0% of deputy principals and majority 72.6% of head of department.

The Majority of principals and principals strongly agreed that computer training improves management, and that teacher training should include instructional application of computers. The study further found out Secondary school employ poorly trained ICT staff as indicated by majority 65.0% of principals. The study further found out that the level and quality of technical support was very important in maintaining the confidence of educators in the reliability of access to equipment and software in the schools.

5.3.2 Availability of ICT Infrastructure and the Integration of ICT Management of Public Secondary School

The study found out that school had insufficient access to computers as indicated by majority of principals and deputy principals. The Majority of the principals and principals indicated that they used internets and computers every day they further indicated that they used printers every day and that they never used fax facility. This was

because availability of adequate infrastructure to support the deployment of ICTs in schools was a tremendous challenge that schools in the region currently faced.

The Majority of principals, head of department and deputy principals strongly agreed that availability of technologies assist in school management however they also agreed that system software were expensive. The Majority of principals and the head of department s agreed that there was shortage of ICT equipment in their school. It was also found out that electricity was a major challenge in the school. It was found out that the head of department agreed that ICT infrastructure requires new versions and upgrades

5.3.3 Attitudes of users and the Integration of ICT Management of Public Secondary School

It was found out that there was no times principals and teachers showed resistance to technological change as indicated by majority of the principals and deputy principals which implies that teacher's resistance to change concerning the use of new strategies was not an obstacle to ICT integration. The Majority of the principals strongly disagreed that working with computer made them feel isolated from other people during management.

The study further shows that the majority of deputy principals, the head of department and principals disagreed that they had avoided computers in management as they were unfamiliar and somewhat intimidating to them. The majority of the deputy principals disagreed that use of ICT has unclear benefits and that they sometimes feel intimidated when they had to use computer in management. This was also the same case to the head of department who disagreed that they sometimes feel intimidated when they had to use

computer in management, majority of head the head of department disagreed that working with computer made them feel isolated from other people during management.

5.3.4 Financial Resources and the Integration of ICT Management of Public Secondary School

The study found out that Kenya government was still one of the key agencies that funds ICT human resource development in schools. The Majority of the principals, the head of department and deputy principals strongly agreed that institutions with ICT infrastructure require additional financial. The Majority of the principals agreed that funding for ICT training had led to over- reliance on external donor funding and that financial difficulty of providing ICT facilities was the main challenge in secondary school. It was also found out that funding for ICT training has led to over- reliance on external donor funding as indicated by majority of the head of department who agreed. It study further showed that the Majority of principals, deputy principals and head of department indicated that they lacked levy for ICT service in the school. This shows that expenditure on ICT resources should be significant and continuous.

The Majority of the principals, deputy principals and head of department indicated that they experienced high cost of technology. It was also observed that a big percentage of schools lacked Computer/ Laptops, while most of schools had telephone, majority of schools lacked public address and television. The researcher further observed that a big percentage of schools had inadequate electricity, while majority of schools lacked faxed machines while most of schools lacked scanners and LCD projector.

5.4 Conclusions

Based on the findings of the study, it was concluded that teachers in secondary schools had undergone training related to ICT management and the personal competency in computer achieved through training has improved management and including instructional application of computers. Secondary school employed poorly trained ICT staff and the level and quality of technical support was very important in maintaining the confidence of educators in the reliability of access to equipment and software in the schools.

The researcher concluded that there was lack of access to computers and this hindered teachers from use of internet and computers every day. Majority of principals indicated that they used printers every day. It was also concluded that availability of technologies assist in school management although the system software were expensive and there was shortage of ICT equipment in their school coupled with electricity challenges.

There was a positive user attitude to the use of new strategies, thus user attitude was not an obstacle to ICT integration in schools and teachers never avoided computers in management as they were familiar with them. The use of ICT has clear benefits and that teachers never felt intimidated when they had to use computer in management.

The study concluded that various financial resources were availed by the Kenyan government which is still the key agency that funds ICT human resource development and infrastructure in schools, however institutions with ICT infrastructure require additional financial. Funding for ICT training had led to over- reliance on external donor

funding and that financial difficulties of providing ICT facilities was the main challenge in secondary school. Therefore funding for ICT training has led to over-reliance on external donor funding. Schools lacked levy for ICT service in the school and that they experienced high cost of technology.

5.5 Recommendations

Based on the findings the following recommendations were made:

- i) Educational Officers and Administrators need to have adequate and accurate data using Information Technology of school personnel including academic and non-academic staff and school records for effective planning and management of schools.
- ii) The Principals of schools should ensure that they have adequate technical support and maintenance of Information Systems
- iii) The Ministry of Education should ensure provision of funds that will be used for training of Teachers in Information Communication and Technology and offer experts to facilitate the training.
- iv) Kenya Educational management institute should come in by offering Training workshops on Information Technology and create awareness on its importance among school heads and teachers.
- v) Board of Management of schools should come in by building of good infrastructure in form of labs and Computers in their schools.

- vi) Principals should adopt use of Information Communication and Technology in collection of Fees among the students and application of Information Technology in the day to day management of school like Memos ,email and Term reports
- vii) Teachers should Set exams online distribute the report cards to parents through email notifications to parents cards through email and ensuring good internet accessibility in schools.
- viii) Students should be encouraged to use computers through typing assignments having lab times to access internet and have email accounts on registration for updates on school calendar of events.

5.6 Suggestions for Further Research

The researcher suggests that since the study was conducted in one area, similar study to be conducted in other areas and compare the results

REFERENCES

- Acosta, F R. (2004). Information Technology Strategic Plan of Olivarez College unpublished doctoral dissertation, University of Baguio, Philippines,
- Adeyemi, T.O. and Olaleye, F.O. (2010). Information Communication and Technology (ICT) for the Effective Management of Secondary Schools for Sustainable Development. *American-Eurasian Journal of Scientific Research*, 5 (2): 106-113, 2010.
- Batley, S. (2007). *Information Architecture for Information Professionals* 1st Edition, Chados Publishing U.K.
- Becta (2004). *A Review of the Research Literature on Barriers to the Uptake of ICT by Teachers*. Retrieved from www.becta.org.uk/research
- Ben-Zion Barta, (1995). *Information Technology in Educational Management*, Chapman and Hall, London.
- Best, J. W. and Kahn, J. U. (2003). *Research methods in education* (7th Ed.) New Delhi: Prentice Hall.
- Burt, E., and Taylor. A. J. (2000). Information and Communication Technologies: Reshaping Voluntary Organizations? *Nonprofit Management and Leadership* 11(2): 131- 143.
- Caroline Salerno (2009). *Administrator's Role in Technology Integration*", Education World, 2009.
- Cassandra, R. (2000). Teacher Use of Computers and the Internet in Public Schools, *Educational Statistics Quarterly*, Volume 2, Issue 2.
- Castells, Manuel. (1996). *The Rise of the Network Society*. Oxford, England: Blackwell.

- Christiana Maki. (2008), Information and Communication Technology for Administration and Management for secondary schools in Cyprus”, *Journal of Online Learning and Teaching* Vol. 4 No. 3
- Cloete, E. & Courtney, S. (2002), Small businesses acceptances and adoption of ecommerce in Western Cape province of South Africa, *The Electronic Journal on Information Systems in Developing Countries*, 10(4), 1-13.
- Cole ,G .A. (2004). *Management Theory and practice* 6th Edition, Sussex England.
- Empirica. (2006). Use of computers and internet in schools in Europe: Country brief. Cyprus, European Commission. Information Society and Directorate General.
- Gatara, T. H. (2010). *Introduction to research methodology*. Olive Publishing Co. Nairobi, Kenya.
- Gomez, C. (2005). Integration of ICT in science teaching. A study performed in Azores, Portugal. *Recent research developments in learning technologies*.
- Kothari, C. K. (2008). *Research methodology: Methods and techniques*. New Age International Publishers: New Delhi.
- Kroeker, K.J., Kordas, R.L., Crim, R.N. & Singh, G.G. (2010). Meta-analysis reveals negative yet variable effects of ocean acidification on marine organisms. *Ecol. Lett.*, 13, 1419-1434.
- Lucey , T. (2008). *Management Information Systems* 9th Edition Book Power ,U.K.
- Magni, F. (2009), ICT usage in Higher education”, International Technology and Education and Development Conference, Spain March 9-11 2009.

- Markauskaite, L. (2005). *Exploring Differences in Trainee Teachers' ICT Literacy: Does Gender Matter?* Accessed Dec 06, 2007 from <http://www.ascilite.org.au/conferences/brisbane05/blogs/proceedings/51-markauskaite.pdf>
- McLoughlin, C. (1999). Culturally responsive technology use: developing an on-line community of learners. *British Journal of Educational Technology*, 30(3), 231-243.
- Meelins, L. J. (2010). *Management and Organizational Behaviour* 9th Edition. Pearson Education LTD England
- Ministry of Education (MoE). 2005. *ICTs in Education Options Paper: Sessional Paper number one of 2005*. Accessed March 09, 2008 from <http://www.education.go.ke/Policiesstrategies.htm>
- Ministry of Information and Communications (MIC). (2007). *Kenya National Communications Secretariat-Western Kenya*. Accessed May 10, 2009 from <http://www.information.go.ke/indexc.php?c2=131>
- Mohammed, Y. (2010). Factor influencing the implementation of ICT in Jigawa States Schools, Nigeria. Unpublished M.Ed. Thesis, University of Ilorin.
- Nachmias, C., & Nachmias, D. (1996). *Research methods in the social sciences* (4th ed.). New York: St. Martin's Press.
- Nwagwu, N.A., (1995). The development and management of records in the Nigerian education system in data management in schools and other issues. Ehiamentalor, E.T (ed) Benin-city, Ilupeju press limited

- Nwosu, A.A., (2003). Integrating ICT into STM classroom: Status and implications. Proceeding of the 44 Stan Conference 58 to 60.
- Odzen, M. (2007). Problems with science and technology Education in turkey. *Eurasia journal of mathematics science and educational technology*, 3 (2): 157-161.
- Ogutu, J. O. (2008). The impact of Information and Communication Technology (ICT) integration in education in the six (6) NEPAD E-schools in Kenya. Unpublished MBA thesis, University of Nairobi.
- Okebukola, O. (1996). Management of Secondary schools yesterday today and tomorrow. Paper Presented at the Annual Conference of Nigeria, secondary schools s, Lagos.
- Orodho, A.J. (2004). *Techniques of writing research proposals and Reports in Educational and Social Sciences*. Nairobi: Reata Printers.
- Pernia, E. E. (2008). *Strategy framework for promoting ICT literacy in the Asia-Pacific region*. Publication of UNESCO Bangkok Communication and information unit. Asia and Pacific Regional Bureau for Education, Bangkok 10110, Thailand. Accessed July 14, 2007 from <http://portal.unesco.org/ci/en/ev.php->
- Robson, W. (1997). *Strategic management and information systems* 2nd edition Pearson education ltd England.
- Seiden, P.A., (2000). Where All The Patrons Gone, Reference and User Have *Services Quarterly*, 39(3): 2-10.

- Selwood, D., Fung, A. & O'Mahony, C. (2003). *Management of Education in the Information Age: The Role of ICT*. IFIP TC3/WG3.7 Fifth Working Conference on Information Technology in Educational Management (ITEM 2002), Helsinki. IFIP Conference Proceedings, 248. London: Kluwer Academic Publishers.
- Shcoepp, K. (2005). Barriers to technology integration in technology rich environment. *Learning and teaching in higher education: Gulf perspective*, 2(1): 1-24.
- Statistics Canada (2008). Information and communications technologies (ICTs). Accessed 15 April 2010 from <http://www.statcan.gc.ca/pub/81-004-x/def/4068723-eng.htm>.
- Tinio, V.L. (2002). ICT in education. Available: <http://www.eprimers.org>
- Towers, S & Oliver, R. (2000). *Benchmarking ICT Literacy in Tertiary Learning Settings*. ASCILITE 2000 conference proceedings. Accessed Dec 19, 2007 from <http://www.ascilite.org.au/conferences/coffs00/papers.pdf>
- Uhaegbu, A., (2001). *The Information User Issues and Themes*. Enugu, John Jacobs Classics Publishers, Ltd, pp: 152.
- UNESCO (2002). Information and communication technology in education. Accessed 15 April 2010 from <http://unesdoc.unesco.org/images/0012/001295/129538e.pdf>
- Van Akkeren, J. & Cavaye, A.L. (1999), Baby S to little S: small business IT market readiness and overcoming their fear factor, In: *Proceedings of the 10th Australasian Conference on Information Systems (ACIS99)*, Wellington, New Zealand, 1071-1083.

- Wachiye, R. (2012). Factors influencing implementation of Information Communication Technology in public secondary schools. Unpublished MBA thesis, University of Nairobi.
- Waema, T. M. 2002. *ICT Human Resource Development in Africa: Challenges and Strategies*. ATPS special paper series No. 10. African technology policy studies network. Nairobi: Ideas & Places.
- Waibodhi, J.M. (2002). *Application of ICTs in Africa: Development of Knowledge Workers in Centres of Learning*. ATPS special paper series No. 11. African technology policy studies network. Nairobi: Ideas & Places.
- Watson, G. (1999). Barriers to integration of internet into teaching and learning: professional development. Paper presented at the Asia pacific regional internet conference on operational technologies.
- Wolff, L. (1999). Costa Rica: Are Computers in School Cost-Effective?" by. In TechKnowLogia, Vol. 1 (2), 121-
- Wright, C. (2000) *Issues in Education and Technology Policy guidelines and strategy* London: Common Wealth Secretarial.

APPENDICES

APPENDIX I

LETTER OF INTRODUCTION

University of Nairobi,
School of Education,
P.O Box 92,
Kikuyu.

The Headteacher,

_____ Secondary school.

Dear Sir/Madam,

REF: PARTICIPATION IN THE RESEARCH

I am a postgraduate student pursuing a Master of Education at The University of Nairobi in the Department of Educational Administration and Planning. I am conducting a research on “**factors affecting integration of Information Communication Technology in management of public secondary schools in Kikuyu Sub County, Kenya**”. Kindly allow me to carry out the study in your school. The information provided is purely for academic purposes and the identity will remain confidential. Do not write your name on the questionnaire.

Thank you.

James B. Ogongo

APPENDIX II

PRINCIPALS: QUESTIONNAIRE

You are kindly requested to fill this questionnaire. Your participation will help gather information on factors influencing integration of Information Communication Technology in management of public secondary schools in Kikuyu Sub County. Kindly answer all the questions as honestly as possible. Your name or that of institution is not required; this will help to ensure maximum confidentiality.

Part A bio data

Put a tick (✓) in the spaces provided.

- 1 What is your gender? Male [] Female []

- 2 What is your age bracket?

 Below 25 years [] 26-36 years []

 36-45 years [] Over 45 years []

- 3 What is your highest professional qualification?

 Approved Teacher (ATS) [] Diploma teacher []

 Bachelor of Education [] Masters []

 Any other (specify).....

- 4 How long have you been in your present school?

 Less than 2 years [] 3-5 years []

 6-10 years [] Over 10 years []

Part B: Personnel competency and the integration of ICT in management

5. Apart from training as a teacher, have you undergone any training related to ICT management Yes [] No []

6. If yes above, please indicate the core theme of the training by ticking (✓) the appropriate response

Basic computer literacy, not necessarily linked to management	
Utilization of ICT hardware and software but linked to teaching and management	
Utilization of ICT for improving school management	

7. Please indicate your level of agreement or disagreement by ticking (✓) the appropriate response using the following key.

SA -Strongly Agree A - Agree U - Undecided D -Disagree SD- Strongly Disagree

Statement	SA	A	U	D	SD
Computer training will improve management					
Teacher training should include instructional application of computers					
Training in ICT will relieve headteachers of management duties					
My school experience shortage of ICT-skilled people					
Secondary schools employ poorly trained ICT staff					
My school has inadequate technical support					
ICT development enhance management					
Lack of effective training is a challenge to the ICT integration					

Part C Availability of ICT infrastructure and the integration of ICT in management of public secondary

8. Does your school have sufficient access to computers?

Yes [] No []

9. How often do use the following facilities in the management of your school

i) Internets

Everyday [] Once or twice a week []

Once or twice a month [] Never []

ii) Computer

Everyday [] Once or twice a week []

Once or twice a month [] Never []

iii) Printers

Everyday [] Once or twice a week []

Once or twice a month [] Never []

iv) Fax

Everyday [] Once or twice a week []

Once or twice a month [] Never []

10. Please indicate your level of agreement or disagreement by ticking (✓) the appropriate response using the following key.

SA -Strongly Agree A - Agree U - Undecided D -Disagree SD- Strongly Disagree

Statement	SA	A	U	D	SD
Availability of technologies assist is school management					
System software are expensive					
ICT infrastructure requires new versions and upgrades					
There is shortage of ICT equipment in my school					
My school have television for visual learning and management					
Electricity is a major challenge in my school					

My school experience high cost of purchasing and setting up infrastructure;Printing,Internet,Word,Database software,IMIS software and Email facility.					
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Part D: Attitudes of users and the integration of ICT in management

11. Are there times you show resistance to technological change?

Yes [] No []

12. Please indicate your level of agreement or disagreement by ticking (✓) the appropriate response using the following key.

SA -Strongly Agree A - Agree U - Undecided D -Disagree SD- Strongly Disagree

Statement	SA	A	U	D	SD
Use of ICT has unclear benefits					
I sometimes feel intimidated when I have to use a computer in management					
Working with computers makes me feel isolated from other people during management					
I have avoided computers in management as they are unfamiliar and somewhat intimidating to me					
I have a high level of ICT literacy					

Part E Financial resources and the integration of ICT in management

13. Of the following, indicate which ones are source/sources of funds to cater for ICT in management of public secondary? Government [] NGOs [] Church Based Organizations [] PTA [] Business Community [] Parents and Guardians []

14. Institutions with ICT infrastructure require additional financial

Strongly Agree [] Agree [] Undecided []

Disagree [] Strongly Disagree []

15. Is there a levy for ICT services in your school?

Yes [] No []

16. Funding for ICT training has led to over-reliance on external donor funding

Strongly Agree [] Agree [] Undecided []

Disagree [] Strongly Disagree []

17. Do you experience high cost of technology in your school?

Yes [] No []

18. Financial difficulties of providing ICT facilities is the main challenges in secondary school

Strongly Agree [] Agree [] Undecided []

Disagree [] Strongly Disagree []

Thank you for your cooperation

APPENDIX III

QUESTIONNAIRE FOR DEPUTY HEADTEACHERS

You are kindly requested to fill this questionnaire. Your participation will help gather information on factors influencing integration of Information Communication Technology in management of public secondary schools in Kikuyu Sub County. Kindly answer all the questions as honestly as possible. Your name or that of institution is not required; this will help to ensure maximum confidentiality.

Put a tick (✓) in the spaces provided.

Part A: Bio data

1. What is your gender? Male [] Female []

2. What is your age bracket?

 Below 25 years [] 26-36 years []

 36-45 years [] Over 45 years []

3. What is your highest professional qualification?

 Approved Teacher (ATS) [] Diploma teacher []

 Bachelor of Education [] Masters []

 Any other (specify).....

4. How long have you been in your present school?

 Less than 2 years [] 3-5 years []

 6-10 years [] Over 10 years []

Part B Personnel competency and the integration of ICT in management

5. Apart from training as a teacher, have you undergone any training related to ICT management Yes [] No []

6. Please indicate your level of agreement or disagreement by ticking (✓) the appropriate response using the following key.

SA -Strongly Agree A - Agree U - Undecided D -Disagree SD- Strongly Disagree

Statement	SA	A	U	D	SD
Computer training will improve management					
Teacher training should include instructional application of computers					
Training in ICT will relieve headteachers of management duties					
Secondary schools employ poorly trained ICT staff					
ICT development enhance management					
Lack of effective training is a challenge to the ICT integration					

Part C Availability of ICT infrastructure and the integration of ICT in management

7. Does your school have sufficient access to computers?

Yes [] No []

8. Please indicate your level of agreement or disagreement by ticking (✓) the appropriate response using the following key.

SA -Strongly Agree A - Agree U - Undecided D -Disagree SD- Strongly Disagree

Statement	SA	A	U	D	SD
Availability of technologies assist is school management					
System software are expensive					
ICT infrastructure requires new versions and upgrades					
There is shortage of ICT equipment in my school					
Electricity is a major challenge in my school					

My school experience high cost of purchasing and setting up the infrastructure					
--	--	--	--	--	--

Part D User attitudes and the integration of ICT in management

9. Are there times you show resistance to technological change?

Yes [] No []

10. Is your attitude and resistance to change a major challenge in the ICT integration in management

Yes [] No []

11. Please indicate your level of agreement or disagreement by ticking (✓) the appropriate response using the following key.

SA -Strongly Agree A - Agree U - Undecided D -Disagree SD- Strongly Disagree

Statement	SA	A	U	D	SD
Use of ICT has unclear benefits					
I sometimes feel intimidated when I have to use a computer in management					
Working with computers makes me feel isolated from other people during management					
I have avoided computers in management as they are unfamiliar and somewhat intimidating to me					
I have a high level of ICT literacy					

Part E Financial resources and the integration of ICT in management

12. Institutions with ICT infrastructure require additional financial

Strongly Agree [] Agree [] Undecided []

Disagree [] Strongly Disagree []

13. Are there levies for ICT services in secondary schools?

Yes [] No []

14. Funding for ICT training has led to over-reliance on external donor funding

Strongly Agree [] Agree [] Undecided []

Disagree [] Strongly Disagree []

15. Do you experience high cost of technology in your school?

Yes [] No []

16. Financial difficulties of providing ICT facilities is the main challenges in secondary school

Strongly Agree [] Agree [] Undecided []

Disagree [] Strongly Disagree []

APPENDIX IV

QUESTIONNAIRE FOR HEAD OF DEPARTMENT

You are kindly requested to fill this questionnaire. Your participation will help gather information on factors influencing integration of Information Communication Technology in management of public secondary schools in Kikuyu Sub County. Kindly answer all the questions as honestly as possible. Your name or that of institution is not required; this will help to ensure maximum confidentiality.

Put a tick (✓) in the spaces provided.

Part A: Bio data

1. What is your gender? Male [] Female []

2. What is your age bracket?

 Below 25 years [] 26-36 years []

 36-45 years [] Over 45 years []

3. What is your highest professional qualification?

 Approved Teacher (ATS) [] Diploma teacher []

 Bachelor of Education [] Masters []

 Any other (specify).....

4. How long have you been in your present department?

 Less than 2 years [] 3-5 years []

 6-10 years [] Over 10 years []

Part B Personnel competency and the integration of ICT in management

5. Have you attended an ICT course or training?

Yes [] No []

6. Please indicate your level of agreement or disagreement by ticking (✓) the appropriate response using the following key.

SA -Strongly Agree A - Agree U - Undecided D -Disagree SD- Strongly Disagree

Statement	SA	A	U	D	SD
Computer training will improve management in all departments					
Teacher training include instructional application of computers					
Training in ICT will relieve headteachers of management duties					
Secondary schools employ poorly trained ICT staff in the departments					
ICT development enhance proper management of all departments					
Lack of effective training is a challenge to the ICT integration in the departments					

Part C Availability of ICT infrastructure and the integration of ICT in management

7. Please indicate your level of agreement or disagreement by ticking (✓) the appropriate response using the following key.

SA -Strongly Agree A - Agree U - Undecided D -Disagree SD- Strongly Disagree

Statement	SA	A	U	D	SD
Availability of technologies assist is school management					
System software are expensive to install in all departments					
ICT infrastructure requires new versions and upgrades within the departments					
There is shortage of ICT equipment in my department					
Electricity is a major challenge in my department					
My department experience high cost of purchasing and setting up the infrastructure					

Part D User attitudes and the integration of ICT in management

8. Please indicate your level of agreement or disagreement by ticking (✓) the appropriate response using the following key.

SA -Strongly Agree A - Agree U - Undecided D -Disagree SD- Strongly Disagree

Statement	SA	A	U	D	SD
Use of ICT has unclear benefits within the departments					
I sometimes feel intimidated when I have to use a computer in my departments					
Working with computers makes me feel isolated from other people within the department					
I have avoided computers in my department as they are unfamiliar and somewhat intimidating to me					
I have a high level of ICT literacy					

Part E Financial resources and the integration of ICT in management

9. Please indicate your level of agreement or disagreement by ticking (✓) the appropriate response using the following key.

SA -Strongly Agree A - Agree U - Undecided D -Disagree SD- Strongly Disagree

Statement	SA	A	U	D	SD
Institutions with ICT infrastructure require additional financial					
My department has levies for ICT services					
Funding for ICT training has led to over-reliance on external donor funding					
My department experience high cost of technology					
Financial difficulties of providing ICT facilities is the main challenges in my department					

Thank you for your cooperation

APPENDIX V

OBSERVATION CHECKLIST

ICT equipment	Available	Not available	Adequate	Not adequate
Computers/laptops				
Telephone				
Public address				
Electricity				
Fax machine				
Printers				
Scanners				
LCD projector				
Radio				
Television				
Others				

APPENDIX VI:

RESEARCH PERMIT

**THIS IS TO CERTIFY THAT:
MR. JAMES BORORIO OGONGO
of UNIVERSITY OF NAIROBI, 30197-100
Nairobi, has been permitted to conduct
research in Kiambu County**

**on the topic: FACTORS AFFECTING
INFORMATION COMMUNICATION AND
TECHNOLOGY INTERGRATION IN
MANAGEMENT OF PUBLIC SECONDARY
SCHOOLS, A CASE STUDY OF KIKUYU
SUB COUNTY, KIAMBU COUNTY, KENYA.**

**for the period ending:
31st August, 2015**

**Applicant's
Signature**

**Permit No. : NACOSTI/P/15/8867/6327
Date Of Issue : 11th June, 2015
Fee Received :Ksh 1000**



**Director General
National Commission for Science,
Technology & Innovation**

- CONDITIONS**
- 1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit**
 - 2. Government Officers will not be interviewed without prior appointment.**
 - 3. No questionnaire will be used unless it has been approved.**
 - 4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.**
 - 5. You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.**
 - 6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.**

REPUBLIC OF KENYA

NACOSTI
**National Commission for Science,
Technology and Innovation**

**RESEARCH CLEARANCE
PERMIT**

Serial No. A 5328

CONDITIONS: see back page