FACTORS INFLUENCING SCHOOL PRINCIPALS' INTEGRATION OF ICT IN ADMINISTRATION OF PUBLIC SECONDARY SCHOOLS IN GITHUNGURI SUB COUNTY, KIAMBU COUNTY, KENYA

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DECLARATION

This research project is my original work and has not been submitted for award of degree in any other University

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DEDICATION

I hereby wish to dedicate this project work to my parents John Muchiri and Magdalene Nyambura for their words of encouragement, moral support and prayers. Secondly, to my wife Lucy Wangare for her guidance and lastly to my sons Eric Muchiri, Elvis Hinga and Mark Leslie Njenga for their patience and perseverance. May God bless you all abundantly.

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ABBREVIATIONS & ACRONYMS

HODs	Heads of Departments
ECA	Economic Commission for Africa
ICT	Information Communication Technology
KICD	Kenya Institute of Curriculum Development
LAN	Local Area Network
MOEST	Ministry of Education Science and Technology
NESCK	National Economic and Social Council of Kenya
NEPAD	New Partnership for African Development
OECD	Organization for Economic Cooperation and Development
SPSS	Statistical Packages for Social Sciences
UNESCO	United Nations Educational Scientific and Cultural Organization

ABSTRACT

The rapid growth in Information Communication Technology (ICT), has brought notable changes in the twenty first century as well as affected the demands of modern societies. ICT is increasingly becoming important in our day to day lives as well as in our education system. This study aimed at investigating factors influencing school principals' integration of Information Communication Technology in public secondary schools in Githunguri Sub County, Kiambu County, Kenya. The study sought to achieve the following objectives: examine the principals' attitude, physical mobilization of Information Communication Technology resources, accessibility of Information Communication Technology resources, principals' Information Communication Technology literacy and their influence on integration of Information Communication Technology in school administration. The study employed descriptive survey design and targeted a population of 32 principals, 32 deputy principals and 123 heads of departments. It was carried out in 10 public secondary schools; 10 Principals, 10 deputy principals and 40 heads of departments were randomly sampled to participate in this study out of. For the purposes of validating the research instrument which was the questionnaire, a pilot study was carried out in two schools outside the area under study. Reliability index of the study was reported for each questionnaire. Data was collected, coded and analyzed to form the basis of the research findings. The study's main findings were that lack of enthusiasm towards ICT integration among principals; inadequate ICT literacy among principals, deputy principals and heads of departments, inadequate ICT resources and related infrastructure and lack of technical support for heads of departments as well as frequent power outages influenced ICT integration in public secondary schools to a great extent. The main conclusions of the study are that poor attitude towards ICT integration among principals, ICT illiteracy among principals, deputy principals, inadequate ICT resources and related infrastructure and lack of technical support were the main hurdles towards ICT integration in school administration in public secondary schools in Githunguri Sub County, Kiambu County, Kenya. The study came up with the following recommendations: First, the ministry of Education in conjunction with the Kenya Institute of Curriculum Development should come up with tailor made ICT integration programs to impart relevant skills, knowledge and attitude to school administrators. Secondly, the Ministry of Education should come up with modalities to ensure that public secondary schools have adequate ICT resources. For further research, this study made the following suggestions for further studies; a study on factors influencing ICT integration among primary school head teachers in school administration in public primary schools and a study on effectiveness of ICT training among school administrators on ICT integration in school administration.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The rapid growth in Information Communication Technology (ICT), has brought notable changes in the twenty first century as well as affected the demands of modern societies. ICT is becoming increasingly important in our day to day lives as well as in our education systems. As such, there is a growing demand on the educational institutions to integrate ICT in teaching the skills and knowledge students need for the 21st century. Realizing the effect of ICT on the work place and everyday life, today educational institutions try to restructure their educational administration in order to bridge the existing technological gap in school administration. This restructuring process requires effective integration of technologies into the existing environment in order to enhance professional output as well as the general administration of the school (Buabeng, 2012).

School administration is a key determinant for the realization of desired outcomes and success in schools and hence it is viewed as critical by all education stakeholders. In Africa, the Economic Commission for Africa has indicated that the ability to access and use information is no longer a luxury but a necessity for development. Gray and Smith (2007) observe that the twenty first century school administrator faces numerous challenges emanating from ICT integration. This arises from the fact that many developing countries in Africa are still slow in ICT

integration (Aduwa,Ogiegbean & Iyamu; 2005).Attitude issues as well as lack of ICT competence also affect ICT integration in school. Pfluam (2004) in his study on ICT integration in secondary school observed that there were a lot of computers at Springdale high school in Ohio city in the United States of America but no school administrators committed to ICT integration. As a result, White head ,Jensen and Boschee (2003) have realized that the current movement towards putting the latest technology into classrooms is causing school administrators to reassess school programs and policies to examine the impact of ICT integration on school administration.

Maki (2008) stipulates that ICT integration plays a vital role in supporting powerful and efficient management and administration in the education sector. In her study in Cyprus secondary schools, she observes that ICT integration is essential for personnel administration, student administration, resource administration, financial administration and general administration. From this study, Maki (2008), referring to a study by the European Commission in Cyprus revealed that secondary schools in Cyprus integrated ICT as a teaching tool as well as an a tool for school administration. However, Empirica (2006) observed that although significant steps had taken place in as far as ICT integration in secondary schools in Cyprus was concerned, integration in school management and administration still remained at an early stage.The United Nations Scientific and Cultural Organization (UNESCO) (2000) provided special attention to the integration of ICT for development for which urgent and concerted actions

internationally have increasingly aimed at ensuring that popularity of ICT in the management and administration of educational institutions and as a result of research work in these institutions is maturing.

African countries have only recently begun to show the micro economic stability needed for education development and therefore the need to integrate ICT in education administration is real more than ever before (Nduati & Bowman,2005).According to Zainally (2008), ICT Integration provides facilities and possibilities for the education administrators to perform their tasks. In this regard, ICT integration can be realized in student administration for example students' records to various resource administrations in an education system. Willey (2003) notes that school principals need effective and fast communication and accessibility to information. This is because school administrators need to correspond through email and the internet, create websites for school marketing so as to communicate to parents, other school administrators, business executives, school suppliers and the wider community.

According to Visscher (2003) and Tearle (2004) studies in the United Kingdom, the Netherlands, Malaysia and South Africa agree with the fact that school administrators require facilitation with appropriate ICTs and related infrastructure to optimize ICT integration in their administrative duties. Saiti and Prokopiadou (2009) in their study on the impact of ICT integration on school administration indicate that the school environment may be considered as a synonym for

modernization of all organizations including schools as they provide advanced technological tools and applications.

Kenya's advancement in ICT integration in the education sector is increasingly becoming complex and multidimensional thereby requiring a huge amount of resources in terms of human, financial and physical resources to ensure that secondary schools administration is efficient (Waema,2005). ICT integration in secondary school environments is considered to be part of the extensive technological modernization of administration and education as well as the electronic government (MOEST, 2005).The introduction of innovative technological applications in schools is connected with changes not only at the school level but also in carrying out administrative tasks such as Kenya Certificate of Secondary Education (K.C.S.E) online registration. For the above benefits to be reaped the school principals should provide support and visionary leadership (Hayes, 2006).

Further, the Organization for Economic Cooperation and Development (OECD, 2011) supports the need for far sighted school leadership which is needed to bring and sustain the dramatic changes enabled by ICT integration, to persuade and give confidence to all involved such as the non teaching staff, the teachers, the heads of department, the deans of studies as well as the deputy principals of secondary schools.To ensure effective ICT integration in school administration, the Government of Kenya has put in place Vision 2030 which aims to make Kenya a

newly industrialized middle income country providing quality life for its citizens by the year 2030 (National Economic Social Council of Kenya,(NESCK, 2007).The plan demands the improvement of education management from every education institution according to the principles of management, efficiency and effectiveness. The mission to increase efficiency, effectiveness and performance by not allowing room for wastage and fully utilizing scarce resources if successful will minimize the cost of education thereby producing an education system with a world class management, superbly organized , effectively ran and acutely responsive to changing needs and situations. One of the ways that this can be fully realized is by making our education system and especially the school principals in secondary schools completely integrate ICT in the administration of the affairs in their schools.

1.2 Statement of the problem

The role of ICT in secondary schools cannot be overemphasized due to the many advantages associated with it including easy work presentations, easy information access and easy monitoring and evaluation among others. Given that school principals as school administrators are concerned with issues of students registration, student discipline, class attendance, curriculum administration, personnel management, school community relationship, provision and maintenance of physical facilities and financial management, managing such a high number of activities can be quite a challenging task in the absence of ICT

resources in schools (Okumbe,2001). While some countries have reported up to 41% of ICT integration in school management, administration and learning, the proportion remains substantially low in Kenya despite the huge amounts invested in ICT (Kelles 2003).Additionally, training programs in ICT for the education management sector have been necessary since the rapid change in ICT demands continuous professional training(MOE, 2009). Despite these facts, most secondary school administrators have not yet integrated ICT into secondary school administration. According to the Githunguri Sub County Education Office (2013), out of the 32 public secondary schools in the Sub County, only 12 of them, (38%) of them have integrated ICT in school administration and therefore the need for this study (Githunguri Sub County Education Office,2014).

1.3 Purpose of the study

The purpose of this study was to investigate the factors that influence school principals' integration of ICT in administration of public secondary schools in Githunguri Sub County, Kiambu County, Kenya.

1.4 Objectives of the study

This study aimed to achieve the following objectives;

i. To examine how school principals' use ICT in administration of public secondary schools in Githunguri Sub County.

ii. To establish the extent to which the school principal's mobilization of ICT infrastructure influences school principals' integration of ICT in administration of public secondary schools Githunguri Sub County.

iii. To establish the extent to which the principal's accessibility to ICT infrastructure influences school principals' integration of ICT in administration of public secondary schools Githunguri Sub County.

iv. To determine the extent to which school principals'' ICT literacy influences integration of ICT in administration of public secondary schools in Githunguri Sub County.

1.5 Research questions

This study aimed to answer the following research questions

i. How do school principals use ICT in administration of public secondary schools in Githunguri Sub County?

ii. To what extent does the school principal's mobilization of ICT infrastructure influence school principals' integration of ICT in administration of public secondary schools in Githunguri Sub County?

iii. To what extent does accessibility of ICT infrastructure influence school principals' integration of ICT in administration of public secondary schools in Githunguri Sub County?

iv. To what the extent to school principals' ICT literacy influence their integration of ICT in administration of public secondary schools in Githunguri Sub County?

1.6 Significance of the study

The resultant findings from this study would be beneficial to the education stakeholders and policy makers in Githunguri Sub County should they need to review their policies so as to make as many secondary school principals integrate ICT in school administration. The same findings would also be beneficial to school principals and teachers should they want to learn the benefits of ICT integration in school administration and teaching. Also, future researchers would benefit from these findings should they want to investigate school based factors influencing ICT integration and adoption in public primary schools.

1.7 Limitations of the study

The study was limited by the fact that data will be collected using a self assessment questionnaire, which is subject to respondent bias. To overcome this, the researcher used more than one type of instrument and different respondents in order to triangulate thereby increasing reliability and validity of the research instruments.

1.8 Delimitations to the study

This study delimited itself to public secondary schools principals, Deputy Principals and Heads of Departments only. It therefore excluded teachers and school managers like the Board of Governors and the parent teachers association. Therefore the findings cannot be generalized to all secondary schools.

1.9Assumptions of the study

The assumptions of this study were:

i. The participants in the study would give honest answers.
ii. The participants were aware of ICT integration in school administration.
iii. Influence of ICT integration in school administration would be influence by various institutional factors which can be measured using questionnaires.

1.10 Definition of significant terms

The following are definitions of significant terms used in this study;

ICT availability refers to the aspect of ICT tools being ready for use for the purposes of secondary school administration.

ICT accessibility refers to a situation whereby ICT tools can be easily reached for the purposes of secondary school administration

Administration refers to the formalized system which is intended to control, supervise, plan and make decisions about various activities of the organization on the basis of established authority.

Information Communication technology (ICT**)** refers to a diverse set of technological tools and resources used to transmit, store, create, share or exchange information.

Attitude refers to the way a school principal thinks and feels about ICT integration in school administration.

Integration refers to using any ICT tool such as the internet, e- learning technologies, CDs and ROMs to assist in the administration of the school.

ICT literacy refers to being able to handle a wide range of various computer applications for various purposes.

1.11Organization of the study.

The study was organized into five chapters. The first chapter highlighted the background information and organization of the study. Chapter two comprised a discussion of the literature review. Chapter three comprised the research methodology Chapter four comprised data analysis, presentations and discussions while chapter five involves summary, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents reviewed literature on factors influencing school principals' integration of ICT in administration of public secondary schools in Githunguri Sub County, Kiambu County, Kenya**.** These factors comprise how school principals use ICT, ICT mobilization, ICT accessibility and school principals' competence. The summary of literature review, conceptual and theoretical frameworks are also be discussed.

2.2 How School principals' use ICT and its integration in school administration

The personal willingness of school principals to integrate ICT in administration is crucial for a school to be develop technologically (Johnstone & Woudbury, 2003).The rapidly changing nature of ICT and the continual bombardment of new games, software, faster processors, wider screens, iPods and advances in mobile technology have meant that schools and in particular secondary school principals as leaders more than ever before are impelled to plan for future uses of ICTs and to facilitate these uses and changes aspects of leadership which did not exist previously. According to Katz (2002), school principals as leaders must be able to articulate an institutional organizational vision that assumes widespread access to

information and services through networks. Choralambous and Loannou (2008) in their study on impact of ICT integration in school administration among secondary school principals in Cypriot schools observed that Cypriot school administrators use ICTs in school administration. This implies that if school principals as leaders regularly integrate ICT in school administration they will encourage their followers especially the deputy principals and heads of department to integrate ICT in their administrative tasks which will in effect make school administration easy. Flanagan (2003) observes that school principals who are not prepared for ICT integration struggle to develop the resources required for integration. When ICT resources are introduced in schools, very few, if any, school principals have in fact used them in meaningful ways with students teachers and non teaching staff and therefore lack the necessary academic vision and experience to lead ICT integration. According to Flanagan (2003) in many secondary schools, informal leaders have emerged from classrooms, libraries and computer labs to take up the difficult task of planning for ICT integration and supporting distributed and often uncoordinated efforts by unenthusiastic teachers. Unfortunately, ICT planning and integration has too often been limited to the goal of acquiring hardware and software. Schools have focused on purchasing equipment, setting up laboratories and wiring their buildings without considering the substantial organizational and cultural changes that are necessary to support appropriate use of ICT to enhance school administration. Moyle (2008) observes that many school leaders are also unsure of how data can be used to inform their

work, what decisions concerning ICT they should make, and what decisions require their direct oversight. This is a waste of ICT resources since it greatly impedes ICT integration in school administration.

2.3 Mobilization of ICT infrastructure and its integration in secondary school administration

Physical mobilization and access to ICT infrastructure is the first step towards making technology accessible to schools. Collins (1996) defines infrastructure as the physical equipment (hardware and software) that enables a network to function. These include: hardware costs, software costs, connectivity costs services costs which include maintenance and technical support, infrastructure utilities costs like electricity consumption, furniture, security and insurance. Technology needs to be affordable to schools if it is to be integrated in their administration. At the national level Majanja (2001) observes that affordability could be limited by the high cost of putting infrastructure in place and is linked with the issue of poverty .At the institution level, expensive hardware and software as well as the high cost of communication and services restrict access to ICT. Most schools in Kenya do not have the means to purchase expensive computers and hardware to provide training for their staff. Affordability could be achieved through the use of open source software or cheaper versions of software which can operate on older procurement or refurbished computers, redesigning of hardware so as to lower the cost of internet access, merging internet technology to

use television connection with modification and using community wireless LAN (Local Area Networks).However, Wells et al (2001) cautions against integrating technology for which local expertise is not available, as it would result in high maintenance costs for the user. Very few public secondary schools have enough ICT tools for general school administration.(Computer for Schools ,2007).Those schools with ICT infrastructure have acquired it through initiatives supported by parents, the government, Non Governmental Organizations or other development agencies and the private sector, including the New Partnership for African Development (Nepad), e-school program (UNWIN,2006). A recent survey of 6 nationally spread but purposely selected schools in Kenya with computers revealed that 51% of the schools had received computers through government and Non Governmental donations while 54% and 18% had been acquired from Computer for Schools initiatives respectively. The Parent Teachers' Associations and individual students had contributed 16% and 7% respectively (Oloo, 2009).

2.4 Accessibility of ICT infrastructure and its integration in secondary school administration

Access to ICT infrastructure and resources in secondary schools is a necessary condition to the integration of ICT in school administration (Plomp, Anderson, Law & Quale, 2009).Effective integration of ICT into school administration mainly depends on the accessibility of ICT resources such as hardware and software.A majority of the schools surveyed nationally in Kenya by computer for

schools (2007) revealed that 59% of secondary schools had no internet connectivity. These statistics points to low access to ICT facilities in public secondary schools in Kenya and low ICT integration for school administration purposes. The Kenyan government's efforts towards improving access to ICT has been hampered by a lot of hurdles, one of them being political interferences (Ayodo, 2009).The move was meant to provide one digital laboratory for use by public secondary schools per constituency represented in parliament. The same survey revealed that a majority of school principals were ill equipped to effectively integrate ICT in school administration. This was due to lack of adequate number of computers, educational application trainings and policy and strategy on how integration is done. (Oloo,2009).In a survey of ICT and Education in Africa : Kenya Country Report by Farrel, (2007), it has been observed that high levels of poverty, limited rural electrification and frequent power disruptions result in limited access to ICT integration in public secondary school administration as well as teaching and learning. The survey also revealed that although some of these secondary schools have computers, these are only limited to administrative purposes and only a few ICT tools are availed for teachers and students.

In most Sub Saharan Africa, inadequate technological infrastructure such as lack of hardware and software and the internet, limit individual and school community members to access ICT thereby posing a barrier to its integration with the school administration as well as teaching and learning (Menda 2006).Additionally the

African region faces many external systematic factors such as electricity, technical faults, import duties and network configuration problems. Available literature confirms that East Africa faces a shortage of electrical energy supply. In Tanzania, the national electricity grid is limited to commercially viable areas missing out most of the secondary schools in the rural areas. This together with frequent breakdown has increased the cost of owning and integrating of ICT infrastructure (Farrel, 2007). It has therefore made it impossible for secondary schools in the rural areas to access and integrate ICT in school administration.

2.6 Principals' literacy and integration of ICT in school administration

Secondary school leadership is an important factor in the effective integration of ICT in school administration (Afshari, 2012).As leaders of school development, including ICT integration in schools, principals should have a personal proficiency in computer use (Schiller, 2003).They should realize the importance of the new technologies in education and improve their knowledge and skills in the use of computer and other technologies. However, although technology leadership responsibilities may have been assigned formally to school principals, most of them do not have background or suitable training to feel confident in dealing with technology (Stuart et al., 2009).

Previous research suggests that ICT literacy and using computers are important factors that influence secondary school principals in implementing ICT integration (Stuart, 2009).In the ICT age, school principals must possess

computing capabilities (Fellon, 2006).They should use technology and understand how it can be integrated effectively in learning, teaching and school administration (Schiller 2003).

In Australia, Fellon, (2006) conducted a quantitative study on 369 secondary school principals to assess the level of their ICT integration and their perceived competencies in ICT integration.93.5% of the principals utilized computers at home and school. The study also revealed that the main ways of ICT integration was sending school and related personal related e-mails as well as receiving them and accessing the world wide web (www) while construction of spreadsheets, databases and presentations was much less common.

Stuart and Remus (2009) explored the association between ICT literacy of school leaders and the intention to integrate ICT. The findings indicated that principals who perceived themselves as technology leaders have high levels of ICT literacy and that they frequently integrate ICT in their administrative and instructional tasks. In fact, competence in operating a computer and utilizing software helps school principals to be effective in as far as ICT integration is concerned. Therefore, principals as technology leaders should be fluent in ICT integration as aspects such as word processing, spread sheets and presentation software (Attaran & Vanlaar, 2001).They should also know how to use the internet to communicate with their staff and the broader community. If school leaders use ICT and realize the advantages of its integration in education administration then ICT integration

is likely to be implemented. Anderson & Dexter (2005) suggested that professional development opportunities should be provided for school principals to promote their level of ICT integration and to increase their productivities In fact effective training programs help the principals to integrate ICT for accessing and finding information and new knowledge. Furthermore, it helps them to develop processes for effective decision making and problem solving which eventually results in better accountability. In fact ICT integration has proved to be able to markedly improve the role of principals in the educational process.

A study by Gakuu & Kidombo (2010) on pedagogical integration of ICT in selected Kenyan secondary schools observed that most secondary schools in Africa use computers as an object of study rather than a tool for teaching and learning. The results of the study showed that ICT integration in school administration is influenced by the school's ICT policy and school managers' level of ICT skills.

2.7 Summary of literature review

Reviewed literature has shown that ICT integration in many secondary schools globally is still very low. This is despite the fact that efforts by national governments, development partners and non-governmental organizations have seen many of these schools get computers. Also, poverty, power failure and high ICT maintenance costs have been revealed as the main challenges towards ICT integration in school administration. Most secondary school principals have been

depicted as resistant to technological change. Lack of ICT literacy among school principals in secondary schools has been identified as another barrier to ICT integration in school administration.ICT integration has many benefits some which are personnel administration, student administration, resource administration, financial administration and general administration. This will not only lead to effective school administration but also ensure quality teaching and learning.

2.8 Theoretical framework

This study was informed by Activity Theory (Kuutti, 1996).This theory focuses on the interaction of school administrators' activities and their consciousness within the secondary school context. Activity theory was adopted for this study because it provides a clear view to the interactions that take place among the various participants; school principals, Deputy principals and Heads of Departments in as far as ICT integration in school administration is concerned. The secondary school context is an entire activity system that integrates the school principal, the Deputy Principal and the Heads of Departments with ICT tools and resources as well as the school community as a whole. The contradictions that occur in activity system help to understand the breakdown in relationships. Analysis of contradictions reveal why ICT integration in school administration was not achieved thereby transforming the activity theory in order to ensure successful integration.

2.8 Conceptual framework

This study seeks to investigate the factors that influence secondary school principals' ICT integration in school administration in Githunguri Sub County, Kiambu County, Kenya. These factors include principals' attitude, availability and accessibility of ICT infrastructure and ICT competence among secondary school principals. The interrelationship between variables is as shown in figure 2.1 below

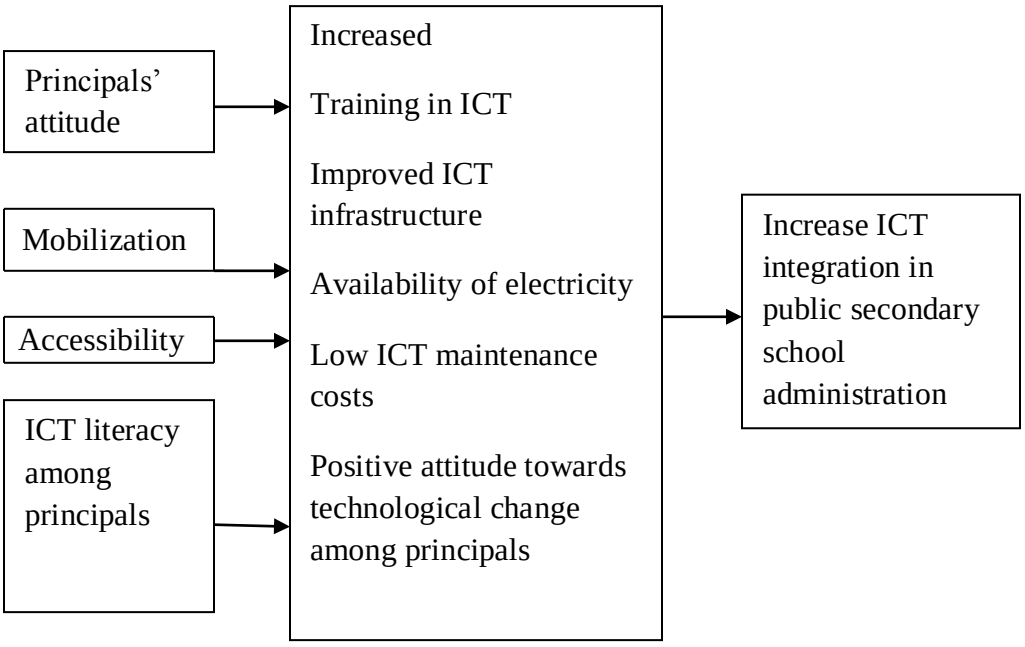

Figure 2.1 Factors influencing secondary school principals' ICT integration in school administration in Githunguri Sub County, Kiambu County, Kenya

The factors formed the independent variables while ICT integration in school administration formed the dependent variable. The independent variables directly

influence ICT integration in school administration by public secondary school principals.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the various methods that were used by the researcher in conducting this study**.** It contains research design, target population, sampling techniques and sample size, validity and reliability of the research instruments to be used and data collection techniques.

3.2 Research design

In this study, the researcher used descriptive survey design. Mugenda and Mugenda (2003) define a survey as an attempt to collect data from members of population with respect to one or more variables. Descriptive survey research is therefore a self report which requires the collection of quantifiable information from a sample thereby providing accurate description of the secondary school principals' attitude, their ICT competence and availability and accessibility of ICT infrastructure.

3.3 Target population

Mugenda and Mugenda (2003) define target population as an entire group of individuals, events or objective with common observable characteristics. The target population for this study included 32 public secondary schools, 32 principals, 32 deputy principals and 123 head of departments..

3.4 Sample size and sampling techniques

Orodho (2000) defines a sample as a small portion of target population selected for analysis.

Table 3.1 Sample frame

Group	Population size	Sample size	Sample Percentage (%)
Principals	32	10	30
Deputy Principals	32	10	30
H.O.Ds	123	40	30
Total	**187**	**60**	**30**

This study randomly sampled 30% for school principals and their deputy principals and Heads of Departments. This is for the purposes of ensuring reliability and validity of the study findings (Mugenda and Mugenda,2003)

3.5 Research instruments

The main research instrument for this study was the questionnaire. Mugenda and Mugenda (2003) observe that questionnaires allow a researcher to measure for or against a particular view point. The questionnaires for all the respondents was

divided into 5 parts; Part A comprised the respondents' demographic information. Part B comprised attitude and ICT integration. Part C comprised availability of ICT infrastructure. Part D comprised accessibility and ICT integration. Part E contained ICT competence and ICT integration

3.6 Validity of research instruments

Validity is the extent to which a test or instrument measures what it is intended to measure (Mbwesa, 2008).To achieve the validity of the research instruments for this study, the researcher conducted a pilot study in two schools (Ruiru Boys and Spinners secondary schools) outside the Sub County under study. The findings from this pilot study were not included in the final study. After scrutiny, the researcher amended the instruments to ensure content and criterion validity.

3.7 Reliability of research instruments

Mugenda and Mugenda (1999) define reliability as a measure of the degree to which a research instrument yields consistent results of both data after repeated trial. To ensure reliability the researcher employed the test-retest technique. This involves administering the test to one appropriate group selected randomly. After the lapse of one week the same test was administered to the same group.

The two sets of scores were correlated using the Pearson's product moment correlation coefficient formula to determine the correlation coefficient (r) between the two sets of scores.

$$r = \frac{N\sum xy-(\sum x)(\sum y)}{\sqrt{[n\sum x^2-(\sum x)^2][n\sum y^2-(\sum y)^2]}}$$

Where x=first set of scores; y=second set of scores; $\sum$ x=the sum of the first set of scores; $\sum$y= the sum of second set of scores; $\sum$**x=** the sum square of first set of scores. $\sum$**y** =to the sum square of second set of scores; $\sum$**xy**=the sum of cross product of x and y and n=total number of respondents. According to Mugenda (1999), reliability coefficient above 0.80 is satisfactory. The reliablilty index of the questionnaire was 0.92.

3.8 Data collection procedures

Data was collected through primary and secondary sources of data. The main primary source of data was the questionnaire for principals, deputy principals and heads of departments. The secondary source of data was a record of schools that have integrated ICT in school administration. The questionnaires were administered through drop and pick later method.

3.9 Data analysis techniques

Data was analyzed both qualitatively and qualitatively. Qualitative data was analyzed using descriptive statistics such as frequency distribution and percentages with the aid of a computer software (SPSS).Qualitative data was

analyzed using content analysis which comprises categorizing and indexing the responses and other field notes into common themes in line with the objectives. Frequencies and percentage tables were used to present data.

3.10 Ethical considerations

To conduct this study, a research permit was sought by the researcher from the National Council for Science and Technology (NCST) before embarking on the study. A visit to the Githunguri Sub County Education Office was made to discuss the research. The researcher personally administered the questionnaires to the principals, deputy principals in the selected schools. Respondents were assured that utmost confidentiality would be observed. Duly completed questionnaires would be collected immediately.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATIONS AND DISCUSSIONS

4.1 Introduction

This chapter presents data analysis and presentations on investigation into factors influencing school principals' integration of Information Communication Technology in administration of public secondary schools in Githunguri Sub County, Kiambu County, Kenya. Responses from public secondary school principals, deputy principals and Heads of Departments are presented. The first section provides demographic information collected from the respondents from Githunguri Sub County. The second section provides an analysis of the factors that influence principals' integration of Information Communication Technology in public secondary schools.

4.2 Questionnaire return rate

The researcher sought to determine the questionnaire return rate from the principals, deputy principals and Heads of Departments. The findings were as shown in table 4.1

Table 4.1 Respondents' questionnaire return rate

Respondent	Sampled	Returned	Percent return rate
Principals	10	10	100.0
Deputy principal	10	10	100.0
H.O.Ds	40	40	100.0
Total	**60**	**60**	**100.0**

The 100% questionnaire return rate can be attributed to the fact that the respondents were quite cooperative. As such, the collected data was taken to be a true representation of the respondents' views due to the independence of the questionnaire method of data collection. The returned questionnaires were coded and analyzed using SPSS. Data was presented using frequency tables

4.3 Demographic information of respondents

This refers to the personal characteristics of the respondents. The principals, deputy principals and Heads of Departments were required to indicate their gender, age, length of stay and professional qualifications. The Heads of Departments were additionally required to indicate the departments that they head. The purpose of this information was to establish if these respondents were professionally trained and experienced enough to understand and respond to the questionnaire items efficiently.

4.3.1 Demographic information for the principals

The principals were required to indicate their gender. The findings are as presented in Table 4.2

Table 4.2. Distribution of principals by gender

Gender	Frequency (f)	Percentage (%)
Male	5	50.0
Female	5	50.0
Total	**10**	**100.0**

From the above table, there is gender parity in distribution of principals in public secondary schools involved in this study. This is a positive attribute since students have enough role models in these secondary schools.

4.3.2 Principals' age

The principals were required to indicate their age. Age was found to be of paramount importance if ICT integration in school administration was to be effectively implemented. The findings are presented in Table 4.3

Table 4.3 Distribution of principals by age

Age	Frequency (f)	Percentage (%)
31-40	1	10.0
41-50	8	80.0
51-60	1	10.0
Total	**9**	**100.0**

A majority of the principals (80 percent) are 50 years and below. This is a positive attribute for effective integration of ICT in secondary school administration since according to Medeiros (2012), older adults tend to develop a less interest in ICT tool and resources than younger adults. If such adults are school principals, they can hardly ensure effective ICT integration in school administration. This study has therefore established that the school principals involved in this study were of the right age to develop more interest in ICT integration in school administration.

4.3.3 Principals' professional qualification

The principals were required to provide their highest professional qualification levels. Table 4.4 shows the findings;

Table 4.4 Distribution of principals by professional qualifications

Professional qualifications	Frequency (f)	Percentage (%)
Diploma	2	20.0
B/ED	6	60.0
M/ED	2	20.0
Total	**10**	**100 .0**

The above findings are positive in that a majority of the principals (80 percent) are degree holders. This implies that they are well informed on academic and school administration matters as well as being qualified to head their respective schools.

4.3.4 Principals' length of service

The principals were required indicate their length of service in their current work stations. The findings are shown in Table 4.5

Table 4.5 Distribution of principals by length of service

Length of service	Frequency (f)	Percentage (%)
1-4	3	30.0
5-9	5	50.0
10-14	2	20.0
Total	**10**	**100.0**

From the findings above, most of the principals (50 percent) have served in their current station for between 5 to 9 years and 20 percent have served for over 10 years. This is a positive attribute since they have an experience on ICT integration in the administration of their schools and the arising challenges.

4.3.5 Categories of schools involved in the study

The researcher sought to find out the school set ups in Githunguri Sub County. The findings are shown in Table 4.6

Table 4.6 Distribution of categories involved in this study

School category	Frequency (f)	Percentage (%)
Boys' boarding	1	10.0
Girls' boarding	5	50.0
Mixed boarding	2	20.0
Mixed day	2	20.0
Total	**10**	**100.0**

The above findings reveal that most of the schools (50 percent) selected for the study were girls' boarding. The sample is a good representation of all the categories of public secondary schools.

4.3.6 Demographic information of Deputy Principals

The researcher sought to find out the gender among the deputy head teachers. The findings are shown in Table 4.7

Table 4.7 Distribution of deputy principals by gender

Gender	Frequency (f)	Percentage (%)
Male	6	60.0
Female	4	40.0
Total	**10**	**100.0**

From the table above, a majority of teachers, 60 percent, are males while 40 percent are females. This is encouraging since there is an almost equal representation of gender among deputy principals who interact with ICT resources regularly in their administrative tasks and the arising challenges in the secondary schools selected for this study.

4.3.7 Age among deputy principals

The deputy principals were required to indicate their age bracket. The findings are shown in Table 4.8

Table 4.8 Distribution of deputy principals by age

Age bracket	Frequency (f)	Percentage (%)
31-40	1	10.0
41-50	6	60.0
51-60	3	30.0
Total	**10**	**100.0**

Generally, a majority of the deputy principals, 60 percent, are between 41 to 50 years while 30 percent are between 51 to 60 years. This is a positive attribute since they are of age to understand the importance of ICT integration in administration of public secondary schools and therefore the need to be ICT leaders in their respective schools.

4.3.8 Deputy Principals' professional qualifications

The researcher sought to establish the deputy principals' professional qualifications. The findings are as shown in Table 4.9 below

Table 4.9 Distribution of deputy principals by professional qualifications

Education level	Frequency (f)	Percentage (%)
Diploma	4	40.0
BEd	4	40.0
MEd	2	20.0
Total	**10**	**100.0**

From the findings above, generally, a majority of deputy principals are first and second degree holders. This is a positive attribute since for effective ICT integration take place, a highly trained school administration force is crucial. This is an indicator that all the deputy principals in a nutshell are well informed and equipped to carry out their professional and administrative duties.

4.3.9 Length of stay among deputy principals

The researcher sought to find out the deputy principals' length of stay in their current station. The findings are shown in the Table 4.10

Table 4.10 Distribution of deputy principals by length of stay

Length of stay	Frequency (f)	Percentage (%)
1-10 years	3	30.0
11-20 years	7	70.0
Total	**10**	**100.0**

From the above findings, a majority of the deputy principals (70 percent) have stayed in the same station for over 11 years . This is encouraging since it is an indicator that they have had time to interact with the ICT resources in their schools and are therefore aware of the various tasks performed using these resources as well as the accompanying challenges.

4.3.10 Demographic information of Heads of Departments

The head of departments were required to indicate their gender. The findings are shown in Table 4.11

Table 4.11 Distribution of Heads of Department by gender

Gender	Frequency (f)	Percentage (%)
Male	28	70.0
Female	12	30.0
Total	**40**	**100.0**

Findings from the above table reveal that a majority of the Heads of Departments (70%) are males. This is a negative trait which can have adverse effects on ICT integration.

4.3.11 Age of Heads of Departments

The heads of departments were required to indicate their age brackets. The findings are shown in Table 4.12

Table 4.12 Age of Heads of Departments

Age bracket	Frequency (f)	Percentage (%)
31-40	20	50.0
41-50	16	40**.0**
51-60	4	10.0
Total	**40**	**100.0**

The above findings show that a majority of the heads of departments were 50 years and below. This is a positive attribute since they are of age to understand the benefits of ICT integration in their administrative work in their respective departments.

4.3.12 Professional qualifications of heads of departments

The researcher sought to determine the professional qualifications among heads of departments. The findings are as shown in Table 4.13

Table 4.13 Distribution of heads of departments by professional qualifications

Professional qualifications	Frequency (f)	Percentage (%)
Diploma	11	28.0
BEd	24	60.0
MEd	5	12.0
Total	**40**	**100.0**

4.3.13 Length of service of Heads of Departments

The researcher sought to find out the length of service among the heads of departments in their current work stations .The findings are shown in the Table 4.14

Table 4.14 Length of service Heads of Departments

Length of service	Frequency	Percentage (%)
1-4	12	30.0
5-9	14	35.0
10 and above	14	35.0
Total	**40**	**100.0**

From the findings, most heads of departments (over 70 percent) have stayed in their current station for over 5 years. This is a positive attribute since they have enough experience on ICT integration in school administration and the arising challenges.

4.3.14 Categories of departments

The researcher sought to determine the departments headed by the various heads of departments. The findings are shown in Table 4.15

4.15 Distribution of heads categories of departments

Departments	Frequency (f)	Percentage (%)
Dean of studies	11	28.0
Guidance & counseling	2	5 .0
Science	4	10.0
Technical	6	15.0
Humanities	6	15.0
Languages	5	12.0
Math	6	15.0
Total	**40**	**100.0**

From the findings, at least all the departments in secondary schools participated in this study. This is a positive a positive trait since the various heads of departments were in a position to reveal their varied experiences concerning ICT integration as well as the arising challenges in the various departments. Additionally, a majority (28 percent) were deans of studies who are solely charged with on line K.C.S.E registration of students, preparation and maintenance of students' report cards as

well as preparation of school timetable among other administrative duties in their respective schools.

4.4 How principals use ICT in school administration

Maki (2008) stipulates that ICT integration plays a vital role in supporting powerful and efficient management and administration in the education sector. As such, the researcher sought to find out the administrative tasks carried by principals using ICT resources. The findings are as shown in Table 416

Table 4.16 Distribution of principals responses on administrative tasks involving students and teachers

Key responses : 1.Strongly Agree2. Agree 3.Disagree 4. Strongly Disagree

Statement	Agree (%)	Strongly Agree (%)	Disagree (%)	Strongly Disagree(%)
Maintenance of B.O.M minutes	20	60	20	0
Maintenance of School supplies records	30	50	10	10
Preparation of workers' payroll	60	30	10	0
Preparation of Students 'fee payment	50	40	0	10
Maintenance of teachers' performance records	50	30	10	10

N=10

From the findings, generally, most principals agree that they integrate ICT in maintenance of Board of Management (60 percent), maintenance of school supplies records (50 percent), preparation of workers' payroll (60 percent), preparation of students fees payment records (50 percent) and maintenance of teachers performance records (50 percent). This is in agreement with Maki (2008) whose findings revealed that ICT integration is essential for personal administration, student administration, resource administration, financial administration and general administration. It is also in agreement with Choralambous and Loannou (2008) findings that if school administrators used ICT tools and resources in school administration, they will encourage their followers particularly deputy principals and heads of departments to integrate ICT in their administrative tasks. This will in effect make school administration easier.

4.8 Administrative tasks performed by Deputy Principals using ICT

The researcher sought to find out the administrative tasks that the deputy principals performed using ICT resources. The findings are as shown in Table 4.17

Table 4.17 Distribution of administrative tasks performed by deputy principals using ICT

Tasks	Frequency (f)	Percentage (%)
Analysis of exam results	2	20.0
Student registration	2	20.0
Maintenance of financial and B.O.M records	2	20.0
Preparation of duty Rota and school time tables	2	20.0
Integrated teaching and learning	1	10.0
Communication	1	10.0
Total	**10**	**100.0**

From the findings, all the deputy principals use ICT tasks to perform any one of the above asks at any given time. This is encouraging since they are enthusiastic about ICT integration in not only school administration but also teaching and learning in the backdrop of few ICT resources. All of them actually use ICT resources for such administrative as student registration (20 percent), maintenance of financial records (20 percent) preparation of duty Rota and school timetable (20 percent), examination analysis at 20 percent and communication at 10 percent.This shows that school administration is a key determinant for the

realization of desired outcomes and success in schools and hence it is viewed as critical by all education stakeholders (Buabeng, 2012)

4.9.2 Frequency of Heads of Departments' use of ICT resources in administrative tasks

Heads of departments are very important for effective administration of schools since they carry out very important duties and responsibilities. As such, the researcher sought to find out how often they use ICT resources in carrying out their various administrative tasks. The findings are shown in Table 4.18

Table 4.18 Distribution of tasks performed using ICT resources by heads of departments

Administrative tasks	Daily	Weekly	Occasionally	Never
Master timetable preparation	5	0	60	35
Report cards preparation	0	0	90	10
Maintenance of students'	5	33	62	0
Performance records				
Preparation of lesson notes	5	20	68	6
Preparation of exam timetable	0	13	60	27

N= 40

The findings reveal that most heads of departments (90 percent) occasionally used ICT tools in report cards preparation,68 percent use in preparation of lesson notes,62 percent in master time table and exam timetable preparation. This is an encouraging trend since these heads of department are enthusiastic about ICT integration in school administration, an attribute that makes school administration easier. This confirms Maki (2008) findings that ICT integration plays a vital role in supporting powerful and efficient management and administration in the education sector.

4.5 School Principals 'mobilization of ICT resources and integration of ICT in school administration

The researcher sought to establish the extent to which principals have mobilized ICT resources in their schools. The findings are as shown in Table 4.19

Table 4.19 Mobilized ICT resources according to principals

ICT Resources	Not Available	Moderately Available	Highly Available
Photocopiers	40	40	20
Computers	80	20	0
Scanners	60	40	0
Printers	70	20	10
Internet	80	20	0

N= 10

From the findings, a majority (80 percent) of the principals reported that computers and the internet are not available in their schools while 70 percent and 60 percent of the principals reported that their school did not have printers and scanners respectively. This is in agreement with findings by Computer for Schools (2007) which revealed very few public secondary schools in Keya have enough ICT tools and resources for general school administration. Consequently, ICT integration in school administration cannot be achieved effectively

4.7 Deputy principals responses on mobilized ICT resources

The researcher sought to find out from the deputy principals the extent to which ICT resources have been mobilized in their schools. The findings are shown in table 4.20

Table 4.20 Deputy Principals' responses on mobilized ICT resources

ICT resources	Not mobilized	Moderately mobilized	Highly mobilized
Computers	80	20	0
Scanners	60	40	0
Photocopiers	20	30	50
Internet	80	20	0
Printers	60	20	10

N=10

Most deputy principals (80 percent) reported that their schools had no computers and the internet while 60 percent reported that there were no scanners and printers in the schools they served. Similar reports were made by the principals. This makes ICT integration in school administration slow to implement. This is in agreement with findings by Aduwa,et.al.,(2005) which revealed that many developing countries in Africa are still slow in ICT integration.

4.10 Heads of departments responses on Mobilized ICT resources

The researcher sought to establish the availability levels of ICT resources among heads of departments. The findings are shown Table 4.21

Table 4.21 Distribution heads of departments on mobilized ICT resources

ICT resources	Not available	Moderately Available	Highly available
Computers	85	15	0
Scanners	62	27	11
Photocopiers	36	62	2
Internet	80	20	0
Printers	72	16	12

N = 40

A majority of the heads of departments (85 percent) reported that there were no computers, 80 percent reported there were no internet services and 72 percent reported that there were no printers in their schools. This is discouraging since it interferes in effective integration of ICT in schools administration yet, according to Visscher (2003) and Tearle (2004), school administrators require facilitation with appropriate ICT tools and related infrastructure to optimize integration in their administrative duties.

4.5.1 Activities by principals using ICT

The researcher sought to find out the activities that principals perform using ICT resources. The findings are shown in Table 4.22

Table 4.22 Distribution of activities performed by principals using ICT resources

Activities	Frequency (f)	Percentage (%)
Data analysis	1	10.0
Records maintenance	2	20.0
Internet and email	1	10.0
On line registration Of K.C.S.E	6	60.0
Total	**10**	**100.0**

The findings reveal that a majority of principals, (60 percent) use ICT resources to register K.C.S.E candidates online in line with KNEC requirements, 20 percent use the same resources to maintain important school records, while 10 percent use it for data analysis and email and internet services. Findings from informal interviews revealed that these activities are performed by either the secretaries or the dean of studies on behalf of the principals. This confirms Flanagan (2003) findings which reveal that in many secondary schools informal ICT leaders have emerged from classrooms, libraries and computer labs to take up administration tasks.

4.4.1 Obstacles faced principals in ICT integration in school administration

The researcher sought to find out the obstacles faced by principals in their quest to integrate ICT in school administration. The findings are as shown in Table 4.23

Table 4.23 Distribution of obstacles faced by principals in ICT integration in school administration

Obstacles	Frequency (f)	Percentage (%)
Power outages	2	20.0
Computer illiteracy	2	20.0
High maintenance cost	2	20.0
Lack of enough computers	2	20.0
Slow internet connectivity	2	20.0
Total	**10**	**100.0**

From the findings it is evident that all the principals indicate power outages, computer illiteracy, high ICT resources maintenance costs, lack of enough computers and slow internet connections as the main obstacles that hinder ICT integration in school administration. This is in line with findings by Ayodo (2009)

which revealed that a majority of school principals were ill equipped to integrate ICT in school administration due to lack of adequate computers in schools, lack o of educational application trainings and policy strategies on how integration is done (Oloo, 2009), as well as frequent power disruptions and high levels of poverty (Farrel,2007).

4.8.1 Challenges face by Deputy Principals in ICT integration in school administration

ICT integration in school administration is higher than that of the principals. The researcher therefore sought to find out the challenges that the deputy principals face in their quest to integrate ICT in school administration. The findings are shown in Table 4.24

Table 4.24 Distribution of challenges facing deputy principals in ICT integration in school administration

Challenges	Frequency (f)	Percentage (%)
Power outages	4	40.0
High maintenance costs	1	10.0
Lack of enough computers	4	40.0
Lack technical support	1	10.0
Total	**10**	**100.0**

From the findings, most deputy principals, 40 percent, reported that their school lacked enough computers and suffer frequent power outages in equal measure, while 10 percent reported that high maintenance costs and lack of technical support. Non formal interviews with them confirmed that when a computer broke down, it took a long time before it was repaired due to the high repair charges by the technicians.ICT integration is therefore still low. These findings agree with Farrel (2009) whose findings indicated that lack of computers, limited rural electrifications and frequent power disruptions resulted to limited access to ICT integration in public secondary schools.

4.6 Principals' accessibility to ICT resources and ICT integration in school administration

The researcher sought to find out from the principals the extent to which ICT resources are accessible in their school. The finding are shown in Table 4.25

Table 4.25 Principals accessibility to ICT resources

Extent of accessibility	Frequency (f)	Percentage (%)
None	6	60.0
Little extent	3	30.0
Moderate extent	1	10.0
High extent	0	0.0
Total	**10**	**100.0**

Access to ICT infrastructure and resources in secondary schools is a necessary condition to the integration of ICT in school administration (Plomp, Anderson, Law & Quale, 2009). However, findings from this study reveal that a majority of the principal (60 percent) never access any ICT tool and resources**.** This could be as a result of their poor ICT literacy levels as reported by 60 percent of them as well as inadequate ICT resources and related infrastructure such as computers and internet as reported by 80 percent of the principals. These findings are in

agreement with those of Computer for Schools (2009), which point to low access to ICT facilities in public secondary schools.

4.7.1Responses from Deputy Principals on the extent of access to ICT resources

Having established that the extent of mobilized ICT resources in schools was low, the researcher sought to establish the extent of access to these ICT resources by the deputy principals. The findings are as shown in Table 4.26

Table 4.26 Distribution of deputy principals by the extent access to of ICT resources

Extent of Access	Frequency (f)	Percentage (%)
Not at all	0	0.0
Little extent	2	20.0
Moderately extent	1	10.0
High extent	7	70.0
Total	**10**	**100.0**

Most of the deputy principals, (70 percent), reported that they access and use ICT resources despite their low availability. This is quite encouraging since it shows that they are enthusiastic towards ICT integration in school administration.

4.11 Accessibility of ICT resources and integration in school administration by heads of departments

The researcher sought to establish whether ICT resources were accessible to the heads of departments so as to perform various administrative tasks using them. The findings are shown in Table 4.27

Table 4.27 Distribution of tasks performed by heads of departments using ICT resources

Tasks	Frequency (f)	Percentage (%)
Preparation of lesson notes	5	13.0
Downloading information	10	25.0
Maintenance of records	8	20.0
Analysis of results	3	8.0
Communication through face book	3	8.0
ICT integration in teaching	7	18.0
Registration of students	4	10.0
Total	**40**	**100.0**

The findings indicate that despite lack of enough ICT resources, heads of departments still access them to carry out various tasks such as preparation of lesson notes (13 percent), downloading information (25 percent), maintenance of records (20 percent) results analysis (8 percent), communication through face book (8 percent), registration of students (10 percent) and integration in teaching at 18 percent. This is quite encouraging since it is a clear indication that these

school administrators are enthusiastic towards ICT integration in school administration. This is in agreement with Choralambous and Loannou (2008) whose findings revealed that if school administrators, for example, are enthusiastic towards ICT integration, they will encourage their followers to integrate ICT in their administrative tasks which will in effect make school administration easy.

4.11.1 Challenges facing heads of department in ICT integration in school administration

It is already an established fact that heads of departments in the schools being studied are enthusiastic towards ICT integration in school administration despite lack of enough of these ICT resources. Hence, the researcher sought to determine the challenges they face in their quest to integrate ICT in their various tasks. The findings are as shown in Table 4.28

Table 4.29 Distribution of challenges facing heads of departments in ICT integration in school administration

Challenges	Frequency (f)	Percentage (%)
Lack of computer literacy	5	13.0
Power outages	7	18 .0
Slow internet connectivity	6	15.0
Lack of technical support	13	31.0
High maintenance costs	5	13.0
Lack of enough ICT resources	4	10.0
Total	**40**	**100.0**

There is a myriad of challenges interfering with effective ICT integration among heads of departments as reported by the various heads of department. The biggest challenge as reported by a majority of them at 31 percent is lack of technical support From the non formal interviews, the heads of departments reported that they have no time and technical skills to set up ICT tools for the purposes of integration in teaching and learning, printing, scanning and photo coping materials. Other challenges include power outage (18 percent), slow internet connectivity (15 percent), lack of computer literacy and high maintenance costs

at 13 percent each as well as lack of enough ICT resources at 10 percent. These challenges seemed to greatly interfere in effective integration of not only teaching and learning but also school administration among them. These findings are in agreement with Gray and Smith (2007) whose findings revealed that the twenty first century school administrator faces numerous challenges emanating from ICT integration.

4.7 Principals' ICT literacy

Having confirmed that the principals delegated ICT related tasks to secretaries and deans of studies, the researcher sought to find out the level of ICT literacy among principals. The findings are as shown in Table 4. 30

Table 4.30 Principals by ICT literacy

Computer programs	None	Little	Moderate	High
Microsoft word	0	60	20	20
Microsoft Excel	0	70	20	10
PowerPoint	30	60	10	0
Email and Internet	20	60	20	0

N= 10

The findings a reveal that a majority of principals have little computer literacy in Microsoft word (60 percent), PowerPoint (60 percent) and email and internet at

60 percent and Microsoft excel at 70 percent and therefore cannot effectively implement ICT integration in school administration. It is also discouraging to note that 30 percent and 20 percent of the principals were illiterate in as far as PowerPoint and email and internet respectively are concerned. Non formal interviews with these principals revealed that they depended on the school secretaries to access the internet for them. This is a confirmation by Stuart (2009) whose findings revealed that although technology leadership responsibilities may have been assigned formally to school principals, most of them do not have suitable training or background to feel confident in dealing with technology.

4.9 ICT literacy among Deputy Principals

Having established the challenges facing deputy principals in ICT integration in school administration, the researcher sought to establish the level of ICT literacy among the deputy principals. The findings are shown in Table 4.31

4.31 Distribution of ICT literacy levels among deputy principals

ICT literacy	Poor	Little	Moderate	High
Microsoft word	0	90	10	0
Microsoft excel	0	60	40	0
Power point	0	80	20	0
Internet and email	10	60	30	0

The findings indicate that a majority of the deputy principals have little ICT literacy in Microsoft word (90 percent), Microsoft excel (60 percent), PowerPoint (80 percent), internet and email (60 percent), just like their principals who have been formerly assigned the role of ICT leadership. This badly hurts ICT integration in school administration. Informal interviews with the deputy principals confirmed that majorities have never gone for formal training in ICT integration and therefore they learn on the job. There is need for them to be trained on ICTs so that they become effective in school administration.

4. 9.1Deputy Principals' responses on benefits of being ICT literate

Having confirmed the ICT literacy levels among deputy principals is little, the researcher sought to find out how beneficial ICT literacy is to them .The findings are as shown in Table 4.32

Table 4.32 Distribution of deputy principals' responses on benefits of ICT literacy

Benefits	Frequency (f)	Percentage (%)
Good data storage	2	20.0
Confidentiality of information	1	10.0
Fast access to information	5	50.0
Making teaching lively	2	20.0

N= 10

From the findings, a majority of the deputy principals, 50 percent, feel that ICT literacy is beneficial in that it enables them to access information fast,20 percent feel that ICT enables them to store data and make teaching lively while 10 percent are able to secure confidentiality of their information. This is in agreement with Willey (2003) whose findings indicated that school administrators need effective and fast communication and accessibility to information by corresponding through email and internet, create websites for school marketing, communicate with parents, other school administrators, school suppliers and the wider school community.

4.12 ICT literacy levels of heads of departments for ICT integration in school administration

The researcher went on to find out their literacy levels in different ICT areas. The findings are shown in Table 4.32

Table 4.31 Distribution of heads of departments by ICT literacy levels

Computer programs	Poor	Little	Moderate	Excellent
Microsoft Word	38	43	18	1
Microsoft Excel	43	48	9	0
Microsoft PowerPoint	50	35	15	0
Internet and Email	13	45	28	14

N =40

From the findings, a majority of heads of department, (38 percent) are poor in Microsoft, 43 percent are poor in Microsoft excel, 50 percent are poor in PowerPoint and 13 percent are poor in email and internet. This is a negative attribute which is not conducive for effective ICT integration in school administration. Therefore there is need to intensively train heads of departments in ICT integration in school administration as recommended by Dexter (2005) that professional development opportunities should be provided for school administrators to promote their level of ICT integration and to increase their productivity.

4.12.1 Responses from heads of departments on importance of being ICT literate

Having confirmed that most heads of departments have inadequate ICT literacy, the researcher sought to establish the importance of being ICT literate. The findings are shown in Table 4.33

4.33 Distribution of heads of departments' responses on importance of being ICT literate

Response	Frequency (f)	Percentage (%)
Fast access to information	14	35.0
Makes work easier	13	33.0
Entertainment	2	5.0
Effective teaching and learning	4	10.0
Safe storage of information	4	10.0
Effective school administration	3	8.0
Total	**40**	**100.0**

On average, this study has established that most of the heads of departments are of little computer literacy. However this does not deter them from performing some tasks using ICT resources. This could be the reason a majority of them (35 percent) have reported that the major benefits reaped from ICT integration are fast access to information, 5 percent use ICT for entertainment, 10 percent find ICT making teaching and learning effective as well as enabling them to safely store data and making work easier at 33 percent. This is a sharp contrast with ICT integration in school administration which is at 3 percent. This is in line with OECD (2011) whose findings reveal the need for far sighted school leadership which is needed to bring and sustain the dramatic changes enabled by ICT integration, to persuade and give confidence to all involved.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter comprises the summary of the study, summary of the findings of the study and conclusions drawn from the findings of the study. Recommendations made from the study findings and suggestions for further research are also presented.

5.2 Summary of the study

The purpose of this study was to establish the factors that influence principals' integration of information communication technology in administration of public secondary schools in Githunguri Sub County, Kiambu County, Kenya. The study was guided by four research objectives which were formulated by the researcher. These objectives were; to examine how principals use ICT, to establish the extent to which school principals have mobilized ICT resources and related infrastructure, to establish the extent to which principals' accessibility to ICT infrastructure and to determine the extent of school principals' ICT literacy influences integration of ICT in school administration in public secondary schools.

The study adopted a descriptive survey design to gather both qualitative and quantitative data. The sample population for this study was 10 public secondary

schools, 10 principals, 10 deputy principals and 40 heads of departments. Data was collected using questionnaires for the principals, deputy principals and heads of departments.

5.3 Summary of the findings

The first objective sought to establish how school principals use ICT in school administration. The findings revealed that ICT integration by school principals is rare in that they delegate matters requiring the use of ICT resources to school secretaries and deans of studies. Principals have therefore delegated ICT leadership to others in the schools instead of actually leading in ICT leadership.

The second objective sought to establish the extent to which mobilized ICT resources influence ICT resources in school administration. This study established that most schools lacked such ICT resources as computers as reported by 80 percent of the principals and deputy principals as well as 85 percent of the heads of departments. Most schools also lacked internet services as reported by 80 percent of the principals, deputy principals and heads of departments. This derailed the ICT integration in school administration to a great extent.

The third objective sought to examine the extent to which accessibility of ICT resources influenced ICT integration in school administration. Most of the principals, 60 percent have no access to ICT resources since they delegate tasks involving ICT use to the school secretaries or deans of students. It is encouraging to note that a majority of the deputy principals, 70 percent highly access ICT

resources in a bid to carry out such administrative tasks as downloading information (25 percent), records maintenance, (20 percent and students registration at 10 percent despite the fact that they share the few ICT resources due to their scarcity.

The fourth objective was out to establish the extent to which ICT literacy influenced ICT integration in school administration. The findings revealed that most principals, 80 percent, had little ICT literacy in Microsoft word, 60 percent in Microsoft excel, 70 percent in power point and 60 percent in internet and email. Also a majority of the deputy principals had little in micrososft word This literacy level is too little to enable them a effectively integrate ICT in school administration. This is despite the fact that technology leadership may have been assigned formally to school principals most of whom do not have suitable training or background to feel confident in dealing with technology. Findings from heads of departments attest to this when they reveal that over 38 percent of them have poor ICT literacy levels in all the ICT areas.ICT integration in school administration gets worse down the administrative cadre.

Most of the public secondary schools lacked adequate ICT resources and related infrastructure thereby greatly influencing ICT integration in school administration. This is as reported by over 60 percent of the principals, deputy principals and heads of departments. Informal interviews with deputy principals revealed that these resources were so few that they scrambled to use them with the

secretaries, teachers and heads of departments. This explains why many developing countries in Africa are still slow in ICT integration.

Technical challenges also influenced ICT integration in school administration to a great extent. All the principals unanimously reported that power outages, computer semi literacy, high maintenance costs, lack of enough computers and slow internet connections were the main challenges that derailed effective ICT integration in secondary schools. All the deputy principals reported that power outages computer illiteracy, high maintenance costs slow internet connectivity and lack of adequate computers as the main challenges while a majority of the heads of departments, 31 percent, reported lack of time and technical support as the greatest challenges. Informal interviews with them revealed that they actually lacked adequate time and technical skills to set up ICT resources for the purposes of ICT integration in teaching and learning through power point as well as, printing, scanning and photocopying materials.

5.4 Conclusions of the study

Several factors stood out as the main contributors towards poor ICT integration in public secondary school administration. These comprised delegation of tasks requiring ICT use to the school secretaries and deans of studies. Secondly this study has established that very few ICT resources have been mobilized by the principals. As such, most of the schools involved in this study lacked computers interne services, scanners and photocopiers which are critical towards ICT

integration. The deputy principals and heads of departments have been depicted to have been accessing ICT resources more often than the principals despite these resources being inadequate. The deputy principals use ICT resources to perform such administrative tasks as student registration, downloading of information and maintenance of important data while the heads of departments use the same resources to prepare exam and master time table, prepare report cards, maintain records and register students. Although all the respondents have reported to have little ICT literacy, the worst hit being the school. The study therefore established that school administrators were ill prepared to integrate ICT in school administration as a result of ICT illiteracy and poor access especially among principals, inadequate ICT resources and related infrastructure and lack of technical support especially among heads of departments.

5.5 Recommendations of the study

From the foregoing, it is evident that ICT integration in public secondary schools in Githunguri Sub County is generally very poor. To reverse this trend, the researcher makes the following recommendations:

i. The principals of public secondary schools should interact more with ICT resources so as to be familiar with the challenges arising from using them as well as the benefits accrued from using them such as effective ICT integration in school administration.

ii. The Ministry of education in collaboration with such other organizations as Computer for Schools, should provide enough ICT resources to schools for easy access and effective ICT integration in school administration

iii. For easy access to ICT resources, public schools should avail ICT technicians so as to ensure continuous and smooth use of these resources for the purposes of effective school administration.

iv. The Ministry of Education in conjunction with the Kenya Institute of Curriculum Development should come up tailor made programs exclusively for school administrators so as to impart relevant skills, attitudes and knowledge in ICT integration in school administration

5.6 Suggestions for further research

This study sought to establish the factors that influenced school principals' integration of information communication technology in public secondary schools in Githunguri Sub County, Kiambu County, Kenya. Following the research findings, the researcher makes the following suggestions for further research:

i. A study on factors influencing head teachers' integration of Information Communication Technology in school administration in public primary schools.

ii. A study on effectiveness ICT training among school administrators on ICT integration in public secondary schools.

iii. A study on influence of ICT integration in teaching and learning on student academic achievements in public secondary schools.

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APPENDIX I

LETTER OF INTRODUCTION

University of Nairobi

P.O BOX 30197

Nairobi.

Dear Sir/Madam,

Re: Factors Influencing School Principals in ICT integration in School Administration in Githunguri Sub County, Kiambu County, Kenya.

I am a post graduate student at the University of Nairobi. I would like you to permit me to collect data from your school for the purposes of fulfilling the requirements for the award of the Degree of Master of Education in Education Administration. Any assistance accorded to me will be highly appreciated.

Yours Faithfully,

Muchiri George Mbatia

APPENDIX II

PRINCIPALS' QUESTIONNAIRE

Please respond to the items given as honestly and as accurately as possible. All your responses will be treated with utmost confidentiality. Read each statement carefully and tick against the appropriate answer. Fill the blank spaces with appropriate information**.**

Section A: Demographic information

1. What is your gender? Male [ ] Female [ ]
2. What is your highest level of education? Med [ ] Bed [ ] Ded [ ] others (specify)
3. Indicate your length of stay in your current station.
4. What is your age bracket? 31-40 [ ] 41-50 [ ] 50 and above [ ]

Section B: How Principals use ICT and its integration in school administration

5. The following are some of the administrative tasks involving students and teachers in your school using ICT. Using a tick, rate yourself on a five point scale. 1. Strongly agree 2.Disagree 3.Not sure 4.Agree 5.Strongly disagree

Administrative tasks	Strongly Agree	Agree	Not sure	Agree	Strongly agree
Maintenance of B.O.M Meetings					
Maintenance of school supplies records					
Preparation of workers' payroll					
Preparation of students' fee payments					
Maintenance of teachers' performance records					

6. What obstacles do you as an administrator face in the performance of the above tasks? List all

Section C: Mobilized ICT infrastructure and integration in school administration

7. The following is a list of ICT resources which are key to effective school administration. Using a tick, Indicate the extent to which they are available their availability.

ICT resources	Not Available	Available	Highly available
Computers			
Scanners			
Printers			
Internet			

8. If they are available list all the activities that you perform using them

Section D: Accessibility of ICT infrastructure and integration in school administration

9. Are ICT resources accessible in your school for administrative purposes? Yes [ ] No [ ]
10. If yes, to what extent are they accessible? Never [ ] Less accessible Moderately accessible [ ] Highly available [ ]

Section E: Principal's ICT competence and ICT integration in secondary school administration

11. The following is a list of computer programs available in a secondary school administration setting. Tick the extent of your proficiency in the following

Computer programs	None	Little	Moderate	High
Microsoft word				
Microsoft excel				
Microsoft power point				
Internet and email				

12. If you are at least proficient in using ICT resources, what are some of the benefits?

APPENDIX III

QUESTIONNAIRE FOR DEPUTY PRINCIPALS

Please respond to the items given as honestly and as accurately as possible. All your responses will be treated with utmost confidentiality. Read each statement carefully and tick against the appropriate answer. Fill the blank spaces with appropriate information**.**

Section A: Demographic information

1. What is your gender? Male [ ] Female [ ]
2. What is your age bracket? 31-40 [ ] 41-50 [ ] 51-60 [ ]
3. What is your length of stay in the current station?
4. What is your highest level of education? MED [ ] BED [ ] DED [ ]

Section B: How Deputy Principals' use ICT and its integration in school administration

5. The following are some of the administrative tasks involving students and teachers in your school. Using a tick, indicate how frequently you perform the following administrative tasks

Administrative tasks	Daily	Weekly	Occasionally	Never
Preparation of school time table				
Maintenance of students' discipline records				
Preparation of lesson notes, lesson plans record of work				
Maintenance of teachers' attendance records				
Maintenance of teachers leave and sick off applications				

6. If you never use ICT resources in performing administrative purposes , what are some of the reasons?

Section C: Mobilized ICT infrastructure and ICT integration in school administration

7. The following is a list of ICT resources which are key to effective school administration. Using a tick Indicate the extent of their availability.

ICT resources	Not Available	Moderately Available	Highly available
Computers			
Scanners			
Photocopiers			
Internet			
Printers			

8. **Section D: Accessibility to ICT infrastructure and integration in school administration**
9. List all the tasks that you perform using ICT resources.
10. What challenges do you face as you use these resources?

Section E: ICT competence and ICT integration in school administration

11. The following is a list of computer programs available in a secondary school administration setting. Tick the extent of your proficiency in the following

Computer programs	**Not at all**	**Average**	**Moderate**	**High**
Microsoft word				
Microsoft excel				
Microsoft power point				
Internet and email				
Others				

12. What are the benefits of being ICT literate?

APPENDIX IV

QUESTIONNAIRE FOR HEADS OF DEPARTMENTS

Please respond to the items given as honestly and as accurately as possible. All your responses will be treated with utmost confidentiality. Read each statement carefully and tick against the appropriate answer. Fill the blank spaces with appropriate information**.**

Section A: Demographic information

1. What is your gender? Male [ ] Female [ ]
2. What is your age bracket? 31-40 [ ] 41-50 [ ] 51-60 [ ]
3. What is your length of stay in the current station?
4. What is your highest level of education? MED [ ] BED [ ] DED [ ]
5. Which department do you head?

Section B: How H.O.DS' use ICT and its integration in school administration

6. The following are some of the administrative tasks involving students and teachers in your school. Using a tick, indicate how frequently you perform the following administrative tasks

Administrative tasks	Daily	Weekly	Occasionally	Never
Preparation of school time table				
Preparation of student' report forms				
Maintenance of students' performance records				
Preparation of lesson notes				
Preparation of examination timetables				

Section C: Mobilized ICT infrastructure and ICT integration in school administration

6. The following is a list of ICT resources which are key to effective school administration. Using a tick Indicate their availability.

ICT resources	Not Available	Available	Highly available
Computers			
Scanners			
Photocopiers			
Internet			
Printers			

Section D: Accessibility to ICT infrastructure and integration in school administration

7. List all the tasks that you perform using ICT resources.
8. What challenges do you face as you use these resources

Section E: H.O.Ds ICT competence and ICT integration in school administration

9. The following is a list of computer programs available in a secondary school administration setting. Tick your proficiency in the following

Computer programs	**Poor**	**Average**	**Good**	**Excellent**
Microsoft word				
Microsoft excel				
Microsoft power point				
Internet and email				
Others				

10. Is being ICT literate important? Give reasons