INFLUENCE OF SCHOOL LEADERSHIP IN INTEGRATION OF INFORMATION COMMUNICATION TECHNOLOGY IN TEACHING AND LEARNING IN PUBLIC SECONDARY SCHOOLS: A CASE OF BUURI SUB-COUNTY, MERU, KENYA

BY

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DECLARATION

I declare that this research report is my original work and that it has not been submitted in any university or institution for academic award.

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DEDICATION

I dedicate this study to my son Alba and to my mother Pilliah for the continued support they gave me when doing this research.

ACKNOWLEGMENT

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ABBREVIATONS AND ACRONYMS

ADSL: Asymmetric Digital Subscriber Line

CFSK: Computer for Schools Kenya

EDGE: Enhanced Data Rates for GSM

GPRS: General Packet Radio Service

ICT: Information Communication Technology.

IS: Information System

ISDN: Integrated Service Digital Network

ISPS: Internet Service Providers

ITU: International Telecommunication Union

MoE: Ministry of Education

SBM: School Based Management

SITES: Second Information Technology in Education Study.

TUK: Technical University of Kenya

UNESCO: United Nations Educational Scientific and Cultural Organization

ISTE: International Society for Technology in Education

KESSP: Kenya Education Sector Support Program.

NGOs: Non-Governmental Organizations

ISPs: Internet Service Providers

HoD: Head of Department

MIS: Management Information System

ABSTRACT

The study was an investigation of the influence of school leadership in integration of information communication technology in teaching and learning in public secondary schools in Kenya. The study was a case of Buuri Sub-county of Meru County. Certain factors that are pertinent to characteristics of the school can have significant impact in influencing the use of ICT skills in learning and teaching opportunities in school environments. The Objectives of the study included to establish the influence of school leadership technical support, ICT policy support, school leadership support for infrastructures and the influence of school leadership support for staff skills development on the integration of ICT in teaching and learning. The study was based on the School Based Management (SBM) model which is primarily strategy to decentralize decision making to the individual school site. The research design was descriptive survey research and involved the collection of data concerning the influence of school leadership on the implementation of ICT in teaching and learning. The research was conducted on the public secondary school in Kenya, Meru County in Buuri sub-county. Buuri sub- County has a total of 29 public secondary schools. Stratified and simple random sampling was used. The simple random sampling was applied on 29 schools to get strata of 9 schools while stratified random sampling was used to select respondents. All the study variables were analyzed by use of non-parametric spearman's correlation co-efficient inferential statistical tools as the measurement of the responses is at nominal and ordinal scale, while descriptive statistical analysis measures of central tendency and dispersion was adopted for section 'A' of the questionnaire which generate the general background information of the respondents. The study established that school leadership technical support had no influence on integration of ICT in teaching and learning in secondary schools. The study also established that school leadership support for infrastructures, school leadership support for staff skills development and school leadership support for ICT policy had influence on integration of ICT in teaching and learning in secondary schools. It is recommended that more awareness should be made by the bodies that are charged with policy so as to increase the involvement as most had little to offer on the influence of policies in the integration of ICT in teaching and learning in secondary schools.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Information and Communication Technology(ICT) is used as an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems, as well as the various services and applications associated with them, such as videoconferencing and distance learning (Ang'ondi 2010).The need and urgency for developing technological literacy, although not a new idea, emerged with greater emphasis in the early 1980's. With this increasing awareness and interest, technology quickly was recognized as a powerful vehicle for offering educators innovative ways to enhance student learning. In the early 1990's the International Society for Technology in Education (ISTE) established standards defining technological literacy for teacher education (Aktaruzzaman, Shamin, Clement, 2011). Today ICT facilitates not only delivery of instruction, but also learning process itself. Moreover, ICT promotes international collaboration and networking in education and professional development. There's a range of ICT options: from videoconferencing through multimedia delivery to web sites which can be used to meet the challenges teachers face today. In fact, there has been increasing evidence that ICT may be able to provide more flexible and effective ways for lifelong professional development for today's teachers (Jung, 2005).

ICT enters school environment progressively, with the objective of adopting technological applications in the teaching and learning process, monitoring of students' progress, school administration and the management of the school as a whole. It can be examined as an administrative and management tool, as a teaching tool medium, learning object and as a learning tool (Keiyoro, Gakuu, Kidombo, 2011).

ICT policies in the East African Community began taking shape in the early 2000s before then; there had been an increase in unregulated use of ICTs that prompted the need for governments to offer direction in the use of these technologies. According to the info Dev report, quoted in Farrell and Isaacs (2007), the initial ICT policies were comprehensive

and included all sub-sectors of the education system. However, the formation of the policies has been a long and complicated process (Ang'ondi 2010).

Kenya has put in place measures to enhance the integration of ICT in education, in 2004, the government established Kenya ICT Trust Fund whose aim was to spearhead ICT, it was to facilitated public private partnership that is will initiate and provide ICT resources to Kenyan public schools and community resources and learning centers. In 2005 the ministry of education established Kenya Education Sector Support Program (KESSP) which featured the integration of ICT into teaching and learning process in Kenyan schools. In 2006 there was establishment of National ICT policy which was to ensure affordable ICT services to Kenyans.

Despite these efforts put in place by the government a lot of research (Khan et al 2012, Menjo and Boit, 2012, Hennessy, 2010) show that the integration of ICT into teaching and learning has not been fully implemented. Among the factors identified by these researches include limited electrification and power disruption, lack of adequate connectivity and network, financial problems and inadequate teachers with skills. Andoh, (2012) found that teacher-level factors, school-level factors and system-level factors determined implementation of ICT in schools. Implementation of ICT in schools is also influenced by organizational factors, teachers and leaders attitudes towards technology and other factors (Laaria, 2013; Manduku et al, 2012; Makhanu, 2010). As ICT becomes further integrated into the curriculum, the talents and interests of students and teachers will be nurtured not only by those with who they are in direct daily contact, but also by a broader community of fellow learners' world-wide. This transformation has already begun in classrooms that effectively harness ICT for learning (Nova Scotia, 2005).

1.2 Statement of the Problem

ICT is any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems, as well as the various services and applications associated with them, such as videoconferencing and distance learning (Ang'ondi 2010). The introduction of information and communication technology (ICT) in educational institutions is considered part of the technological modernization of administration and education, (Keiyoro 2010).

The Kenyan Government, through its key ministries of Education, Science and Technology and Information and Communication Technology, has developed several policy and strategy documents to guide the integration of ICT in education (National ICT Policy, 2006; Sessional Paper No. 1 of 2005 and Kenya Education Sector Support Programme, 2005-2010) (Kidombo, Gakuu & Ndiritu 2012). Despite these efforts put in place, a major challenge to ICT integration in teaching and learning is the lack of qualified teachers and lack of funding and the rise of student population in schools, (Hennessey et al 2010). Study conducted by Laaria (2013) in Meru County indicated that inadequate infrastructures and poor maintenances as challenges faced by school leaders in the implementation of ICT in teaching and learning in schools. According to research findings, the integration of ICT in teaching and learning in Buuri sub-county has faced several challenges such as inadequate ICT infrastructures, inadequate technical support, and inadequate ICT skills among the teachers.

Certain factors that are pertinent to characteristics of the school can have significant impact in influencing the use of ICT skills in learning and teaching opportunities in school environments. These include the availability of ICT resources, training in ICT skills and school leadership (Keiyoro 2012). According to Makhanu and Kamper (2012), secondary school principals require access to ICT for a number of reasons such as; their need to adjust to the world of technology change, their need to embed ICT use in teaching and administrative duties and their professional studies. ICT reforms require consideration of issues such as budgeting, staffing, resourcing and training. Other considerations are such as building and managing ICT infrastructures (Afshari, Kamariah, Wong, Abu and Foo; 2008). This study therefore seeks to find out the influence of school leadership in the integration of ICT in teaching and learning.

1.3 The Purpose of the Study

The purpose of this study was to examine the influence of leadership in the implementation of ICT in teaching and learning in public secondary schools in Meru County, Buuri sub-county.

1.4 The Objectives of the Study

This study was guided by the following four objectives;

i) To establish the influence of technical support on the integration of ICT in teaching and learning

ii) To determine the influence of school leadership support for infrastructures on the integration of ICT in teaching and learning

iii) To examine the influence of school leadership support for staff skills development on the integration of ICT in teaching and learning

iv) To establish the influence of school leadership support for ICT policy on the integration of ICT on teaching and learning

1.5 Research Question

The research sought to answer the following questions;

i. In what ways does technical support influence the integration of ICT in teaching and learning?

ii. How does the school leadership support for infrastructures, influence the integration of ICT in teaching and learning?

iii. In what ways does school leadership support for staff skills development, influence the integration of ICT in teaching and learning?

iv. How does school leadership support for ICT policy influence the integration of ICT in teaching and learning?

1.6 The Significance of the Study

The findings of the research and recommendations were expected to provide a framework to help school principals in making decisions on how to implement ICT in schools. The study was also helpful to the government through ministry of education in the review of ICT policy, provision of in-service in ICT programmes and managerial skills among teacher and schools principals and the provision of refresher courses in ICT for teachers and school leaders. The study will also be helpful for to education training institutions such colleges and universities in the training of teaching and administration of application

of ICT in teaching and learning. The research was also to open areas for further study on the role the school leadership in the implementation of ICT in schools.

1.7 Delimitation of the Study

The study was conducted in public secondary schools in Buuri sub-county in Meru County. Buuri sub-county has a total of 29 public secondary schools. The study will focus on the influence of school leadership on the integration of ICT in teaching and learning. School principals, deputy principals, HoDs and students were the respondents.

1.8 Limitations of the Study

The unwillingness of the respondents to participate in the study during the individual interview was a major limitation. An in-depth interview was conducted with the participants who were willing to participate in the study. Another limitation was the logistic of reaching some respondents as most of the principals were out for the principal annual meeting in Mombasa. This was sorted out by waiting until the meeting was over and the principals were back at school.

1.9 The Assumptions of the Study

The study worked under these assumptions: the respondents would cooperate to give the information required. The information given by respondents would be true and accurate. There would be a high return of the sent questionnaires to respondents.

1.10 Definitions of Significant Terms

ICT infrastructure – These are components such as internet and connectivity, computers,

multimedia projectors, computer laboratories, computer hardware and software and electricity in the school that enhance ICT implementation.

ICT integration- Is the incorporation of technology devices such computers,

multimedia projectors, computer hardware and software into teaching and learning.

School leadership- Is the ability of the school principal to influence the availability of ICT infrastructure, technical support and coming up with ICT policy plans to enhance the integration of ICT into teaching and learning.

Technical support- Refers to a range of services such as advice, assistance, repair and maintenances provided to users of ICT infrastructure such as computers, software by the school leadership.

ICT policy is a plan of action adopted by the school leadership to ensure effective integration of ICT in teaching and learning

1.11 The Organization of the Study

This study was organized into five chapters namely; Chapter one explored the background on ICT, the problem statement, purpose of the study, research objectives, research questions, the significance the study, delimitation, limitation and the definition of significant terms. Chapter two reviewed existing literature relating to the study, theoretical framework and conceptual framework. Chapter three outlined the research design, target population, sampling procedure, research instruments, validity and reliability, method of data collection and data analysis, ethical issues and operational definition of variables. Chapter four described the analysis of the collected data, presentation and interpretation of data and chapter five outlined summary, discussions, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed different literatures on the influence of school leadership in the integration of ICT. The chapter looked at ICT in and for education, school leadership and ICT integration, theories in relation to ICT integration and finally the conceptual framework.

2.2 Information and Communication Technology in and for Education

Information and Communication Technology (ICT) refers to the tools used to create, store, retrieve, and disseminate information (using a variety of media, among them computer-based media); data and information systems; networks; interactive telecommunications systems; curriculum software; and some forms of assistive technology. ICT also includes calculators, audio and video recordings and broadcasts; still images; and projections (Scotia, 2005). The ways ICTs have been used in the education can be clearly divided into two broad categories: ICT for Education and ICT in Education. ICT for education refers to the development of information and communications technology specifically for teaching or learning purposes, while ICT in Education involves the adoption of general components of technologies in the teaching process often for the training of teachers in the use of technology for teaching (Olakulehin, 2007).

Pearson (2000) reports on various governments policy statements on the use of computers in schools. Such countries included United States of America, Britain, Australia, Hon Kong, etc. Pearson observed that to implement the ICT education policy. The government was committed facilitate universal access to ICT infrastructure in developing countries. In America the policy document included the provision of computers in schools to the ratio of one computer for ten students, and teachers were required to be trained and to be computer literate by taking computer courses (Zhao and Cziko (2001). The United Kingdom government has supplied every nursery school with an electronic whiteboard even (Miller et al., 2005; as cited in Waller, 2007).

Jaway (2003) observed that when developed nations are reaping the fruits of state of the art ICTs in their educational system, educational delivery in developing countries of Africa is solely based on student-teacher face-to-face contact. In Uganda, the Education sector is still heavily relying on traditional systems and severely lagging behind as far as new technologies are concerned (Kaweesa, 2002). Across Africa and most developing countries there are many challenges in bringing ICTs into the education process in general, (Hennessy et al 2010). In Nigeria lack of technical support in schools and teachers' lack of expertise in using ICT are the main factors hindering teachers' readiness to and confidence in using ICT (Tella et al 2007).

In Kenya Computer education was first introduced in public secondary schools in 1996 so that the students could learn computer literacy skills. The decision by the government to introduce computers in public secondary schools was influenced by two major educational resolutions and policies. The first one was in 1996 when the Ministry of Education announced that it had approached UNESCO to fund the project and train secondary school teachers to teach computers skills. The second one was when the Ministry of Education published a policy and curriculum guidelines in 1997 approving the teaching of computer education in secondary schools and announced that the subject would be examined in 1998 (Odera 2011).

In an effort to keep up with these new developments, the Kenyan Government, through its key ministries of Education, Science and Technology and Information and Communication Technology, has developed several policy and strategy documents to help the integration of ICT in education, such policy include: National ICT Policy of 2006, Sessional Paper No. 1 of 2005 and Kenya Education Sector Support Programme, 2005-2010 (Kidombo at el 2012).

Meoli (2007) revealed that despite efforts made by various stakeholders and the importance of ICT in education sector, the National ICT policy have to a large extent remained in draft form. No attempt is made to implement the policies to schools. Among the challenges facing ICT implementation are; lack of technical support (Laronde 2012). Keiyoro (2012) showed that 10.7% of the school sampled in the study had no power connectivity.

Oloo (2009) in his study, majority of the schools surveyed did not have internet connectivity. Kidombo et al (2012), in this study schools had inadequate computers and poor internet access. The availability of information and knowledge plays an important role in supporting rural school development and literacy with ICT. It also helps to promote the effectiveness and efficiency of school development projects. However, compared with developed countries, the use of ICT in the educational sector in developing countries is more limited, because of shortages of financial resources leading to limited Internet access and poor infrastructures. Moreover, they are also restricted in numbers of trained teachers and proper policies (Gulati, 2008).

2.3 School Leadership Support and ICT Integration

A number of studies have identified the school principal as an important person for establishing and maintaining learning environments compatible with student-centered approaches to teaching and learning with ICT (Afshari et al. 2008). According to Kidombo, Gakuu and Ndiritu (2012) school leaders are seen as curriculum and pedagogy leaders and are considered by stakeholders as central figures in leading processes in the use of ICT in teaching and learning. The competence of the School Manager in the use of ICT and a broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT use in education is important to the effectiveness. The study further states that acquisition of a limited number of computers initially by schools for management purposes created the conditions necessary to introduce and integrate ICT in teaching and learning.

The locus of leadership influences the degree to which ICT integration can become embedded in educational institutions as well as the role of leadership in championing ICT (Gichovi 2013). In order to effectively perform duties of school leadership, school leader's roles should be geared in using ICT in school. They should demonstrate skills of using ICT in their day to day activities in school. They should be prepared to learn how to use ICT, but as learners, their understanding and competence in ICT need not be so complicated. Basic skills in using ICT are desirable (Laaria 2013). Administrators should understand the elements and characteristics of long range planning for the use of current and emerging technology; demonstrate an ability analyze and react to technology issues,

concepts and proposals; posses a vision of technology in education and schools; use technology to communicate efficiently with staff, parents and the community; use technology directly to collect and analyze data and information that can improve decision making and other management functions; understand how current and available technologies can be integrated effectively into all aspects of the teaching and learning process; understand the legal and ethical issues related to technology licensing and usage; and use technology appropriately in leading and communicating about school programs and activities (Fullan 2003).

School leaders are essential to ensure availability of ICT infrastructures. By providing adequate and up to-date ICT infrastructure, there is likelihood of staff professional development where staff learns as they use them in the process of teaching in school. This creates a good working school environment where staff and students feel valued and cared for (Hennessy, 2010). According to Grono (2010) the method of providing ICT infrastructure before the staff undergoes training, is becoming a popular approach in implementation of ICT in schools. More schools are increasing ICT infrastructure without sending their staff for in-service courses, such as supplying computers to classroom so teachers are encouraged to use them. Through regular and consistent use of ICT, school leaders who are not competent in its use could develop the required skills.

As quality of school leadership improves, so does likelihood of schools implementing quality ICT. Effective school leadership focuses on ICT infrastructure, ICT implementation, ICT leadership, learning theory, general teaching and general school leadership (Laaria 2013). A study conducted by Keiyoro at el (2011) calls for institutions to increase the number of ICT resources in their schools, rather than wait for ICT facilities from external sources in the form of donations. According to Makewa et al (2013), teachers view administrators as supervisors of personnel in their organization, as well as custodians of financial matters. In this study the administrators agreed that ICT is used in areas such as computerizing financial systems, fee payment and analysis, income projections and school financial monitoring, and planning for prudent decision making in administration. According to Hennessey (2010) ICT is used by administrators to make lessons more interesting, more enjoyable for teachers and their students, more diverse, more motivating, and supportive of productive learning.

With the advent of ICTs the definition of Teaching- Learning is changed. ICT has the potential to enhance information distribution, learning, teaching and managing of educational services and make them affordable and available anytime, anywhere. So educational institutions should profoundly revise present teaching practices and resources to create more effective learning environments and improve lifelong learning skills and habits in their students. ICTs are resourceful and powerful tools that can help in this purpose and should therefore be present in every educational place (Aktaruzzaman et al, 2011).

2.4 School Leadership Technical Support in ICT Integration

Technical support is a necessary factor for implementing new innovations (Fullan, 1999). Unreliable ICT infrastructure in schools has been found to be the best innovation killer (Hepp et al, 2004). There is often a significant, positive correlation between the technical assistance received by schools and the progress of integrating ICT into teaching and learning (Byrom, 2001). Teachers are quickly frustrated in technology usage when they lack technical skill (Robinson 2003).

The providers should therefore consider giving more technical supports to institutions because this will enhance usage of ICT in teaching and learning (Keiyoro et al 2012). People who act as intermediaries between the demand and supply of information tend to lack the technical means to collect, process, store, transform and disseminate information in appropriate languages and channels for different end users. The unavailability of training materials, especially the challenge of finding appropriate training formats and content for the variety of needs of these remote schools and groups of educational staff are also considered as major issues that obstruct the implementation of ICT in rural areas (Laronde 2012).

Technical problems that impede the smooth delivery of lessons or the natural flow of the classroom activity were found to be a major barrier in teaching. These technical barriers are mostly trivial including waiting for websites to open, failing to connect to the Internet, printers not printing and generally malfunctioning computers, and they often arise because teachers have to work with old equipment (Laronde 2012). Technical support is a critical component of technology integration. If educators are required to

develop and use computer technology in daily classroom activities, it is imperative that adequate technical support is in place. The area of technical support is defined by the number of technicians to computers ratio (Weatherbee, 2008). In remote schools teachers should, at least, know how to use a computer and the Internet, understand how a computer works, and have some grasp of how to find information on the Internet (Harrison 2010).

Baseline survey report for ICT in secondary schools in selected parts of Kenyans by Oloo (2009) found out that Majority of schools (25.9%) use outsourced maintenance services while 3.7% use Computers for Schools Kenya (CFSK) supports. Departmental support that is trained teachers is also very important and 18.5% reported using internal capacity for support. Funds for support are obtained from Ministry of Education (MoE) and School funds. A study conducted in Nigerian secondary school on teachers' uses of ICTs and its implications for further development of ICT use in schools through a census of 700 teachers, showed that lack of technical support in the schools and teachers' lack of expertise in using ICT were the prominent factors hindering teachers' readiness and confidence of using ICT during lessons (Tella et al 2007). Teachers are not always fully aware that pedagogic uses of the computer require the development, among teachers as well as students, of new skills and attitudes for the effective use (Harrison 2010).

Maintenance of ICT tools is also important. Equipment maintenance ensures a safe working environment, reduction of production costs and improved product quality, reactive maintenance and safety incidents (onduru 2012). Guadette (2002) described Maintenance and repair as fixing any sort of mechanical or electrical device should it become out of order or broken. It also includes performing routine actions which keep the device in working order or prevent trouble from arising. Retaining or restoring an item in or to a state in which it can perform its required function. The actions include the combination of all technical and corresponding administrative, managerial, and supervision actions. British Standard Glossary of terms (3811:1993) defined maintenance as: the combination of all technical and administrative actions, including supervision actions, intended to retain an item in, or restore it to, a state in which it can perform a required function. Activities of maintenance function could be either repair or

replacement activities, which are necessary for an item to reach its acceptable productivity condition (onduru 2012).

Many organizations today are overcoming their state of complacency and are responding to meet increased challenges in being effective and efficient. James Youmans (2011), categorized maintenance into two types: Preventive maintenance, where equipment is maintained before break down occurs and Reactive or Corrective maintenance, where equipment is maintained after break down. Laskiewicz did a study for over five-year period for group of companies in Canada and found that productivity improvements correlated strongly with a number of variables, one of which was preventive/predictive maintenance. Mike Laskiewicz recommended that organizations recognize maintenance as a key department that needs to be well managed. In addition, the maintenance department should be led by a strong-minded individual who is a good motivator, technically competent, experienced and familiar with advanced industry practices and complexities of equipment in use (Onduru 2012).

Teacher's belief systems about technology significantly influence actual classroom practice using technology. Along with these factors, ongoing support is critical. Teachers may be willing to take a chance and try new things with technology integration if they know they will have help and support when they need it (Cuban, 2001).

2.5 School Leadership ICT Infrastructure Support

A common mistake in estimating the cost of a particular ICT educational application is to focus too much on initial fixed costs, purchase of equipment, construction or retrofitting of physical facilities, initial materials production etc.

According to weatherbee (2008) for public schools to excel academically, proper and adequate infrastructure must be present in school. Many studies have shown that many schools face the problem of ICT infrastructure, Butcher and Associate (2011) in their research show that the ratio between students and computers is wanting for example in Chile schools with fewer than 100 students receive 3 computers and 1 printer, schools with 100 to 300 students receive 6 computers with two printers. Kidombo, Gakuu and Ndiritu (2012) in their research show that schools lack enough computers for example,

Musa Gitau with 405 students has 20 computers with no connectivity, and Githunguri with 800 students has 14 computers without connectivity.

Although computers are seen as essential in the world today, the significance of computers in schools needs to be examined particularly for schools which lack infrastructure (Aumnat 2011). Many administrators have a challenge of developing ICT in schools due to inadequate funds. Most schools do not allocate adequate funds for staff development. While the private sector, in general, claims to spend about thirty percent of its technology budgets on training, other schools typically spend ten percent or less (Mann & Shafer, 1997, July mentioned by Aumnat 2011). Some research claims that organizations should spend only thirty percent of their technology budget on equipment and the remaining seventy percent should be spent on the "human infrastructure" to support ongoing training and technical assistance (White *et al.*, 2002 reported by Aumnat 2011).

The availability of a dedicated computer room could determine that computers are used for teaching and learning rather than just for administrative purposes. The move to equip schools with ICT and Internet connectivity is usually initiated by government. In some cases, the private sector, in collaboration with the government and educational institutions and members of the school community, also contributes to the implementation of computers in schools, (Aumnat2011).

Davies (2013) notes that schools all over the world continue to spend large sums of money annually on technology, with the aim of integrating ICT into the curriculum. The study concurs with that of (Condie and Monro, 2007: mentioned by Davies 2013) that there is an increase of computers and ICT in most schools allowing them to achieve baseline targets for computer to student ratio. Research done by Muthomi, Mbugua and Githua (2013) find out that majority of school principals had a positive attitude towards the integration of the use of computers in teaching and learning despite majority of them were not trained in the use of computers. The research therefore recommended that principals should provide continuous funding for purchasing and maintenance of computers.

Schools which have a significant number of functioning computers may enhance their utilization in teaching and learning science subjects, since the computer sharing ratio will be enhanced. Furthermore, network connection and availability of file servers positively influences the use of ICT in teaching and learning. Consequently, for purposes of efficiency and effectiveness in using ICT in teaching science curriculum in schools, computers need to be made available for both teachers and students at the most preferable ratio of 1:1. This is assumed to increase learner's concentration and capacity to absorb all learning materials (Keiyoro at el 2012).

Most schools acquire computers either through donation or school fund. Most donations are from government funds or from Non-Governmental Organizations (NGO). It is impressive that Computers for Schools Kenya (CFSK) has made its own distinction by contributing computers to 17.96% schools surveyed. School funds are normally internally generated incomes by the school or levies introduced by schools' management for buying computers. Parent Teachers Associations also contribute a significantly to 16.07% schools (Oloo 2009).

Availability of computers in a school is not enough without power connections (Keiyoro et al 2010). This study showed that 10.7% of the sampled secondary schools had no electricity but relied on diesel driven generators for power supply, while in 89.3% of the secondary schools which had power supply, it was restricted to areas such as the principal's offices, office reception and staff rooms but not in any of the classrooms. The study also found that 39.8% of the schools had unreliable electricity, in the sense that they frequently experienced power failures for two or more days in a row. Most schools could not afford generators let alone fuel necessary to drive the generators. Only one schools had a back-up functioning generator. These findings mean that even if all other ICT infrastructures were in place without electricity, learning using ICT would still not take place. The science teachers would therefore be likely to revert back to the conventional mode of teaching "chalk and talk" method (Keiyoro et al 2012).

The availability of a dedicated computer room could determine that computers are used for teaching and learning rather than just for administrative purposes. In the Second Information Technology in Education Study (SITES), conducted in 1997-1999 and

involving 26 countries, it was found that an insufficient number of computers in schools were the main obstacle behind realizing a school's computer-related goals (Laronde 2012). Internet availability and reliability is a key to adoption of open and distance learning (Gikonyo et al 2013).

According to Naseem (2011) access to the internet is rare and expensive in Africa due to dependence on expensive satellite connections. Eastern Africa has no submarine connectivity at present, while some West and Southern African countries benefit from the SAT-2 and SAT-3 cables. Two-way satellite connectivity is now widely available, but the costs of using this for educational purposes remain prohibitively high to be a sustainable choice for classroom use or for teacher education in the short- to medium-term (Unwin, 2005). Many rural schools located outside the national telecommunications network have to use expensive satellite technologies. However, a number of new large-scale submarine cable projects are underway which are expected to establish better links between other parts of the continent and European and Asian networks, and improve data communication for research and education (Naseem, 2011).

While fixed broadband infrastructure constitutes the bulk of high-speed connectivity for many countries, the ICT service with the steepest growth rate continues to be mobile broadband. In 2012, growth in mobile broadband services continued at 40% globally and 78% in developing countries (ITU, 2012). Worldwide, there are now twice as many mobile broadband subscriptions as fixed broadband subscriptions. Whereas people in developed countries usually use mobile broadband networks in addition to a fixed broadband connection, in developing countries mobile broadband is often the only access method available (ITU, 2013).

A report prepared for the African Development Bank, the World Bank and the African Union recommends, as a strategic objective for ICT in education in African countries, affordable, broadband connectivity enables all education institutions to connect as many ICT devices as they require to the internet, ensuring that any online activities that is; managerial, administrative or educational being undertaken by the educational institution can be done reliably and quickly (Adam et al., 2011).

Internet access in Kenya date back to the early 1990s, it was by 1998 when the Kenya Posts and Telecommunications Corporation decided to launch an Internet access backbone, increasing the rate at which Internet Service Providers (ISPs) entered the Kenyan market. When the market was liberalized in 1999, however, all the informal ISPs were granted a license, and Telkom Kenya, the newly privatized fixed-phone operator, applied for one as well. Today, there are more than 50 ISPs in Kenya (Apoyo 2011)**.** The greatest challenge in Kenya continues to be the Internet and especially broadband. The number of internet subscriptions reached 4.7 million at the end of the second quarter of 2011. The mobile data or internet subscriptions through GPRS or EDGE and 3G dominate internet subscriptions and account for 99% of the total subscriptions which is a result of the positive outcome on mobile penetration (Naseem 2011).

Keiyoro et al (2012) in their research found that most schools that had access to internet it was by fixed line infrastructure (wires). None of the institutions had the broadband wireless connection. It was found that 29.4% used dial-up connection using fixed telephone lines, 23.5% had Integrated Services Digital Network (ISDN) while 47.1% used ADSL lease line to connect to the internet. Secondary schools are not given adequate funds to provide furniture, laboratories and adequate classrooms, let alone being given adequate funds ICT infrastructures. Due to the lack of adequate power supply especially in rural areas, secondary schools located in these areas had no access to the internet and hence, could be perpetually excluded from the world's information superhighway (Paltridge, 1996 cited by Keiyoro 2012). Oloo (2009) in his study he states that majority of schools (58.9%) surveyed do not have Internet connected to the computers. The 42.9% schools who reported having internet have Internet connected from 1 Pc to over 50 PCs. Only one school with over 50 computers has internet connection to all computers. This is a national school with excellent facilities.

The Internet is a wealth of learning materials in almost every subject and a variety of media can now be accessed from anywhere at any time of the day and by an unlimited number of people. Teachers can research any topic on the web to gather information for a lesson. The Internet provides students with access to investigate worldwide problems and issues. Computers and the Internet provide a student with an unlimited resource that is available at all times for curricula and classroom activities (Capper, 2003).

2.6 School Leadership Technical Skills Development Support

Qualified teachers are often seen as a catalyst in the introduction and effective use of technology in schools. Unfortunately, in many African countries, the lack of trained teachers and the low levels of teachers' ICT knowledge and skills have been identified as major impediments to effectively introducing technology into schools (Harrison 2010). The research further states that real challenge for educationists is, therefore, how to harness the potential of ICT to complement the role of a teacher in the teaching and learning process. Teachers who do not have a chance to develop professionally in the use of emerging technologies and acquire modern computer literacy and skills are under threat.

UNESCO (2008) describes three approaches: technological literacy; knowledge deepening; knowledge creation. These approaches are seen as part of a development continuum and each approach has different implications for education reform and improvement; each has different implications for changes in the components of the education system: pedagogy, teacher practice and professional development, curriculum and assessment, and school organization and administration. ICT plays a different, but complementary role in each of these approaches, with new technologies requiring new teacher roles, new pedagogies, and new approaches to teacher education. The successful integration of ICT into the classroom depends on the ability of teachers to structure their learning environments in some non-traditional ways, merging technology with new pedagogies, to develop active classrooms that encourage cooperative interaction, collaborative learning, and group work.

ICTs impacts positively on teaching and learning processes in secondary schools even though the impact has not been realized, this may be attributed to the fact that most school leaders, Heads of departments as well as subject teachers as end users to ICT lacked adequate training on ICT use (Gichovi, 2013). The study further indicated that development of ICT skills and knowledge among school principals is slow and this explains the low levels of ICT integration in schools. A research done Prof Atieno the head of the university's school of Business of Technical University of Kenya (TUK) reported in Nation Newspaper shows that despite a high demand for Information System

(IS), there were aren't many Kenyans specially trained for the job, this problem has been attributed to failure of local universities to train in this specialization (Daily Nation Feb, 10, 2014, p 2).

Professional development programmers though have the goal of developing teachers' technological literacy so as to integrate the use of basic ICT tools into the standard school curriculum, pedagogy, and classroom structures (Harrison 2010). Awareness raising workshops providing hands-on experience of the use of audio, video, the internet, CD ROMs, DVDs, and other new ICTs are crucial at an early stage in the development of strategies for the use of ICT in teacher training, so that administrators, heads of teacher training colleges, government officials and teachers' leaders can grasp the true significance of the transformations possible, and can thereby contribute effectively to the development of such strategies (Unwin 2005).

National ICT strategies are usually successful when the application and integration in education is well established. However, there is some research that argues about obstructive factors that can appear during the implementation process. Some papers highlight the need for schools to provide leadership when integrating technology into the organization. The school management should ensure that all the processes involving technology in schools are managed effectively especially with regard to teacher training. It is made clear that the focus in the development of any technology strategy should be to ensure that the school administration and the head teachers are at the forefront of the integration of ICT into the school curriculum. The school administrators should not simply just update their skills and knowledge but also work towards ICT transformation through educational leadership (Mentz & Mentz, 2003).

Technology leadership is becoming a more important issue in the successful implementation of ICT. Schools require considerable staff development and support and school heads particularly must possess a strategy and knowledge for leading change (Laronde 2012). In addition head teachers and teachers face the huge task of reinventing schools and classrooms in a society that has been transformed by digital technologies, and many feel overwhelmed by the mandate to integrate computer technology into every subject and grade. Increasingly, school administrators are required to assume leadership

responsibilities in areas with which they are unfamiliar, and for which they have received little training (Flanagan & Jacobsen, 2003).

Heeks (2002) maintains that staffing and the local skills base in developing countries is limited in reference to the wide range of skills needed for ICT development. These skills include systems analysis, design, and implementation as well as the set of broader skills such as planning, implementing and managing ICT initiatives.

2.8 School Leadership ICT Policy Support

Leadership is crucial in developing and managing an effective ICT strategy for their schools (Tongkaw 2011). Technology leadership is becoming a more important issue in the successful implementation of ICT. Schools require considerable staff development and support and school heads particularly must possess a strategy and knowledge for leading change (Tongkaw 2011). Hadjithoma-Garstka (2009) points out that leadership is required at each level to support and participate in any stage of the policy making process and this is essential for sustainability. The national policy could be shifted towards whole school improvement through utilization of ICT resources and long term implementation.

One of the biggest threats to ICT enabled projects is resistance to change. If, for instance, the leader lacks vision or lacks perception of the benefits, then the use of ICT can hardly take off, much less be sustained long term. Due to the innovative nature of ICT-enabled projects, leaders must have a keen understanding of the innovation process, identify the corresponding requirements for successful adoption, and harmonize plans and actions accordingly (Tongkaw 2011). Strategic policies can provide a rationale, a set of goals, and a vision for what education systems might become with the introduction of ICT and how students, teachers, parents, and the general population might benefit from its use in schools (Kozma, 2008).

Vision and strategic planning is always the cornerstone for any organizational change and without this it is likely that only a few enthusiast teachers will battle alone. The vision for the place of ICT in the school should be driven by pedagogical requirements to avoid techno centric thinking. Thus school leaders should enunciate a clear vision, grounded in pedagogical understanding, and reflected in well-constructed strategic plans

(Newhouse 2011). The provision of professional learning for teachers is an integral component of the role. The Curriculum in ICT (CICT) leader needs to consider how well developed the use of ICT is at the school, what goals have been set within the vision and strategic plan, the characteristics of the staff in order to meet the needs of teachers for ICT knowledge and skills, integration strategies, and strategies for the development of student ICT skills. In all schools in the main study the most effective strategy appeared to be one-on-one support in the classroom (Newhouse 2011).

Fullan (1999) states that school heads lead the charge in focusing on instruction, school-wide mobilization of resources and effort with respect to the long-term emphasis on instruction. If the school heads are to perform effectively their actual roles, a lot of attention has to be paid to making them more effective and this will go a long way in seeing the majority of our schools do well. Five barriers impede the acquisition and use of telecommunications and these include: lack of knowledge of possible ways to integrate advanced telecommunications into the curriculum inaccessibility of equipment, lack of or outdated equipment, lack of funds specifically allocated for telecommunications and lack of in-service training (Whelan et al 1997 cited by Tongkaw 2011).

Analysis of the available research also reveals the importance of leadership in managing ICT integration. School principals are in a position to create the conditions to develop a shared ICT policy (Tondeur et al 2008). In this study only 12 of the 53 principals reported the availability of a comprehensive ICT plan including clear goals and determining the means to realize these goals. Twenty-one principals referred to a limited ICT plan, only consisting of goals but incorporating no information about strategies to pursue these goals. Becta (2002) states that supportive, enthusiastic and visionary leadership has a positive impact on teacher's attitude and behavior in the use of ICT. Policy makers and school principals can plan and support the participation of teachers in the integration of ICT in teaching and learning through training activities (Mulkeen cited in Polizzi 2013).

Tondeur et al (2008) emphasized on the role of local policies in ICT integration from a school improvement approach. The study further stated that teacher's perception of ICT school policies can have the impact on ICT integration in the classroom. Policy makers

and school leaders can foster the increase of ICT equipment in schools (Polizzi 2011). Mulkeen (2003) found out the correlation between the amount of ICT equipment at primary schools and overall usage of ICT in subject teaching. Despite all these the study conducted by Gichovi (2013) and that of Kidombo and Gakuu (2010) indicated that leaders seemed not to have ICT plan policies in their schools.

2.9 Theoretical Framework

The study was based on the School Based Management (SBM) model. Murphy (1997) defines SBM as a primarily strategy to decentralize decision making to the individual school site, it facilitates the empowerment of parents and the professionalism of teachers and shared decision making among key stakeholders at the local level. school-based management (SBM) is one of the most salient international trends of school reform, which emphasizes decentralization down to the school level as the major means for promoting effective decision-making, improving internal processes, and utilizing resources in teaching and learning to meet diverse school needs (Cheng, 2003).

School based management has been used by states to increase school accountability; by school boards to boast students' performance; by central officers to improve administrative efficiency, by teachers union to empower teachers (Briggs and Wohlstetter, 2003). The study further states that up until the late 1980s, SBM was most often adopted and implemented as a standalone reform to remedy a variety of ills of school system. Successful SBM schools have decision-making authority in the areas of budget, curriculum and personnel and they use that authority to create meaningful change in teaching and learning. It disperses power broadly throughout the school organization by creating network of decision making. It actively divides power among individuals by establishing networks, work teams and ad hoc and permanent committees.

A situation where decision making is perceived by teachers as collegial and consultative and providing adequate opportunities for participation will more likely lead to positive student perceptions about their school and teachers as well as perceptions about relationship and their own performance than where decision making is more top- down, executive or does not foster widespread teacher involvement (Mulford 2003). This study will adopt this model because integration of ICT will depend on the decision-making

authority in allocating funds to acquire ICT tools, technical facilities and the development of ICT skills among the teaching staff.

Another theory was the social cognitive view of learning, according to this theory learning is affected by social interaction (Fiste, 2005), therefore important in the integration of ICT in schools because ICT helps students to interact with other students from other schools and teachers with other teachers from other schools. The principal too uses ICT tools to send and receive mails, short messages and make calls to school stakeholders and parents. The theory states that discussions, conversations, explanations, listening are learnt by interacting with others (Fiste, 2005). Collaborative and cooperative learning demonstrate social learning. In these educational activities, learners are in touch with the tutor and other learners as they undertake tasks and projects learning through groups' activities, where cognition is located. Nowadays, the presence of ICT in most everyday activities signifies the needs for collaboration and group involvement (Toki & Pange, 2010).

2.10 The Conceptual Framework

A conceptual framework is an analytical tool with several variations and contexts. It is used make conceptual distinctions and organized ideas (Berlin, 1953). The conceptual framework that guided this study was built from the four independent variables; technical support, availability of ICT infrastructure, development of training skills in ICTs and the support of ICT policy in ICT integration teaching and learning whereas integration of ICT in teaching and learning is the depended variable. The study also has the intervening and moderating variables. Government policies on ICT are moderating variables whereas cost of ICT tools, attitude and perception of school leaders on ICT are intervening variables. The study will determine therefore the influence of these independent variables on dependent variable.

Independent Variables

```
┌─────────────────────────┐
│ Technical support       │
│                         │
│ • Project mgt           │
│   knowledge             │
│ • Manpower              │
│   recruitment           │
│ • Procurement           │
│   support               │
│ • M&E support           │
└─────────────────────────┘

┌─────────────────────────┐
│ ICT infrastructure      │
│ Support                 │
│                         │
│ •Power supply           │
│ •Control room           │
│ •Hardware               │
│ •ISP connectivity       │
└─────────────────────────┘
```

Moderating Variables

```
┌─────────────────────────┐
│ Government               │
│ policies on ICT          │
│                          │
└─────────────────────────┘
```

Dependent Variables

```
┌─────────────────────────┐
│ ICT integration in       │
│ teaching and learning    │
│                          │
│ • School MIS             │
│ • ICT skills developed   │
│ • Learning skills        │
│ • Teaching skills        │
└─────────────────────────┘
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┌─────────────────────────┐
│ Staff skills             │
│ development              │
│                          │
│ • Training  facilities   │
│ • Scholarships           │
│ • Skills inventory       │
│ • Recognition            │
└─────────────────────────┘

┌─────────────────────────┐
│ ICT Policy Support       │
│                          │
│ Type of hard ware for    │
│ computer class           │
│                          │
│ • No of students per     │
│   computer class         │
│ • No of teachers per     │
│   computer lesson        │
│ • No of computers per    │
│   school                 │
└─────────────────────────┘
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```
┌─────────────────────────┐
│ Cost of ICT tools        │
│ Perception and           │
│ Attitudes of the school  │
│ leader                   │
└─────────────────────────┘
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Intervening Variable

Figure 1 Conceptual Framework

2.11 Summary of The Research Gap

Author	Year	Method used	Findings	Gap
Murithi et al	2013	Descriptive statistics research	availability of a School ICT policy encouraged implementation of Computer Studies Curriculum in teaching and learning	How does school leadership support for ICT policy influence its integration in teaching and learning
Gichovi	2013	Descriptive statistics	The findings indicated the existence of a large number of staff who had no prior training in ICT and could not help in the integration of ICTs.	How does school leadership support for staff skill development influence ICT integration in teaching
Kyalo & mulwa	2012	cross–sectional survey research design	The results established that institutional factors such as infrastructure (connectivity, sources of energy and e-equipment) have a significant influence on readiness to adopt e-learning.	How does school leadership support for ICT infrastructure influence ICT integration

2.12 Summary of Review of Related Literature

Much has been done on issues related to implementation of ICT in teaching and learning. More research however especially on the influence of school leadership in the integration of ICT in teaching and learning. Across Africa and most developing countries there are many challenges in bringing ICTs into the education process in general, (Hennessy et al 2010).

Fullan (1999) states that school heads lead the charge in focusing on instruction, school-wide mobilization of resources and effort with respect to the long-term emphasis on instruction. If the school heads are to perform effectively their actual roles, a lot of attention has to be paid to making them more effective and this will go a long way in seeing the majority of our schools do well. Five barriers impede the acquisition and use of telecommunications and these include: lack of knowledge of possible ways to integrate advanced telecommunications into the curriculum inaccessibility of equipment, lack of or outdated equipment, lack of funds specifically allocated for telecommunications and lack of in-service training (Whelan et al 1997 cited by Tongkaw 2011). This shows that for these challenges to be overcome school leadership must come in to budget and allocate enough resources to ensure effective integration of ICT in teaching and learning.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter dealt with the research design, target population, sample size, methods of data collection instrument validity, reliability of the instruments and methods of data analysis, ethical issues and operational definition of variables.

3.2 Research Design

The research design was descriptive survey research and involved the collection of data concerning the influence of school leadership on the implementation of ICT in teaching and learning. A descriptive research is the process of collecting data in order to answer questions on a current situation (Mugenda & Mugenda 2003). Therefore the method is relevant to the study because question that will be asked will keep focus on the purpose of the study, objectives and research questions relating to the study. It a survey because according to Mugenda and Mugenda (2003) is an attempt to collect data from members of a population in order to determine the current status of that population with respect to one or more variables.

3.3 Target Population

According to Ngechu (2004), a population is a well defined set of people, services, and elements, groups of things or households that are being investigated. Mugenda and Mugenda (1999) population are more representative because everyone has an equal chance of being included in the final sample drawn. The research was conducted on the public secondary school in Kenya, Meru County in Buuri sub-county. Buuri sub- County has a total of 29 public secondary schools. The target population was 29 principals, 29 deputy principals, 116 Head of Departments (HoD) and all the students in these schools.

Table 3.1: Target Population

Category	Target population
Principals	29
Deputy principals	29
Head of Department	145
Students	14 680
Total	**14 883**

Source: District Education Office- Meru Sub-County, (2015)

3.4 Sampling Procedure

A sample is a representative of an entire population. The study was conducted in public secondary schools in Buuri Sub-County. Stratified and simple random sampling was used. The simple random sampling was applied on 29 schools to get strata of 9 schools while stratified random sampling was used to select respondents.

According to Mugenda & Mugenda (2003) 10% to 30% of the target population can be the sample size of the study; this study utilized 30% to select the sample of the study as shown in table 3.2.

Table 3.2: Sample Size and Distribution

	Sample size	Percentage
Principles	9	30
Deputy principles	9	30
Head of Department	45	30
Students	124	10
Total	**187**	**100**

Sources: Researcher, (2015)

3.5 Methods of Data Collection

The data was collected through self administered questionnaires to the respondents, interviews and structured observation. The questionnaires comprised both structured and unstructured questions. The questionnaires were divided into two sections. The first section dealt with the general information of about the respondents, while the second section dealt with the influence of school leadership in the integration of ICT in public secondary schools in Buuri sub-county. They were hand delivered to various respondents. There were two set of questionnaires; deputy principal and head of departments and the other set was for students.

Structured observation was used to check on the physical presence of ICT tools in the selected schools, and their use. Finally a semi- structured interview with principals of various schools supplemented the questionnaires. According to Gradner (2010) an interview is a two person verbal questioning initiated by the interviewer for the specific of obtaining relevant information for research. The interview was scheduled on the date of collecting the filled questionnaires in their schools.

3.6 Instrument Validity

Mugenda and Mugenda (2003) define validity as the accuracy and meaningfulness of inferences, which are based on the research results. It is the degree to which results obtained from the analysis of the data actually represents the phenomenon under study.

To ensure content validity of the questionnaires, the research sought advice from experts and my supervisors on the relevance of questions to the topic under study.

The researcher also conducted a pilot study to help identify the weakness of the research instruments. The pilot study was done in 3 public secondary schools which were not part of the study.

3.7 Reliability of the Instruments

Reliability is the measure of the degree to which a research yields consistent results or data after repeated trials (Mugenda and Mugenda, 2003). Split-half method of reliability was used to determine reliability of the instruments. Marlow (2001) split half measures how consistently the instruments measure the construct of interest and it is assumed that

if all items are drawn from the same domain, then the two halves should correlate highly with each other. All the questions were divided into two equal halves taking the odd numbered items against the even numbered items. The two sets of questions were administered to 3 schools which do not form party of the study and calculate the total score of each divided randomly half.

3.8 Data Analysis Techniques

For accuracy, uniformity and consistency, the data collected was examined and edited. According to Kothari (2004) the data obtained from questionnaires and interviews in its original form may be difficult to interpret. Data analysis is therefore the process of bringing order and meaning to raw data. The responses was edited, tabulated, analyzed and computed to percentages. The raw data was coded and entered into the computer by use of Statistical Package for Social Sciences (SPSS, version 20).

All the study variables were analyzed by use of non-parametric spearman's correlation co-efficient inferential statistical tools as the measurement of the responses is at nominal and ordinal scale, while descriptive statistical analysis measures of central tendency and dispersion was adopted for section 'A' of the questionnaire which generate the general background information of the respondents.

3.9 Ethical Issues

Kitchin (2000), states that basic ethical issues to consider in any research include privacy, confidentiality, anonymity, sensitivity to cultural differences and gender. A research permit was obtained from Meru county director of education. Information collected was treated with a lot of confidentiality; the consent of the respondents was sought before revealing the information. Respondents were not forced to give information and they didn't write their names on the questionnaires.

3.10 Operational Definitions of Variables

Table 3.3: Definition of Variables

Objectives	Variables	Indicator	Measurement	Scale	Method of data analysis
To establish the influence of school leadership technical support in the integration of ICT in teaching and learning in secondary schools	Independent Technical support	• Project mgt knowledge • Manpower recruitment • Procurement support • M&E support	-level -Competent -Procedural -Scheduled	Nominal and Ordinal	Descriptive
To determine the influence of school leadership support for infrastructures on the integration of ICT in teaching and learning in secondary schools	Independent infrastructures support	• Power supply • Control room • Hardware •ISP connectivity • Software	-Reliable -Adequate -Provided -Quality -Up dated	Nominal and Ordinal	Descriptive
To examine the influence of school leadership support for staff skills development on the integration of ICT in teaching and learning in secondary schools	Independent staff skills development support	• Training facilities • Scholarships • Skills inventory • Recognition	-Available -Given -Kept -Adequate	Nominal and Ordinal	Descriptive
To establish the influence of school leadership support for ICT policy on the integration of ICT in teaching and learning in secondary schools	Independent ICT policy support	• Type of hard ware for computer class • No of students per computer class • No of teachers per computer lesson • No of computers per school	-Enforcement -Enforcement -Enforcement -Enforcement	Nominal and Ordinal	Descriptive
To examine the influence of school leadership support in the integration of ICT on teaching and learning in secondary schools	Dependent Integration of ICT in teaching and learning	•School MIS • ICT skills developed • Learning skills • Teaching skills	-effectiveness - Level -Attained -Attained	Nominal and Ordinal	Descriptive

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Introduction

This chapter presents the analysis of data collected from the fielded items in the study questionnaire. The findings were analyzed and presented in the form of frequency tables, numerical values and percentages. The responses are presented followed by a brief interpretation guided by the research objectives and a discussion on research findings from the analysis of the data.

4.2 Reliability Statistics and Response Rate

This section presents Reliability Statistics computed on a Cronbach's Alpha scale and also presents the response rate from the fielded data collection instruments from all the categories of respondents

4.2.1 Reliability Statistics

The research endeavored to determine the extent to which the responses collected could be relied upon; and the consistency of measure for this study was done by use of Cronbach's Alpha, a reliability coefficient that indicated how well the items in the data collection instruments were positively correlated to one another (Hatcher, 1994). The study had a 0.862 value (86%) which is considered very strong/ high on a scale of 0.00-1.00 as it tends to 1.00 on attitudinal measurement scales. This is also far above the standard acceptable rate of 0.60 (60%) cut off value for being acceptable (Sakaran, 2001).

Table 4.1: Response Rate

Responses	Frequency	Percentage
Principals	7	77
Deputy principals	7	77
Head of departments	36	75
Students	117	94
Total	**167**	
Non responses		
Principals	2	23
Deputy principals	2	23
Head of departments	9	25
Students	7	6
Total	**177**	**100**

Table 4.1 Response Rate shows that the Principals 77% Deputy Principals 77% Head of departments 75% Students 94% and total combined response rate was 89%. This was found acceptable for analysis.

4.3 Background Information

These section presents Background Information of the students respondents which includes the Cross tabulation between Gender and Age bracket, Cross tabulation between Gender and Class and Descriptive Statistics on ICT integration process of learning and teaching. This section also presents the gender of respondents, highest academic qualification, designation, how long respondents have worked in their schools, how long respondents have been on current designation, and respondent's highest level of ICT training.

Table 4.2: Gender and Age respondents

Age bracket		Below 15 yrs	16yrs-17yrs	18yrs-19yrs	Above 19 yrs	Total
Gender	Male	2	16	6	6	30
	Female	4	57	26	6	95
Total		**6**	**73**	**32**	**12**	**123**

Table 4.2 shows the Cross tabulation between Gender and Age bracket and shows that those below 15yrs were 24 % male, while 66% were female. On those in the 16yrs-17yrs age bracket, Female were 78% while male were 12%. With those between 18yrs-19yrs were 81% female and 19% male, however both female and male were 50 % each gender for those above 19yrs. The findings show that the female respondents were more in each age distribution compared with the male respondents.

Table 4.3: Gender and Class Respondents

		Class		**Total**
		Form Three	Form Two	
Gender	Male	12	18	30
	Female	46	47	93
Total		**58**	**65**	**123**

Table 4.3   shows Cross tabulation between Gender and Class and shows that   Form Three had 76% Female while male were 24%, while in Form Two had 75%, overall there was 24% male and 76% female. The findings confirm that the female respondents were more in each class representation compared with the male respondents.

Table 4.4: Students Opinion On ICT Integration Process In Learning And Teaching

	N	Mean	Std. Deviation
Do you have a computer per student during computer lessons	124	2.0000	.00000
Do you have a table per student during computer lessons	124	2.0000	.00000
Do you have teachers in every computer lessons	124	1.6694	.47235
Do you have a computer technician during computer lessons	124	1.9516	.21545
Do you have a computer lab in your school	124	1.1290	.33660
Do you have a computer internet in your school	124	1.7742	.41981
Do you use computers in learning lessons	124	1.6935	.46289
Do the teachers give you home work to do with the computers	124	1.9516	.21545
Do you reference new knowledge from computers	124	1.7258	.44792
Do feel the computer knowledge you have received to be adequate	124	1.9194	.27339
Total	**124**	**1.78145**	**0.284386**

Table 4.4 shows Descriptive Statistics on student responses to questions of their interaction with the ICT integration process in learning and teaching, and shows a Mean average of 1.78145 on a 5 point Likert scale which is 36% and a Standard Deviation 0.284386, which is below 1.00 reflecting a integration high convergence of students opinion on ICT integration process in learning and teaching. The findings indicate that though there is consensus of opinion on integration process in learning and teaching, the level is very low at 36% rating by the students who are the consumers of the ICT integration process of learning and teaching.

Table 4.5: Background Information of Non- Student Respondents

Gender	Frequency	Percent
Male	28	44
Female	35	56
Highest academic qualification		
Post Graduate	5	8
Graduate	33	52
Diploma	25	40
Indicate your designation		
Deputy Principal	10	16
Head of department	53	84
How long have you worked in this school		
Less Than 6 months	5	8
6 months to 1yr	2	3
1yr to 2 yrs	5	8
2yrs -3yrs	24	38
Over 3yrs	27	43

How long have you been in your current designation		
Less Than 6 months	4	6
6 months to 1yr	37	59
1yr to 2 yrs	7	11
2yrs -3yrs	9	14
Over 3yrs	6	10
What is your highest level of ICT training		
No training	14	22
On job training	14	22
Basic computer packages	20	32
Total	**63**	**100.0**

Table: 4.5. presents   Background Information   and shows   on Gender, 56% were Female, 44% were Male , while on , Highest academic qualification, 40% , had Diploma , 8% had , Post Graduate qualifications , on respondents   , designation, 84%, Head of department , 16%, Deputy Principal, How long worked in this school ,38%, 2yrs -3yrs, 3% 6 months to 1yr , How long been in current designation, 59% ,6 months to 1yr, 6%, Less Than 6 months, highest level of ICT training, 32%, Basic computer packages No training 22%

4.4 Technical Support

This section presents the School Leadership Technical Support, Extent Does the School leadership Provide Project Management Support, Opinion how competent is the staff recruited to assist, Extent the school management enforce procedures procurement, How frequently does school management schedule monitoring and Evaluation activities, How do you rate the school leadership technical support and Descriptive Statistics.

Table 4.6: Technical Support

Extent Does The School Management Provide Project Management Support	Frequency	Percent
Much	24	38
Not Sure	15	24
not much	24	38
Opinion how competent is the staff recruited to assist		
Much	29	46
Not Sure	5	8
not much	29	46
Extent does the school management enforce procedures procurement		
Very much	5	8
Much	34	54
Not Sure	5	8
not much	19	30
How frequently does school management schedule monitoring and Evaluation activities		
Frequently	19	30
Not Sure	10	16
not Adequate	25	40
Not at all	9	14
How do you rate the school leadership technical support		
Frequently	25	40
Not Sure	5	8
not Adequate	33	52
Total	**63**	**100.0**

Table 4.6 presents the extent the school management provide project management Support 38% said, not much, 38% said, Much, 24% said, Not Sure, opinion how competent is the staff recruited to assist,46%, said not much, 46%, said Much, Not Sure, 8%, extent does the school management enforce procedures procurement, 54%, said Much, 8% said, Very much, 8%, said Not Sure, How frequently does school management schedule monitoring and Evaluation activities 40%, said not Adequate, 14%,% said Not

at all, How do you rate the school leadership technical support, 52%,said no Adequate, 8%% said, Not Sure

Table 4.7: Descriptive Statistics- Technical Support

	N	Mean	Std. Deviation
To what extent does the school management support	63	3.0000	.87988
Opinion how competent is the staff recruited to assist	63	3.0000	.96720
To what extent does the school management enforce procedures procurement	63	2.6032	1.00867
How frequently does school management schedule monitoring and evaluation activities	63	3.3810	1.06904
How do you rate the school leadership technical support	63	3.1270	.95870
Total		**3.022**	**0.976698**

Table 4.7 presents the opinion of respondents on school leadership technical support has Mean average of 3.022on a 5 point Likert scale which is 60% and a Standard Deviation 0.976698, which is below 1.00 reflecting a convergence opinion on school leadership technical support.

4.5 School Leadership Support for Infrastructures

This section presents the extent the school management ensures the school has reliable Power supply, opinions is the ICT control room or office adequate, opinion how adequate is the Hardware Provided by school management, regularly is the Software for the integration of ICT in Teaching and Learning, opinion how appropriate is the quality of Internet Service Provider (ISP) connectivity and Descriptive Statistics

Table 4.8: School Leadership Support for Infrastructure

Extent does the school management ensure the school has reliable Power supply	Frequency	Percentage
Very much	14	22
Much	24	38
not much	25	40
Your opinion is the ICT control room or office adequate		
Adequate	19	30
Not Sure	11	18
not Adequate	32	51
Not at all	1	2
Opinion how adequate is the hardware provided		
by school management		
Adequate	19	30
Not Sure	10	16
not Adequate	34	54
Disagree	5	8
Agree	39	62
Not Adequate	14	22
Not at all	5	8
Not Sure	10	16
not Adequate	34	54

Regularly is the Software for the integration of ICT in Teaching and Learning		
Very appropriate	5	8
Appropriate	5	7.9
Not Sure	15	24
Not much	33	52
Not at all	5	8
Opinion how appropriate is the quality of Internet Service Provider (ISP) connectivity		
Appropriate	10	16
Not Sure	10	16
not much	33	52
Not at all	10	16
Total	**63**	**100**

Table 4.8 presents respondents responses on the Extent to which the school management ensure the school has reliable Power supply, 40%, said Not much, 22% said, Very much, your opinion is the ICT control room or office adequate, 51%,said not Adequate, 2% said Not at all, opinion how adequate is the Hardware Provided by school management, 54%, said not Adequate, 16% said, Not Sure, regularly is the Software for the integration of ICT in Teaching and Learning, 52% said, not much, 8% said, Very appropriate, 8%, said Not at all, , opinion how appropriate is the quality of Internet Service Provider (ISP) connectivity, 52%, said not much, 16% said , Appropriate, school leadership influence availability of ICT infrastructure in teaching and learning, 62% said , Agree, 8% said, Not at all.

Table 4.9: Descriptive Statistics: School Leadership Support for Infrastructures

	N	Mean	Std. Deviation
To what extent does the school management ensure the school has reliable power supply	63	2.5714	1.22756
According to your opinion is the ICT control room or office adequate	63	3.2381	.91077
According to your opinion how adequate is the hardware provided by the school management	63	3.2381	.89288
Regularly is the software for the integration of ICT in teaching and learning	63	3.4444	1.02827
How appropriate is the quality of internet service provider connectivity	63	3.6825	.93023
School leadership influence on availability of ICT infrastructure in teaching and learning	63	3.3016	0.73254
Total	**63**	**3.24601666**	**0.9537083333**

Table 4.9 presents opinion on School Leadership infrastructure Support has a Mean average of 3.3 on a 5 point Likert scale which is 65% and a Standard Deviation 0.954, which is below 1.00 reflecting a convergence of opinion on influence School Leadership infrastructure Support.

4.6 School Leadership support for Staff Skills Development

This section presents responses as to what extent does the school leadership ensure availability of training facilities for staff , what extent does the school leadership give Scholarships to the staff training, how regularly is the staff Skills inventory on the integration of ICT in Teaching and Learning in your Schools maintained, how adequate is the recognition done of new ICT skills by school leadership in your Schools and level of ICT proficiency among teaching staff in their institution as an effort in the integration of ICT in Teaching and Learning in your Schools

Table: 4.10: School Leadership Support for Staff Skills Development

	Frequency	Percent
Extent does the school leadership ensure availability of training facilities for staff		
Very Much	10	16
Much	4	6
Not Sure	15	24
Not at all	34	54
Total	63	100
Extent does the school leadership give Scholarships to the staff training		
Very Much	5	8
Much	9	14
Not sure	15	24
Not at all	34	54
Total	63	100
How regularly is the staff Skills inventory on the integration of ICT in Teaching and Learning in your Schools maintained		
Very Regularly	10	16

Regularly	34	54
Not sure	5	8
Not at all	14	22
Total	63	100.0
Adequate Is The Recognition Done Of New ICT Skills By School Leadership In Your Schools		
Very Adequate	20	32
Adequate	19	30
Not sure	19	30
Not adequate at all	5	8
Total	63	100
level of ICT proficiency among teaching staff in their institution		
Very high level	10	16
High level	34	54
Not sure	5	8
Low level	14	22
Total	63	100.0

Table: 4.10 presents responses on the extent does the school leadership ensure availability of training facilities for staff, 54% said Not at all, while 6% said Much. On Extent does the school leadership give Scholarships to the staff training, 54% said Not at all while 8% said Very Much. On how regularly is the staff Skills inventory on the integration of ICT in Teaching and Learning in your Schools maintained, 54% said Regularly while 8% said Not sure and on how adequate is the recognition done of new ICT skills By School Leadership In the Schools, 32% said Very Adequate while 8% said Not adequate at all. On level of ICT proficiency among teaching staff in their institution 54% said High level while 8% said not sure.

4.7 School Leadership Support for ICT Policy

This section presents School Have Any Policy In Place To Enforce The Development Of ICT Skills Among The Teachers, Enforcement Of UNESCO ICT Policy-No Of Computers Per School, Enforcement Of UNESCO ICT Policy -No Of Students Per

Computer Lesson, Enforcement of UNESCO ICT Policy-No Of Teachers Per Comp Lesson Enforcement Of UNESCO ICT Policy-Type Of Hardware For Comp Class and Descriptive Statistics

Table 4.11: School Leadership support for ICT Policy- UNESCO

	Frequency	Percent
School Have Any Policy In Place To Enforce The Development Of ICT Skills Among The Teachers		
Yes	39	62
No	24	38
Total	63	100
Enforcement Of UNESCO ICT Policy-No Of Computers Per School		
Agree	4	6
Neutral	10	16
Disagree	34	54
Strongly Disagree	15	24
Total	63	100
Enforcement Of UNESCO ICT Policy -No Of Students Per Computer Lesson		
Agree	34	54
Neutral	9	14
Disagree	15	24
Strongly Disagree	5	8
Total	63	100
Enforcement of UNESCO ICT Policy-No Of Teachers Per Comp Lesson		
Strongly agree	10	16
Agree	34	54
Neutral	5	8
Disagree	14	22
Total	63	100.0
Enforcement Of UNESCO ICT Policy-Type Of Hardware For Comp Class		
Agree	20	32
Neutral	19	30
Disagree	19	30
Strongly Disagree	5	8
Total	**63**	**100**

Table 4.11 presents responses on School Have Any Policy In Place To Enforce The Development Of ICT Skills Among the Teachers, 62%, said yes, on enforcement of UNESCO ICT Policy-No of Computers Per School, 54%, said , disagree 6% said Agree. On enforcement of UNESCO ICT Policy -No of Students Per Computer Lesson, 54% said Agree, 8% said Strongly Disagree, On Enforcement of UNESCO ICT Policy-No of Teachers Per Comp Lesson, 54% said Agree, 8% were Neutral, On enforcement of UNESCO ICT Policy-Type of Hardware For Comp Class, 32%, said they Strongly Disagree 8%.

Table 4.12: Descriptive Statistics - School Leadership Support for ICT Policy-UNESCO

	N	Mean	Std. Deviation
enforcement of UNESCO ICT policy-No of computers per school	63	3.9524	.81178
Enforcement of UNESCO ICT policy-No of Students per computer lesson	63	2.8571	1.04507
Enforcement of UNESCO ICT policy-No of teachers per comp lesson	63	2.3651	1.00485
Enforcement of UNESCO ICT policy-type of hardware for comp class	63	3.1429	.96482
Total		**3.079375**	**0.95663**

Table 4.12 presents the influence of School Leadership ICT Policy Support UNESCO, which has a Mean average of 3.079375on a 5 point Likert scale which is 62% and a Standard Deviation 0.95663, which is below 1.00 reflecting a convergence of opinion on School Leadership ICT Policy Support UNESCO

4.8 School Leadership GOK ICT Policy Support

This section presents Enforcement of GOK ICT Policy- on No of Computers per School, Enforcement of GOK ICT Policy-No of Students per Computer Lesson, Enforcement of

GOK ICT Policy-No of Teachers per Comp Lesson, Enforcement of GOK ICT Policy-Type of Hardware for Comp Class

Table 4.13: School Leadership ICT Policy Support t-GOK

	Frequency	Percent
Enforcement Of GOK ICT Policy-No Of Computers Per School		
Agree	28	44
Neutral	10	16
Disagree	20	32
Strongly Disagree	5	8
Total	63	100
Enforcement Of GOK ICT Policy-No Of Students Per Computer Lesson		
Agree	30	48
Neutral	14	22
Disagree	14	22
Strongly Disagree	5	8
Total	63	100
Enforcement Of GOK ICT Policy-No Of Teachers Per Computer Lesson		
strongly agree	10	16
Agree	29	46
Neutral	15	24
Disagree	9	14
Total	63	100
Enforcement Of GOK ICT Policy-Type Of Hardware For Comp Class		
Neutral	43	68
Disagree	15	24
Strongly Disagree	5	8
Total	**63**	**100.0**

Table 4.13 presents the responses on Enforcement of GOK ICT Policy-No of Computers per School lesson where 44% said they agreed, 48% said they Agree, 8% said they Strongly Disagree. Enforcement of GOK ICT Policy-No Of Teachers Per Comp Lesson, 46% said they Agree, 14%, said they disagree, Enforcement of GOK ICT Policy-Type Of Hardware For Comp Class, 68% they Neutral, 8% said they Strongly Disagree.

Table 4.14: Descriptive Statistics School Leadership and GOK ICT Policy

	N	Mean	Std. Deviation
Enforcement of GOK ICT policy-No of computers per school	63	3.0317	1.04678
Enforcement of GOK ICT policy-No of Students per computer lesson	63	2.9048	1.01146
Enforcement of GOK ICT policy-type of hardware for comp class	63	3.3968	.63601
Total		**3.1111**	**0.8980833**

Table 4.14 presents the influence of School Leadership GOK- ICT Policy Support which has a Mean average of 3.1111on a 5 point Likert scale which is 62% and a Standard Deviation 0.8980833, which is below 1.00 reflecting a convergence 0f Opinion on School Leadership GOK- ICT Policy Support.

4.9 School Leadership ICT POLICY Support -County Government

This section presents responses on Enforcement of County Government ICT Policy, No of Computers per School, enforcement of County Government ICT policy-No of Students per computer lesson, enforcement of County Government ICT policy-No of teachers per comp lesson, enforcement of County Government ICT policy-type of hardware for computer class and Descriptive Statistics School Leadership County Government ICT POLICY Support.

Table 4.15: School Leadership County Government ICT POLICY Support

	Frequency	Percent
Enforcement Of County Government ICT Policy-No Of Computers Per School		
Agree	5	8
Neutral	23	37
Disagree	30	48
Strongly Disagree	5	8
Total	63	100
enforcement of County Government ICT policy-No of Students per computer lesson		
Agree	38	60
Neutral	20	32
Strongly Disagree	5	8
Total	63	100
enforcement of County Government ICT policy-No of teachers per comp lesson		
strongly agree	10	16
Agree	19	30
Neutral	24	38
Disagree	10	16
Total	63	100
enforcement of County Government ICT policy-type of hardware for comp class		
Agree	13	21
Neutral	25	40
Disagree	20	32
Strongly Disagree	5	8
Total	**63**	**100**

Table: 4.15 present responses on Enforcement of County Government ICT Policy. On No Of Computers Per School, 48% said they disagree , 8% said they Strongly , Disagree, on enforcement of County Government ICT policy-No of Students per computer lesson, 60% said they Agree, 8%, Strongly Disagree, while on enforcement of County Government ICT policy-No of teachers per comp lesson, 38%, were Neutral ,16% said they strongly agree. On enforcement of County Government ICT policy-type of hardware for comp class 40%, were Neutral, 8%, said they Strongly Disagree.

Table 4.16 Descriptive Statistics- School Leadership and County Government ICT Policy Support

	N	Mean	Std. Deviation
Enforcement of County Government ICT policy- number of students per computer lesson	63	2.5556	.85719
Enforcement of County Government ICT policy – number of teachers per computer lesson	63	2.5397	.94741
Enforcement of County Government ICT policy – type of hardware for computer lesson	63	3.2698	.88366
Total		**2.788366**	**0.89608667**

Table 4.16 presents the respondents opinion on School Leadership County Government ICT Policy Support, which has a Mean average of 2.788366 on a 5 point likert scale which is 56% and a Standard Deviation 0.89608667, which is below 1.00 reflecting a convergence 0f Opinion on influence of School leadership Support on County Government ICT Policy.

4.10 School Leadership Support in the Integration of ICT in Teaching and Learning

This section presents respondents opinion on the Level of Learning skills attained, and how they rate school leadership influence ICT integration. The section also presents descriptive Statistics on School Leadership Support in the Integration of ICT in Teaching and Learning

Table 4.17: School Leadership Support in the Integration of ICT in Teaching and Learning

Your Opinion What Is The Level of Learning Skills Attained	Frequency	Percent
High	15	24
Not Sure	19	30
not Adequate	29	46
Total	63	100
How Do You Rate School Leadership Influence ICT Integration		
Strong influence	10	16
Some influence	34	54
Little influence	19	30
Total	**63**	**100.0**

Table 4.17 presents the Level of Learning skills attained, 46% said not Adequate, 24%,said High, on how they rate school leadership influence ICT integration, 54%, said Some influence, 16% said, it has a Strong influence.

Table 4.18: School Leadership Support in the Integration of ICT in Teaching and Learning

	N	Mean	Std. Deviation
opinion how effective is the School Management Information System	63	3.1587	.86521
opinion what is the Level of staff ICT skills developed	63	2.9206	1.00485
your opinion what is the Level of Learning skills attained	63	3.2222	.81209
opinion what is the Level of Teaching skills-Attained	63	3.0635	.83999
how do you rate school leadership influence ICT integration	63	2.4444	1.08921
Total	**63**	**2.96188**	**0.92227**

Table 4.18 presents the School Leadership Support in the Integration of ICT in Teaching and Learning has a Mean average of 2.96188 on a 5 point Likert scale which is 59% and a Standard Deviation 0.92227, which is below 1.00 reflecting a convergence of respondents Opinion on School Leadership Support in the Integration of ICT in Teaching and Learning.

4.11 Non-Parametric Inferential Statistics:- Spearman's' Rank Correlation Coefficient

This section presents the level of influence refers to the level of probability that the results obtained from a study are likely to have occurred by chance (Mugenda and Mugenda, 2003). To aid in confidence of results from descriptive statistics for this study; the researcher has used non-parametric inferential statistical Spearman's' Rank Correlation Coefficient which allow the examination of the degree of relationship of School Leadership Support in the Integration of ICT in Teaching and Learning

This section presents Spearman's' Rank Correlation Coefficient for integration of ICT in teaching and learning in secondary schools, influence of school leadership technical support , influence of school leadership infrastructures support , influence of school leadership staff skills development support and influence of school leadership ICT policy support

4.11.1 Influence of Technical Support, in the Integration of ICT in Teaching and Learning in Secondary Schools

The Non parametric test Statistics results on influence of school leadership technical support shows that the p value = 0.072 (p>0.05), which indicates that the p-value is above 0.05 and therefore school leadership technical support has no influence on integration of ICT in teaching and learning in secondary schools.

4.11.2 Influence of School Leadership Support for Infrastructures on the Integration of ICT in Teaching and Learning in Secondary Schools

The Non parametric test Statistics results on influence of school leadership infrastructures support shows that the p value = .002 (p<0.05), which indicates that the p-value is below 0.05 and therefore school leadership infrastructures support has an influence on integration of ICT in teaching and learning in secondary schools.

4.11.3 Influence of School Leadership Support for Staff Skills Development in the Integration of ICT in Teaching and Learning in Secondary Schools

The Non parametric test Statistics results on influence of school leadership staff skills development support shows that the p value = .040 (p<0.05), which indicates that the p-value is below 0.05 and therefore school leadership staff skills development support has an influence on integration of ICT in teaching and learning in secondary schools

4.11.4 Influence of School Leadership Support for ICT Policy on the Integration of ICT in Teaching and Learning in Secondary Schools

The Non parametric test Statistics results on influence of school leadership ICT policy support shows that the p value = .000 (p<0.05), which indicates that the p-value is below 0.05 and therefore school leadership ICT policy support has an influence on integration of ICT in teaching and learning in secondary schools

4.12 Summary of Data Analysis

The opinion of respondents on school leadership influence availability of ICT infrastructure has Mean average of 3.022 which is 60% and a convergence opinion on school leadership influencing availability of ICT infrastructure. Opinion on School Leadership Staff Skills Development Support has a Mean average of 3.3 which is 65% reflects a convergence of opinion on influence School Leadership on Staff Skills Development Support.

On the influence of School Leadership support for ICT Policy- UNESCO, which has a Mean average of 3.079375on a 5 point Likert scale which is 62% and a Standard Deviation 0.95663, which is below 1.00 reflecting a convergence of opinion on School Leadership ICT Policy Support UNESCO. On the influence of School Leadership support for GOK- ICT Policy which has a Mean average of 3.3 which is 62% reflecting a convergence of Opinion on School Leadership support for GOK- ICT Policy. On the respondent's opinion on School Leadership County Government ICT Policy Support, this has a Mean average of 2.788366 which is 56%. Reflects a convergence of opinion on influence on School Leadership support for County Government ICT Policy

The Non parametric test Statistics results on influence of technical support shows that the p value = 0.072 (p>0.05), which indicates that the p-value is above 0.05. The Non

parametric test Statistics results on influence of school leadership support for infrastructures shows that the p value = .002 (p<0.05), which indicates that the p-value is below 0.05. The Non parametric test Statistics results on influence of school leadership support for staff skills development shows that the p value = .040 (p<0.05), which indicates that the p-value is below 0.05.

The Non parametric test Statistics results on influence of school leadership support for ICT policy shows that the p value = .000 (p<0.05), which indicates that the p-value is below 0.05. On School Leadership Support in the Integration of ICT in Teaching and Learning has a Mean average of 2.96188 on a 5 point Likert scale which is 59% and a Standard Deviation   0.92227, which is below 1.00 reflecting a convergence of respondents Opinion on School Leadership Support in the Integration of ICT in Teaching and Learning.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study findings together with conclusions of the study. The chapter further covers recommendations of the study as well as suggestions for further studies.

5.2 Summary of Findings

The purpose of this study was to examine the influence of leadership in the integration of ICT in teaching and learning in public secondary schools in Meru County, Buuri sub-county.

i. The study presents Background information. The findings show that the female respondents were more in each age distribution compared with the male respondent and the findings confirm that the female respondents were more in each class representation compared with the male respondents. For non-student respondents the study shows that on Gender, Majority (56%) were Female, While on, highest academic qualification, Majority (40%,), on respondents , designation, Majority (84%), Head of department, How long worked in this school, Majority (38%), 2yrs -3yrs, How long been in current designation, Majority (59%) ,6 months to 1yr, highest level of ICT training, Majority (32%), Basic computer packages.

ii. The study presents the extent the school leadership provide project management Support Majority (38%) said, not much, opinion how competent is the staff recruited to assist, Majority (46%), said not much, extent does the school leadership enforce procedures procurement, Majority (54%), said Much, How frequently does school management schedule monitoring and Evaluation activities (40%), said not Adequate. On how the respondents rate the school leadership technical support, Majority (52%), said no Adequate, on the Extent to which the school leadership ensure the school has reliable Power supply, Majority (40%),

said not much, Opinion is the ICT control room or office adequate, Majority (51%), said not Adequate.

iii. Opinion how adequate is the Hardware provided by school leadership, Majority (54%), said not Adequate, regularly is the Software for the integration of ICT in Teaching and Learning, Majority (52%) said, not much, Opinion how appropriate is the quality of Internet Service Provider (ISP) connectivity, Majority (52%), said not much, school leadership influence availability of ICT infrastructure in teaching and learning, Majority (62%) said Agree, The study presents responses on School have any policy in place to enforce The Development Of ICT Skills Among the Teachers, Majority (62%), said yes.

iv. On enforcement of UNESCO ICT Policy-No of Computers per School, Majority (54%), said. On enforcement of UNESCO ICT Policy -No of Students per Computer Lesson, Majority (54%) said Agree, On Enforcement of UNESCO ICT Policy-No of Teachers per Comp Lesson, Majority (54%) said Agree. Type of Hardware for Comp Class, Majority (32%), said they Strongly Disagree. The study presents the responses on Enforcement of GOK ICT Policy-No of Computers per School lesson where Majority (44%) said they agreed. Enforcement of GOK ICT Policy-No of Teachers per Comp Lesson, Majority (46%) said they Agree. Type of Hardware for Comp Class, Majority (68%) was Neutral on opinion. On No of Computers per School, Majority (48%) said them disagree. on enforcement of County Government ICT policy-No of Students per computer lesson, Majority (60%) said they Agree. While on enforcement of County Government ICT policy-No of teachers per comp lesson, Majority (38%), were Neutral. On enforcement of County Government ICT policy-type of hardware for comp class Majority (40%) had a Neutral opinion.

v. The study found school leadership support for staff skills development has an influence on integration of ICT in teaching and learning in secondary schools, school leadership support for ICT policy has an influence on integration of ICT in teaching and learning in secondary schools, technical support has no influence on integration of ICT in teaching and learning in secondary schools and school

leadership support for infrastructures has an influence on integration of ICT in teaching and learning in secondary schools.

5.3 Discussions

This section discusses the four objectives and their influence on the integration of ICT based on the research findings.

5.3.1 Influence of Technical Support, in the Integration of ICT

in Teaching and Learning in Secondary Schools

The study has established that school leadership technical support with the p= value 0.072 (p>0.05) has no influence on integration of ICT in teaching and learning in secondary schools. These findings are contradicted with findings by Grono (2010) who found that the method of providing ICT infrastructure before staff undergoes training is becoming a popular approach in implementation of ICT in schools. However study conducted by Keiyoro at el (2011) calls for institutions to increase the number of ICT resources in their schools, rather than wait for ICT facilities from external sources in the form of donations which could explain the disconnect by the respondents in this study. . This study is also agreed with by Makewa et al (2013), teachers view administrators as supervision of personnel in their organization, as well as custodians of financial matters but fail to related this with leadership technical support in the integration of ICT in teaching and learning in secondary schools

5.3.2 Influence of School Leadership Support for

Infrastructures on the Integration of ICT in Teaching

and Learning in Secondary Schools

The study has established that school leadership support for infrastructures with the p value .002 (p<0.05) has an influence on integration of ICT in teaching and learning in secondary schools. These findings are supported by Butcher and Associate (2011) in their research show that the ratio between students and computers is wanting as many schools face the problem of ICT infrastructure. The study concurs with that of (Condie and Monro, 2007: mentioned by Davies 2013) that there is an increase of computers and ICT

in most schools allowing them to achieve baseline targets for computer to student ratio. Research done by Muthomi, Mbugua and Githua (2013) also found that majority of school principals had a positive attitude towards the integration of the use of computers in teaching and learning despite majority of them were not trained in the use of computers. The findings are also supported by Keiyoro et al (2012) who found that most schools that had access to internet it was by fixed line infrastructure (wires). None of the institutions had the broadband wireless connection, a similar conclusion by Oloo (2009) in his study he states that majority of schools surveyed do not have Internet connected to the computers.

5.3.3 Influence of School Leadership Support for Staff Skills Development on the Integration of ICT In Teaching and Learning in Secondary Schools.

The study has established that school leadership support for staff skills development with the p value .040 (p<0.05) has an influence on integration of ICT in teaching and learning in secondary schools. The study findings are supported by Harrison (2010) who found professional development programmers though have the goal of developing teachers' technological literacy so as to integrate the use of basic ICT tools into the standard school curriculum, pedagogy, and classroom structures. The study findings are also supported by Heeks (2002) whose study maintains that staffing and the local skills base in developing countries is limited in reference to the wide range of skills needed for ICT development.

5.3.4 Influence of School Leadership Support for ICT Policy on the Integration of ICT in Teaching and Learning in Secondary Schools

The study has established that school leadership support for ICT policy with the p value .000 (p <0.05) has an influence on integration of ICT in teaching and learning in secondary schools. The findings are similar to those by Hadjithoma-Garstka (2009) who points out that leadership is required at each level to support and participate in any stage of the policy making process and this is essential for sustainability. These is supported by Newhouse (2011), who founds that school leaders should enunciate a clear vision,

grounded in pedagogical understanding, and reflected in well-constructed strategic plans. The same is supported by Tondeur et al (2008) whose study recommendations emphasized on the role of local policies in ICT integration from a school improvement approach. Tondeur et al (2008) Analysis of the available research also reveals the importance of leadership in managing ICT integration. School principals are in a position to create the conditions to develop a shared ICT policy.

5.4 Conclusion of the Study

i.   The study has established that technical support has no influence on integration of ICT in teaching and learning in secondary schools.

ii. The opinion of respondents on school leadership influence availability of ICT infrastructure was unanimously agreed upon by the respondents to have an influence in the integration of ICT in teaching and learning in secondary schools.

iii. School Leadership support for Staff Skills Development was unanimously agreed upon by the respondents to have an influence in the integration of ICT in teaching and learning in secondary schools.

iv. Though most respondents had just minimum knowledge and skills on the influence of School Leadership support for ICT Policy UNESCO, was unanimously agreed upon by the respondents to have an influence in the integration of ICT in teaching and learning in secondary schools. On the influence of School Leadership support for GOK- ICT Policy On the influence of School Leadership support for ICT Policy county ICT policy, was unanimously agreed upon by the respondents to have an influence in the integration of ICT in teaching and learning in secondary schools.

The findings indicate that though there is consensus of opinion on integration process in learning and teaching among the student, the level is very low as rated by the students who are the consumers of the ICT integration process of learning and teaching.

5.5 Recommendation of the Study

The study has established that technical support has no influence on integration of ICT in teaching and learning in secondary schools, it is therefore important to establish what technical support is a priority in the integration of teaching and learning in secondary schools. The study has established that school leadership support for infrastructures has an influence on integration of ICT in teaching and learning in secondary schools. The study recommends that the schools should increase their compliance with the various policies so as to ensure more effective integration of teaching and learning in secondary schools.

The study has established that school leadership support for staff skills development has an influence on integration of ICT in teaching and learning in secondary schools. It is therefore important to improve on the level of staff skills development as most respondents had just minimum knowledge and skills. The study has established that school leadership ICT policy support has an influence on integration of ICT in teaching and learning in secondary schools. However, it is recommended that more awareness should be made by the bodies that are charged with policy so as to increase the involvement as most had little to offer on the influence of policies in the integration of teaching and learning in secondary schools.

5.6 Room for Further Study

Study sought to determine the factors that influence the integration of ICT in teaching and learning in secondary schools. This has been achieved though there is room for further investigation as to why;

i.   School leadership technical support has no influence on integration of ICT in teaching and learning in secondary schools.

ii.   Most respondents were not aware of the level of influence of the Policies on integration of ICT in teaching and learning in secondary schools.

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APPENDICES

Appendix I: Transmittal Letter

    a) Questionnaire for the students

Magare Tabitha K

P.O BOX 114O,

MERU

Dear Respondents

RE: PROJECT RESEARCH.

I am Tabitha Magare. A master's student at the University of Nairobi, carrying out a research on the topic "influence of leadership in the integration of ICT in teaching and learning in public secondary schools in Kenya a case of buuri sub-county in Meru County. I kindly request you to help me in this research by answering the questionnaires sent below. I promise you absolute confidentiality on whatever information you may provide. The information that you shall provide will be used for this research. Thanks in advance for your cooperation.

Yours faithfully

Magare Tabitha

Tick where appropriate

Gender	Form 3	Form 2	Form 1
Male			
Female			
Total			

Do you have a computer per student during computer lessons   yes/ no

Do you have a table per student during computer lessons   yes/ no

Do you have teachers in every computer lessons   yes / no

Do you have a computer technician during lessons   yes/ no

Do you computer internet in your school   yes/ no

Do you use computer in learning lessons   yes / no

Do your teachers give you homework to do with computers   yes/ no

Do you refer new knowledge from computers   yes / no

Do you feel the computer knowledge you have received to be adequate   yes /no

Appendix II: Questionnaire for the Deputy Principal and HODs

Magare Tabitha K

P.O BOX 114O,

MERU

Dear Respondents

RE: PROJECT RESEARCH.

I am Tabitha Magare. A master's student at the University of Nairobi, carrying out a research on the topic "influence of leadership in the integration of ICT in teaching and learning in public secondary schools in Kenya a case of buuri sub-county in Meru County. I kindly request you to help me in this research by answering the questionnaires sent below. I promise you absolute confidentiality on whatever information you may provide. The information that you shall provide will be used for this research. Thanks in advance for your cooperation.

Yours faithfully

Magare Tabitha

Appendix III: Questionnaires Deputy Principles and HODs.

The researcher is conducting survey on the Influence of School Leadership in the Integration of ICT in Teaching and Learning in Public Secondary Schools in Buuri Sub-County**.**

Instructions: Kindly provide your honest opinion on all the items in the questionnaires. By placing a Tick [√] where appropriate

PART I: BACKGROUND INFORMATION

1. Gender

   Male ☐   Female ☐

2. Highest academic qualification

   Post Graduate. ☐   Graduate ☐ Diploma ☐

3. Indicate your designation

   Deputy Principal ☐   Head of department   ☐

4. How long have you worked in this school?

   Less Than 6 months ☐

   6 months to 1yr ☐

   1yr to 2 yrs ☐

   2yrs -3yrs ☐

   Over 3yrs ☐

5. How long have you been in your current designation?

   Less Than 6 months ☐

   6 months to 1yr ☐

   1yr to 2 yrs ☐

   2yrs -3yrs ☐

   Over 3yrs ☐

6. What is your   highest level of ICT training?

   ☐ No training

   ☐ On job training

   ☐ Basic computer packages

   ☐ Certificate in ICT

☐ Diploma in ICT

☐ Degree in ICT

7. In your opinion does enforcement of GOK ICT policy influence ICT in teaching and learning in your Schools?

……………………………………………………………………………………

SECTION B: Technical Support

8. To what extent does the school leadership provide Project management support in the integration of ICT in Teaching and Learning in your Schools?

Very much ☐

Much ☐

Not Sure ☐

not much ☐

Not at all ☐

9. In your opinion how competent is the staff recruited to assist in the integration of ICT in Teaching and Learning in your Schools?

Very much ☐

Much ☐

Not Sure ☐

not much ☐

Not at all ☐

10. To what extent does the school leadership enforce procedures procurement of equipment for integration of ICT in Teaching and Learning in your Schools?

Very much ☐

Much ☐

Not Sure ☐

not much ☐

Not at all ☐

11. How frequently does school leadership schedule monitoring and Evaluation activities in the integration of ICT in Teaching and Learning in your Schools?

Very frequently ☐

Frequently ☐

Not Sure ☐

not much ☐

Not at all ☐

12. How do you rate the school leadership technical support in the integration of ICT in Teaching and Learning in your Schools?

Very adequate ☐

Adquate ☐

Not Sure ☐

not Adquate ☐

Not at all ☐

SECTION C. School Leadership support for Infrastructures

13. To what extent does the school leadership ensure the school has reliable Power supply for the integration of ICT in Teaching and Learning in your Schools

Very much ☐

Much ☐

Not Sure ☐

not much ☐

Not at all ☐

14. In your opinion is the ICT control room or office adequate for the integration of ICT in Teaching and Learning in your Schools

Very adequate ☐

Adquate ☐

Not Sure ☐

not Adquate ☐

Not at all ☐

15. In your opinion how adequate is the Hardware Provided by school leadership for the integration of ICT in Teaching and Learning in your Schools

        Very adequate ☐

        Adquate ☐

        Not Sure ☐

        not Adquate ☐

        Not at all ☐

16. How regularly is the Software for the integration of ICT in Teaching and Learning in your Schools Up dated?

        Very appropriate ☐

        Appropriate ☐

        Not Sure ☐

        not Adquate ☐

        Not at all ☐

17. In your opinion how appropriate is the quality of Internet Service Provider (ISP) connectivity for the integration of ICT in Teaching and Learning in your Schools?

        Very appropriate ☐

        Appropriate ☐

        Not Sure ☐

        not Adquate ☐

        Not at all ☐

18. Generally does school leadership influence availability of ICT infrastructure in teaching and learning?

        Strong disagree ☐

        Disagree ☐

        Agree ☐

        Agree to some extent ☐

        Strong agree ☐

19. In your opinion does School Leadership Infrastructures Support influence ICT in teaching and learning in your Schools?

……………………………………………………………………………………

SECTION D: School Leadership support for Staff Skills Development

20. To what extent does the school leadership ensure availability of training facilities for staff as an effort in the integration of ICT in Teaching and Learning in your Schools?

Very much ☐

Much ☐

Not Sure ☐

not much ☐

Not at all ☐

21. To what extent does the school leadership give Scholarships to the staff training as an effort in the integration of ICT in Teaching and Learning in your Schools?

Very much ☐

Much ☐

Not Sure ☐

not much ☐

Not at all ☐

22. How regularly is the staff Skills inventory on the integration of ICT in Teaching and Learning in your Schools maintained?

Very regularly ☐

Regularly ☐

Not Sure ☐

not regular ☐

Not at all ☐

23. In your opinion how adequate is the recognition done of new ICT skills by school leadership in your Schools?

        Very adequate   ☐

        Adquate   ☐

        Not Sure   ☐

        not Adquate   ☐

        Not at all   ☐

24. What is the level of ICT proficiency among teaching staff in your institution?

        Very high ☐

        High ☐

        Not sure ☐

        Low ☐

        Very low ☐

SECTION E: School Leadership support for ICT Policy

25. Does your school have any policy in place to enforce the development of ICT skills among the teachers?

    ☐ Yes   No   ☐

26. Kindly rate on a scale of 1-5 the extent to which each of the following is influence of school leadership enforcement of UNESCO ICT policy on integration of ICT in teaching and learning in your Schools using the key **SA**–Strongly Agree; **A**-Agree; **N**-Neutral; **D**-Disagree; **SD**-Strongly Disagree

Measure	SA (5)	A (4)	N(3)	D(2)	SD(1)
a. No of computers per school					
b. No of students per computer class					
c. No of teachers per computer lesson					
d. Type of hard ware for computer class					

27. In your opinion does enforcement of School Leadership ICT Policy Support influence ICT in teaching and learning in your Schools?

…………………………………………………………………………………………

28. Kindly rate on a scale of 1-5 the extent to which each of the following is influence of school leadership enforcement of GOK ICT policy on integration of ICT in teaching and learning in your Schools?. using the key **SA**–Strongly Agree; **A**-Agree; **N**-Neutral; **D**-Disagree; **SD**-Strongly Disagree

Measure	SA (5)	A (4)	N(3)	D(2)	SD(1)
a. No of computers per school					
b. No of students per computer class					
c. No of teachers per computer lesson					
d. Type of hard ware for computer class					

29. Kindly rate on a scale of 1-5 the extent to which each of the following is influence of school leadership enforcement of County Government ICT policy on integration of ICT in teaching and learning in your Schools?. using the key **SA**–Strongly Agree; **A**-Agree; **N**-Neutral; **D**-Disagree; **SD**-Strongly Disagree

Measure	SA (5)	A (4)	N(3)	D(2)	SD(1)
a. No of computers per school					
b. No of students per computer class					
c. No of teachers per computer lesson					
d. Type of hard ware for computer class					

30. In your opinion does enforcement of GOK ICT policy influence ICT in teaching and learning in your Schools?
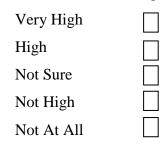
……………………………………………………………………………………………

SECTION F: School Leadership Support in the Integration of ICT in Teaching and Learning

31. In your opinion how effective is the School leadership Information System as a result of the integration of ICT in teaching and learning in your School?

    Very effective ☐
    effective ☐
    Not Sure ☐
    not as effective ☐
    Not at all effective ☐

32. In your opinion what is the Level of staff ICT skills developed as a result of the integration of ICT in teaching and learning in your School?

    Very High ☐
    High ☐
    Not Sure ☐
    Not High ☐
    Not At All ☐

33. In your opinion what is the Level of Learning skills attained as a result of the integration of ICT in teaching and learning in your School?

    Very High ☐
    High ☐
    Not Sure ☐
    Not High ☐
    Not At All ☐

34. In your opinion what is the Level of Teaching skills-Attained as a result of the integration of ICT in teaching and learning in your School?

Very High ☐

High ☐

Not Sure ☐

Not High ☐

Not At All ☐

35. Generally how do you rate school leadership influence ICT integration in teaching and learning in your School?

Strong influence ☐

Some influence ☐

Not Sure ☐

Little influence ☐

No influence ☐

36. In your opinion does School Leadership Support in the Integration of ICT in Teaching and Learning influence teaching and learning in your Schools?

…………………………………………………………………………………………

Appendix IV: Interview Guide For School Principals

The researcher is conducting survey on the Influence of School Leadership in the Integration of ICT in Teaching and Learning in Public Secondary Schools in Buuri Sub-County**.**

<u>Part One</u>

1. Gender

    Male ☐   Female ☐

2. Highest academic qualification

    Post Graduate. ☐   Graduate ☐   Diploma ☐

3. How long have you worked in this school?

    Less Than 6 months   ☐

    6 months to 1yr   ☐

    1yr to 2 yrs   ☐

    2yrs -3yrs   ☐

    Over 3yrs   ☐

4. How long have you been in your current designation?

    Less Than 6 months   ☐

    6 months to 1yr   ☐

    1yr to 2 yrs   ☐

    2yrs -3yrs   ☐

    Over 3yrs   ☐

5. What is your   highest level of ICT training?

    ☐ No training

    ☐ On job training

    ☐ Basic computer packages

    ☐ Certificate in ICT

    ☐ Diploma in ICT

6. To what extent do the following influence enforcement of UNESCO ICT policy on integration of ICT in teaching and learning in your Schools?.

Measure	SA (5)	A (4)	N(3)	D(2)	SD(1)
e. No of computers per school					
f. No of students per computer class					
g. No of teachers per computer lesson					
h. Type of hard ware for computer class					

7. To what extent do the following influence GOK   ICT policy on integration of ICT in teaching and learning in your Schools?

Measure	SA (5)	A (4)	N(3)	D(2)	SD(1)
e. No of computers per school					
f. No of students per computer class					
g. No of teachers per computer lesson					
h. Type of hard ware for computer class					

8. To what extent do the following influence enforcement of County Government   ICT policy on integration of ICT in teaching and learning in your Schools?

Measure	SA (5)	A (4)	N(3)	D(2)	SD(1)
e. No of computers per school					
f. No of students per computer class					
g. No of teachers per computer lesson					
h. Type of hard ware for computer class					

9. In your opinion does enforcement of UNESCO ICT policy influence teaching and learning in your Schools?

   ……………………………………………………………………………………

10. In your opinion does enforcement of GOK ICT policy influence ICT in teaching and learning in your Schools?

   ……………………………………………………………………………………