

**ASSESSMENT OF EDUCATION MANAGEMENT INFORMATION SYSTEM IN  
KENYA: A CASE STUDY OF LIMURU SUB-COUNTY, KIAMBU COUNTY**

**BY  
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Q51/75333/2014**

**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF  
ARTS IN MONITORING AND EVALUATION OF POPULATION AND  
DEVELOPMENT PROGRAMMES, POPULATION STUDIES AND RESEARCH  
INSTITUTE, UNIVERSITY OF NAIROBI.**

**NOVEMBER 2016**

**DECLARATION**

This project is my original work and to the best of my knowledge has not been presented for a degree award in this or any other university.

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This research project has been submitted for award of Master of Arts degree in Monitoring and Evaluation of Population and Development Program with our approval as the University supervisors.

Signature.....Date.....

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Signature.....Date.....

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## **DEDICATION**

This project is dedicated to my lovely wife Mercy Muhia whose support was immense during my studies and our first born daughter Gloria Wambui who though young gave me smiles every day that kept me going. May you grow to fulfill God's purpose in your life.

This work is also dedicated to my parents Mr. and Mrs. Robert Waweru who used every coin they had to see me go to school and finally to my sisters Mary, Lucy, Jedidah, Jane, Agnes, Ann and only brother Joseph. Thank you all for your love.

## **ACKNOWLEDGEMENT**

First and foremost, I thank God who gave me the opportunity, strength, grace and capacity to do this work. Secondly, my gratitude goes to my supervisors Dr. Wanjiru Gichuhi and Dr. Andrew Mutuku who gave me guidance, support, encouragement and inspiration during the research work. My appreciation also goes to the lecturers at the Population Studies and Research Institute (PSRI) who include Prof. Murungaru Kimani, Prof Alfred Agwanda, Prof. Ikamari, Dr. George Odipo, Dr. Anne Khasakhala, Dr. Samwel Wakibi, Dr. Boniface K'Oyugi, and Mr. Ben Jarabi. Thank you all for your support during my coursework. Appreciation also goes to the non-teaching staff at the PSRI and my fellow classmates whom we burnt the midnight oil together.

My special thanks go to the staff at Limuru Sub-County office for they furnished me with the data that was required on time. Their assistance was helpful particularly when I was collecting data. Lastly and most importantly, my appreciation goes to my family. Thank you for the support during my two years of study.

God bless you all.

## **ABSTRACT**

An Education Management Information Systems (EMIS) aims to improve the capacity for data processing, storage, analysis and providing education planners with timely data. An EMIS also helps to streamline the flow of information, eliminate duplication of information for decision making, provide information for policy dialogue and facilitate the use of relevant information in decision making by planners at all levels. The general objective of the study was to assess whether EMIS is functional and effective in Limuru Sub-County, Kiambu County. The specific objectives of the study were to assess the adequacy of technological infrastructure that supports Education Management Information Systems; to determine adequacy of skills among education administrators; and to establish the extent to which Education Management Information Systems' processes were followed. The study utilized primary data. The main method of data analysis was descriptive statistics.

The findings of the study revealed that EMIS in Limuru Sub-County was functional but not effective. The study assessed the adequacy of technological infrastructure by determining the access to functional computers, ICT gadgets and internet connection by the Sub-County education office staff, principals and head of departments and established that it was inadequate. The study established that Sub-County education office staff had computer literacy skills that were sufficient in questionnaire design; data capture; database management and data cleaning; database packages; data analysis; data presentation and reporting; graphical data presentation; and data interpretation and statistical report writing most of the time hence adequate. On the other, principals and HoDs' computer literacy skills that were found to be inadequate. Further, the study established that EMIS processes were followed to a large extent by the schools and the Sub-County education office.

The study recommended that the Sub-County education office and schools should be equipped with technological infrastructure to improve the data collection, analysis, storage and dissemination processes. The study also recommended that school principals and the Heads of departments should be trained on regular basis so as to boost their computer literacy skills.

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# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background of the Study**

Wendy (2002) defines an Information System (IS) as a set of interrelated components working together to gather, process, store, retrieve and disseminate information that supports decision making by management. A Management Information System (MIS) can either be computer based or manual (Mugo, 2014). Information systems (IS) help to enhance productivity and improve business processes in organizations (Kelegai and Middleton, 2004).

An Education Management Information System (EMIS) is a system used to provide timely, cost effective and user-appropriate information for the management of education development at all levels (Wako, 2003). EMIS is also defined as “a system of people, technology, models, methods, processes, procedures, rules and regulations that function together to provide education leaders, decision makers and managers at all levels with a comprehensive, integrated set of relevant, reliable, unambiguous, and timely data and information to support them in completion of their responsibilities” (Kornkaew, 2012). According to Abdul-Hamid (2014), “EMIS is a necessary element of an education system that enables policy makers to make critical modifications to the system in order to improve the quality of education”.

A functional and effective EMIS responds to the demand for the right data and data-driven decisions which is constantly growing globally (Abdul-Hamid, 2014; World Bank, 2013d). Governments and international community are monitoring progress in their efforts to achieve the Education For All (EFA) goals and the Sustainable Development goals (SDGs) (Abdul-Hamid, 2014; Luena, 2012 and Maoulidi, 2008).

Data- driven decisions are important in efforts to improve the efficiency in an education system (Abdul-Hamid, 2014) while accurate and reliable information is necessary to inform policy and programs in education (World Bank, 2011; Hua and Herstein, 2003). World Bank (2015) noted that EMIS provides quality and timely data, drives efficiency

and supports evidence- based decision making (World Bank, 2015). Without data there is wastage of education budget both in the developing and developed countries (Abdul-Hamid, 2014). For example in the state of Arizona (USA), it was estimated that ‘ghost students’ cost the state about \$125 million every year (Butcher, 2012).

The objectives of an EMIS are: to improve the capacity for data processing, storage, analysis and providing education planners with timely data; to facilitate the use of relevant information in decision making by planners at all levels; to eliminate duplication of information for decision making; to streamline the flow of information; and to provide information for policy dialogue (Mohamed et al., 2009). Therefore, the main reason for using EMIS is to increase managerial effectiveness by processing and transforming data into information that is useful to support decision making in education (Pegler, 1992).

An effective EMIS causes schools to excel in examinations and co-curricular activities (Hansen, 2006). According to UNESCO (2010), school data can also be used in financial planning, improving exam performance, instilling discipline, nurturing the students talents, comparison to other schools, reporting to authorities, minimizing the wastage of students as well as making the school projections.

Every country in the world has some kind of functioning “EMIS” regardless of the quality of data which is collected by the system (Mohamed et al., 2009). Although there may be difference in the collection and processing of data due to availability of technologies, there is universality in the functioning of EMIS across contexts because data is the core of its operations (Abdul-Hamid, 2014). EMIS in some countries collect, processes and disseminates data manually while it is computer-based in some countries (Mugo, 2014). Despite the fact that the use of computers in school administration has received little attention compared to their use in teaching and learning (Olson, 1988), they help in running administrative functions of the schools.

Since independence, the Government of Kenya attaches great importance to the education sector in its development agenda. The sector gets the highest allocation amounting to about 28% of state budget annually (UNESCO, 2008c; Bunyi, 2006). Similarly, EMIS is

mandatory requirement for all public schools since it is a government policy (Walekhwa et al, 2016; Republic of Kenya, 2005). The EMIS survey is sent from the Ministry of Education (MoE) headquarters through various levels to all public secondary schools. The principals are responsible for filling in the survey before sending it back to the MoE headquarters through the same channel (Glennerster et al., 2011). The head of departments also help the principals in carrying out the administrative duties in schools (Walekhwa et al, 2016).

Upon admission of students to secondary schools, comprehensive data such as age, sex, health status, family economic status, residence, gifts and talents, previous performance and career prospects is collected. However, there has been concern to whether the data is used for decision making process (Ndiku et al., 2014). During the students' lifetime in schools, the data that should be kept include the students' enrolment, students' performance per grade per year, career prospects, repetitions, transfers, dropouts, discipline records, students meetings and subject combinations (Mugo, 2014; UNESCO, 2010). Over the years, the Government of Kenya through the Ministry of Education (MOE) has invested heavily in material and human resources for the purpose of strengthening EMIS so as to capture this data (Republic of Kenya, 2009).

A successful EMIS cannot exist in a vacuum (Abdul-Hamid, 2014). The development of a functional and effective EMIS requires three basic components namely: people, process, and technology (Bernbaum and Moses, 2011). Kurt (2001) supports the three components by defining EMIS as a system that brings together people, process and technology. On the other hand, Cassidy (2006) noted that in order to develop a computer-based EMIS, there was need to identify and manage organizational, human resource and technical issues which correlates to organization, people and technology (Cassidy, 2006).

## **1.2 Problem Statement**

A functional EMIS provides quality and timely data, drives efficiency, supports evidence-based decision making, streamlines flow of information and eliminates duplication of effort. In addition, it also improves capacity for data collection, storage and analysis (World Bank, 2015; Mohamed et al., 2009 and Pegler, 1992).

Despite the crucial role played by EMIS, the status of EMIS in many countries remains as they were a decade ago hence raising concern (Bernbaum and Kurt, 2011). Countries all over the world are in need of an effective EMIS (World Bank, 2014). However, in developing a functional and effective EMIS, countries face challenges such as lack of internet connectivity, lack of human resources, limited technical capacity, financial resource constraints, disparity in allocation of funds, negative attitude towards EMIS, lack of coordination, lack of commitment by those in power, lack of clear policies, high turnover of qualified staff and lack of a standard system for data collection ( Ariko, 2014; Kornkaew, 2012; Mohamed et al, 2009; Shah, 2008; Trucano, 2006; and Hua and Herstein, 2003).

In Kenya, the Ministry of Education (MOE) has made huge investment in terms material and human resources to develop and institutionalize EMIS. However, despite the investment Kenya still lacks an effective EMIS (Republic of Kenya, 2009a). Available evidence on assessment of EMIS reveals that EMIS personnel at the national, regional, Sub-County, divisional, zonal and school levels possess inadequate skills in data collection, data analysis, data interpretation, data management and cleaning, graphical data presentation and system management. Further, available evidence show that technological investment for EMIS is inadequate and EMIS processes do not flow clearly (Walekhwa et al., 2016; Kendall, 2012 and MOE, 2008).

At national level the assessment of EMIS has not been done for nearly 10years. The education system in Kenya faces numerous challenges such as low enrolments of students in high schools which can be alleviated using a functional and effective EMIS. In 2014 for instance, the Gross Enrolment Rate (GER) and Net Enrolment Rate (NER) were 58.2 percent and 47.4 percent, respectively. Cases of regional disparities have also been reported in different Counties (MOE 2014). Further, there is no known empirical evidence at the Sub-County level (MOE, 2008).

The current study focused on EMIS in Limuru Sub-County since there was no known empirical evidence on the status of EMIS in this Sub-County. Further, information from EMIS can be used by decision makers to increase the EMIS data return rates which was

low, reduce school dropout rates and cases of students' unrest in schools which has been on the rise in the recent past. Further, information generated by this study will help to strengthen EMIS which is a tool required to respond to the increased demand for quality data which was accelerated by the introduction of Free Primary Education (FPE) and Free Day Secondary Education (FDSE) programmes in 2003 and 2008 respectively (MOE, 2012).

The study sought to assess the status of EMIS by addressing the research question; is the Education Management Information System in Limuru Sub-County functional and effective?

### **1.3 Objectives of the Study**

The general objective of the study was to assess the status of Education Management Information System (EMIS) in Limuru Sub-County, Kiambu County, Kenya.

The specific objectives of the study were:

1. To assess the adequacy of technological infrastructure that supports Education Management Information Systems in Limuru Sub-County.
2. To determine adequacy of computer literacy skills among education administrators in Limuru Sub-County.
3. To establish the extent to which Education Management Information Systems' processes are followed in Limuru Sub-County.

### **1.4 Justification of the Study**

The study assessed the status of Education Management Information System in Limuru Sub-County, Kiambu County, Kenya. Limuru Sub-County was selected because even after the introduction of free primary education, the enrolment remains low (Karanja, 2014). The rate of teacher turnover has been alarming and affecting education in public secondary schools negatively (Waititu, 2013). Further, some schools in Limuru Sub-County fall in the regions that are categorized as hardship areas and require a lot of attention (Ngigi, 2014). The Sub-County further faces challenges of such as students' unrests, drug abuse, high school dropouts, gender parity and dismal performance in

national examinations which can be alleviated using EMIS (MOE, 2014). Moreover, accurate data from EMIS is useful in allocation of scarce resources designated for Free Day Secondary Education (MOE, 2008).

In addition, the findings of the study will provide the policy makers with the status of EMIS in Limuru sub-county which may lead to its upgrade. EMIS is an inevitable tool which helps in monitoring the Education For All (EFA) goals, Sustainable Development Goals (Trucano, 2006). In addition to building the body of knowledge in EMIS, the findings of the study can be helpful to other Sub-counties in their budgetary processes.

### **1.5 Scope and Limitation of the Study**

The study assessed the status of EMIS in Limuru Sub-County. The Sub-County covers an approximate area of 281.8 square kilometers and has 24 public secondary schools. First, the study was limited to public secondary schools that had been in existence for at least one year. Schools that were in existence for less than an year were exempted from the study for they lacked the required data. Public secondary schools were selected because they draw funds for students' fees, physical infrastructure development, text books and human resources (teachers) from the government. Secondly, the study was limited to the components of a functional and effective EMIS which are technology, people and processes.

In the component of technology, connectivity to electricity was not assessed because the Government of Kenya had connected all the public secondary schools in this Sub-County to mains electricity. Further, the presence of telephone lines was not assessed because the emergence of mobile communication devices had made communication easier with administrators using either the school or personal mobile phones for communication within and outside the schools.

Although the EMIS processes were data collection, data processing, data analysis, reporting, publication, dissemination and feedback (Wako, 2003; Carrizo et al., 2003), the study only focused on data collection, data analysis and reporting due to financial



constraints. Given that school administrators were expected to spearhead the process of integrating technology in management, teaching and learning processes, the actual use of available technology and perceived ease-of-use of EMIS were not assessed.

The study was not able to provide scores in relation to accessibility to functional computers for administrative use, accessibility to ICT gadgets, accessibility to internet connection, adequacy of skills, presence of data on students and other school resources, mode of data analysis, mode of data storage and presence of a master database. This was because there were no standard scores that were available for this type of assessment. The study used likert scale for the assessment.

The respondents of this study rated themselves and therefore it was hard to ascertain whether the ratings given reflected their abilities. Similarly, other aspects of monitoring and evaluation such as the extent to which EMIS data is used in decision making and the impact of the system to the broad range of stakeholders were not assessed.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter focuses on related literature of the study. Part 1 presents the theoretical review of the study followed by the components of Education Management Information System (EMIS), description of EMIS in Kenya, empirical literature review on assessment of EMIS, conceptual framework and the last part presents the operational framework of the study.

#### **2.2 Theoretical Review**

The study was informed by the general systems theory (von Bertalanffy, 1968). Systems theory was developed in the 1950s and 1960s and attempted to explain and predict the behavior of the entire organization which includes people, structure, environment and technology. Concepts of the general systems theory underlie the development of information systems (O'Brien, 1991). Khazanchi and Munkvold (2000) defined a system as “a collection of interrelated components that work together for a common purpose” which concurs with the systems theory.

An information system is therefore seen as a collection of interrelated components (hardware, software, procedures, people and databases) which work together. Further, Laudon and Laudon (1998) emphasized that information systems consists of three basic activities namely: inputs, processes and outputs. The three are the prerequisites for transforming raw data into useful information.

#### **2.3 Components of Education Management Information System**

In the recent years, there has been high investment to the development of EMIS throughout the world (Shoobridge, 2015). The investment has been necessitated by the increased demand for data that has caused many countries to reform their education systems by collecting more data and using performance indicators (Bruns, Filmer, and Patrinos, 2011). For example in Britain, the central government availed \$325 million to promote use of computers in administration and management following the Education reform Act in 1988 (Visscher et al., 2003).

A functional and effective EMIS needs to have an improved school record keeping practice with easy to use procedures, needs to meet decision-making timelines, ensure appropriate capacity building takes place, and has improved and comprehensive data collection timeliness (Lao EMIS strategic plan, 2008-2010). On the other hand, a functional and effective EMIS require technology, people and processes so as to achieve its role (Bernbaum, and Moses, 2011). The three components are interrelated.

An EMIS requires technological infrastructure which include computers, internet, and telephone lines among other Information Communication and Technology (ICT) gadgets so as to perform its role effectively. In the developed countries such as United Kingdom (UK), Netherlands and Malaysia, studies have indicated that school administrators require computer facilities in carrying their administrative roles (Visscher, et al., 2003). Computers are a basic requirement for EMIS (Mugo, 2014; Gupta et al., 2010).

A computer consists of both hardware and software which are used to process information. The software includes word-processing programs such as MS word; spreadsheets such as Ms Excel; data management programs such as Ms Access; and presentation packages such as Ms PowerPoint. EMIS Computer software helps the users in their communications with a broad range of stakeholders from the ministry headquarters to the Sub-Counties and schools (Bakibinga, 2011). Computers replace the manual filing of records which is tedious and time consuming (Aduwa-Ogiegbaen and Iyamu, 2005). Studies have shown that it is a demanding task to develop and maintain EMIS software (Robin, 2004).

In Nigeria, lack of adequate electricity was a hindrance to the operations of EMIS (Trucano, 2006). A telephone lines/mobile phones and faxes are used to communicate in and outside the school. Despite the critical role played by technology in EMIS, technology alone cannot be able to compensate for lack of adequate skills and knowledge, inadequate organizational processes or inadequate infrastructure (Kornkaew, 2012). People's skills and organizational processes are equally important in the development of EMIS.

People encompass staff who are administrators at various levels and who should be computer literate (Kinuthia, 2009). They include the Sub-County Education Officer (SCEO), Sub-County Quality Assurance and Standards Officers (SCQASOs), principals and heads of departments (HoDs). People's knowledge and computer literacy skills are required in the process of building, maintaining and using EMIS (Kornkaew, 2012). Lack of human resource capacity limits the development of EMIS to a large extent for skilled and knowledgeable human resource directly affects the success of EMIS development. Staff require skills in word-processing; spreadsheets, data management programs; presentation and statistical packages (Bennet, 1996).

According to Carrizo et al. (2003), it is difficult to have qualified personnel for work that requires EMIS and therefore training of personnel is required during the development of EMIS. For example administrators at the schools level should be trained on updating and maintenance of school files and records (Carrizo et al., 2003). Given that principals and the head of departments are directly involved in administrative duties in their respective offices (Walekhwa et al., 2016), they should be equipped with knowledge, computer literacy skills and attributes to enable them to perform their roles effectively and efficiently (Bernbaum and Moses, 2011; Bush and Jackson, 2002). Computer literacy skills of principals and teachers have been found to enhance the collection, processing and use of student's data (Walekhwa et al., 2016).

An effective EMIS has a fully functioning information cycle and for effective data sharing and coordination to occur, it should be cyclical (Abdul-Hamid, 2014). According to Wako (2003), EMIS has seven components which must all be functioning and should be followed in order to achieve the desired result. The components are data collection, data processing, data analysis, reporting, publication, dissemination and feedback (Makwati et al., 2004; Wako, 2003; Carrizo et al., 2003). Data can both be analyzed and stored manually (using physical files) or using a computer (Mugo, 2014). It is the responsibility of EMIS administrator to ensure that records in the schools are properly maintained (Wako, 2003). The mode of data storage used either enhances or deter the processing, storage, retrieval and dissemination processes (Walekhwa et al., 2016).

Given that students are the main business in a school, each school is required to have a database where data is stored after collection and analysis. The presence of data on the students enhances the equality, equity and management of the school. Further, the data should be available for up to four years and easily accessible for it is useful in tracking progress and taking remedial measures (Walekhwa et al., 2016). In Malaysia, EMIS helps education policy makers and managers to make good and timely decisions on staff emoluments, teacher deployment and school development (Mohamed et al., 2009; Kingdom of Cambodia, 2008).

According to the foregoing literature, EMIS can only be functional and effective if it has the right technological infrastructure; the right people with the required knowledge and skills; and the laid down processes and procedures are followed. Out of the three, there is no component which can compensate for the lack of the other two and therefore the three are dependent on each other. There is a strong interrelationship between technology, people and processes.

#### **2.4 Description of Education Management Information System in Kenya**

Education in Kenya has been highly centralized. The Ministry of Education (MOE) headquarters is the central level (highest level) where educational policies and strategies are made. Before the promulgation of the new constitution in 2010 (MOE, 2012), the next level was province. Information was flowing from the central level to this level before moving down to the district level, zonal level and the institutional level which were the schools (Swarts and Wachira, 2009).

In 2005, the Government of Kenya together with other development partners developed the Kenya Education Sector Support program (KESSP) which had 23 Investment Programs (IPs) all aimed at delivering quality education and training to all Kenyans (Republic of Kenya, 2009). EMIS was one of the IPs in the KESSP whose objective was to help the government to achieve education targets that were outlined in sessional paper No. 1 of 2005 and included attainment of Universal Primary Education (UPE) and Education for All (EFA) among others (Republic of Kenya, 2005).

It is the known benefits of EMIS in education that compelled the Government of Kenya (GoK) through the Ministry of Education Science and Technology (MoEST) to enact a policy requiring all schools to collect, process, store and disseminate accurate and timely data three times in a year (Republic of Kenya, 2005). An effective EMIS aims at establishing infrastructure and systems that support data collection, processing and dissemination for purpose of planning and management (Mugo, 2014). Further, an effective EMIS helps to improve the job performance of the users by producing the information needed to make important decisions quickly (Bakibinga, 2011).

Upon admission of students to secondary schools, comprehensive data such as age, sex, health status, family economic status, residence, gifts and talents, previous performance and career prospects is collected. However, there has been concern to whether the data is used for decision making process (Ndiku et al., 2014). During the students' lifetime in schools, the data that should be kept include the students' enrolment, students' performance per grade per year, career prospects, repetitions, transfers, dropouts, discipline records, students meetings and subject combinations (Mugo, 2014; UNESCO, 2010).

The MOE headquarters currently has an EMIS unit which distributes EMIS questionnaires to the County offices which are headed by the County Education Officers (CEOs) and has an EMIS unit. The County office distributes the same questionnaires to the Sub-County education offices in their jurisdiction. The Sub-County is headed by the Sub-County Education Officer (SCEO) and has an EMIS unit. The Sub-County education office distributes the questionnaires to the schools which are headed by principals. The school principals fill the questionnaires before returning them to the Sub-County education office. The office validates the data, checks their completeness and stores a back up before sending the data to the EMIS centre where it is consolidated into a national database, analyzed and later compiled into reports (Ariko et al., 2014).

The Teacher Service Commission (TSC), Kenya National Examination Council (KNEC) and the Ministry of Education (MOE) collect the EMIS information independently. However, efforts are underway to reduce the duplication of efforts by these bodies. Although the EMIS functions have been carried out manually, there had been a demand to use current technology to ensure accurate and reliable information is disseminated in a timely manner. For example from the year 2010, KNEC (the body that administers examinations in Kenya) abolished the manual registration of candidates. The registration of candidates exercise is currently carried out using an internet platform where students are registered on the KNEC's website (Makewa et al, 2013, Otieno, 2010).

Kenya is currently in the National Education Sector Plan (NESP) (2013 – 2018) which was published to provide the framework necessary for implementation of Sessional Paper No. 14 of 2012. One of its policy goals is to develop and institutionalize an effective EMIS and Integrated Financial Management Information System (IFMIS) across the education sector. The objectives of the integrated EMIS initiative includes establishing County Education Data banks in the 47 counties, developing a sector wide EMIS Coordination Policy, building capacity within relevant bodies, deploying EMIS and school mapping; and institutionalizing an integrated IFMIS for the education sector to capture on-budget and off-budget spending on education (Republic of Kenya, 2015).

NESP (2013-2018) outlines challenges facing EMIS in Kenya as lack of coordination between various levels, lack of qualified EMIS personnel in all the 288 Sub-Counties, weak record management, poor ICT connectivity between the Sub-Counties and the department of education, financial constraints, disorganization, lack of harmonization, unreliable data making EMIS ineffective and absence of necessary legal framework to govern the EMIS activities (Republic of Kenya, 2015; Ariko et al., 2014).

## **2.5 Empirical Literature Review on Assessment of Education Management Information System**

The empirical literature review of this study will focus on technology, people and processes. A functional and effective EMIS requires the right technology, right people and the right processes. Each of the components of EMIS is discussed below.

### **2.5.1 Technology**

Technological infrastructure consists of computer and other ICT gadgets, internet, telephone lines/mobile phones, electricity and other peripheral devices. Computer and other ICT gadgets play a crucial role in enhancing the processes of data collection, analysis, storage and dissemination. In addition, they are key requirement in the process of integration technology to EMIS (Walekhwa et al., 2016).

A study was carried out in Rarieda Sub-County and established that public secondary schools did not have enough computers. Majority of the respondents rated the presence of computers and other ICT gadgets at between 26 and 50 percent. Half of the principals rated the presence of computers at 26-50 percent, 21.4 percent gave a rating of 51-100 percent while 28.6 percent rated the presence of computers at 0-25 percent. Similarly, 64.3 percent of HODs rated the presence of computers in schools between 26-50 percent showing that they were inadequate. Upon interview, the Sub-County Education Officer (SCEO) and Sub-County Quality Assurance and Standards Officers (SCQASOs) gave the same rating as the HoDs (26-50 percent). The study concluded that it was difficult to implement EMIS in schools for such gadgets are key requirements in the process of data collection, analysis and dissemination. Due the inadequacy, the study established that some teachers had resulted to use of personal laptops in data collection and analysis (Walekhwa et al., 2016).

In a study to assess the presence of computers in schools, the Kenya Education Management Capacity Assessment (2008) found that most principals did not have computers and therefore did not carry out data analysis in relation to school attendance and examinations. Only 16 percent and 25 percent of principals carried out analysis of examination related data and school attendance, respectively. School attendance and examination analysis helps to track trends in learning and performance. Further, only a small fraction of principals used the data for decision making, planning, budgeting and dissemination (MOE, 2008).



Internet (both intranet and extranet) uses coaxial cables and fiber optic cables and is required by all management information systems to enhance information sharing (Gupta et al., 2010; Bennet, 1996). In places where broadband internet infrastructure is not available, modems are used as the source of internet. In a base line survey report, Oloo (2009) found that only 42.9 percent of schools had internet. Further, about 50 percent of schools had email addresses which meant that some schools sourced for internet services outside the schools. On the other hand, the report indicated that computer ownership was a big challenge for most schools (Oloo, 2009).

A study conducted by Kiptalam and Rodrigues (2010) found that 82 percent of rural and urban schools which were connected to electricity had access to internet for more than 40 hours in a month. On the other hand, 18 percent of schools had access to the internet for less than 20 hours in a month. About 92 percent of teachers had email address leading to the conclusion that although the access to internet was still limited, the use of internet was becoming popular to schools.

### **2.5.2 People**

The component of people consists of education administrators who include the Sub-County Education Officer (SCEO), Sub-County Quality Assurance and Standards Officers (SCQASOs), principals and heads of departments at the Sub-County level. Knowledge and computer literacy skills are required in the process of building, maintaining and using EMIS (Kornkaew, 2012). At the school level, the human resource needs to be skilled in order to implement EMIS effectively. The computer literacy among the principals and teachers can enhance or deter the process of data collection, processing and use (Walekhwa et al., 2016).

Walekhwa et al (2016) carried out a study to determine the computer literacy skills among the school administrators in Rarienda Sub County. The study found that majority of principals lacked the computer skills that are required for their administrative roles. Their skills were rated to be below average. The outcome for the Sub-County Education Officer (SCEO), Sub- County Quality Assurance Standards Officers (SCQASO) and Head of Departments (HoDs) skills implied the same outcome.

In 2012, United States Agency for International Development (USAID) in conjunction with Research Triangle Institute (RTI) carried out the Iraq Education Management Capacity Assessment (IEMCA) with the aim of assessing the staff capabilities. The findings of the study revealed that EMIS staff lacked skills in procedures and schedules for data collection, data analysis, data interpretation, database management and data cleaning, graphical data presentation and systems management. Further, the findings revealed that most teachers had not attended any in-service training course for a long period of time (Kendall, 2012).

### **2.5.3 Processes**

EMIS processes include data collection, data processing, data analysis, reporting, publication, dissemination and feedback (Wako, 2003; Carrizo et al, 2003). Since the main focus of a school is students, every school should have data on students to enhance equality and equity (Walekhwa et al., 2016). The school should collect data on student's enrolments, classroom profile, students with special needs and other resources such as textbooks and physical facilities (Maoulidi, 2008).

Walekhwa et al. (2016) conducted a study among public secondary schools in Rarieda Sub- County to assess the availability of data on students and other resources. The study established that 64.3 percent of the principals had the data on students and resources to an extent of 76-100 percent. Similarly, the same rating was reported by 75 percent of the heads of departments. Further, responses from the interview schedules with the Sub-County Education Officer (SCEO) and the Sub-County Quality Assurance and Standards officers (SCQASO) agreed with the rating from the principals and the head of departments. The findings revealed that schools administrators performed their roles of collecting and storing relevant students' data to a large extent (Walekhwa et al., 2016).

The findings of the study concurred with a similar study in which 98 percent of the head teachers reported that EMIS-related documents such as admission registers were used by schools. Despite acknowledging the use, the respondents were facing difficulties in maintaining proper records that provide primary data for effective EMIS. The study

found that about 40 percent of the school heads were unable to produce school admission registers which are used in school management. Further, 64 percent and 41 percent could not produce fees registers and staff returns respectively. Schools reported that they faced problems when filling the data returns for MOE and other bodies such as TSC and KNEC (MOE, 2008).

After the collection of data, it needs to be analyzed so as to be meaningful and helpful in decision making process. In a study to determine the modes used to ensure data is collected, analyzed and disseminated in a timely manner, Walekhwa et al (2016) observed that most data was collected, analyzed and disseminated manually and not by using a computer system. 75 percent and 82.1 percent of principals and heads of departments respectively reported that data was collected and disseminated manually. Similarly, majority of the respondents had reported absence of computers and ICT gadgets in their school for data management. At the SCEO office the study established that a computer system was used to process and disseminate the data to a large extent (51-75 percent). The finding of this study attributed the delays in delivery of data return forms to the manual mode of data collection and dissemination (Walekhwa et al., 2016).

Relevant data should be stored securely and should be retrievable whenever required for decision making by the stakeholders. Some schools store the data manually (in spring files) while others store the data in computers making it easy to retrieve. Walekhwa et al (2016) conducted a study in which 96.4 percent and 80.4 percent of principals and HoDs respectively reported that data was stored manually in physical files. Similarly, only 3.6 percent of the principals and 19.6 percent of the heads of departments reported to store data in computers (Walekhwa et al., 2016).

After the collection, data is analyzed and stored in master database which is a central point where all the data is stored and made available at any time. In a study to establish the presence of a master database in public secondary schools, Walekhwa et al. (2016) found that most schools did not have such a database. More than 90 percent of the respondents reported that they lacked a master database in their schools. In the study,

78.6 percent of principals and 90.2 percent of the HoDs reported that their schools lacked a master database (Walekhwa et al., 2016).

## **2.6 Summary of Literature Review**

From the literature review, it is clear that the functionality of EMIS is influenced by technology, people and processes. A functional and effective EMIS requires the right technological infrastructure (computers, ICT gadgets and internet), the right people (with computer literacy skills which are sufficient for them to carry out their roles effectively) and the right process which should be followed in a clear manner. Any inadequacy in the components compromises the establishment and development of EMIS. The three components act as the input required by the information system so as to produce quality data usable for decision making.

## **2.7 Conceptual Framework**

An EMIS is a comprehensive system that brings together technology, people and processes (Kornkaew, 2012). According to Bernbaum and Moses (2011), a functional and effective EMIS depends on three factors. EMIS can only be functional and effective if it has the right people (with the skills and competence appropriate for the task at hand), the right technology (whose infrastructure is reliable and appropriate) as well as the right processes (which reinforce accuracy and reduce the duplication of effort). If any of the three is missing, then the development, efficiency and effectiveness of the EMIS is greatly compromised (Bernbaum, and Moses, 2011; Cassidy, 2006).

In the current study, the researcher considered technology (EMIS equipment) and people (skills and competencies in EMIS educational administrators) as the input; the procedures (collection, recording, analysis, storage and dissemination of educational data) as the processes; and the products (accurate, timely data for the development of informed policies and plans) as the output.

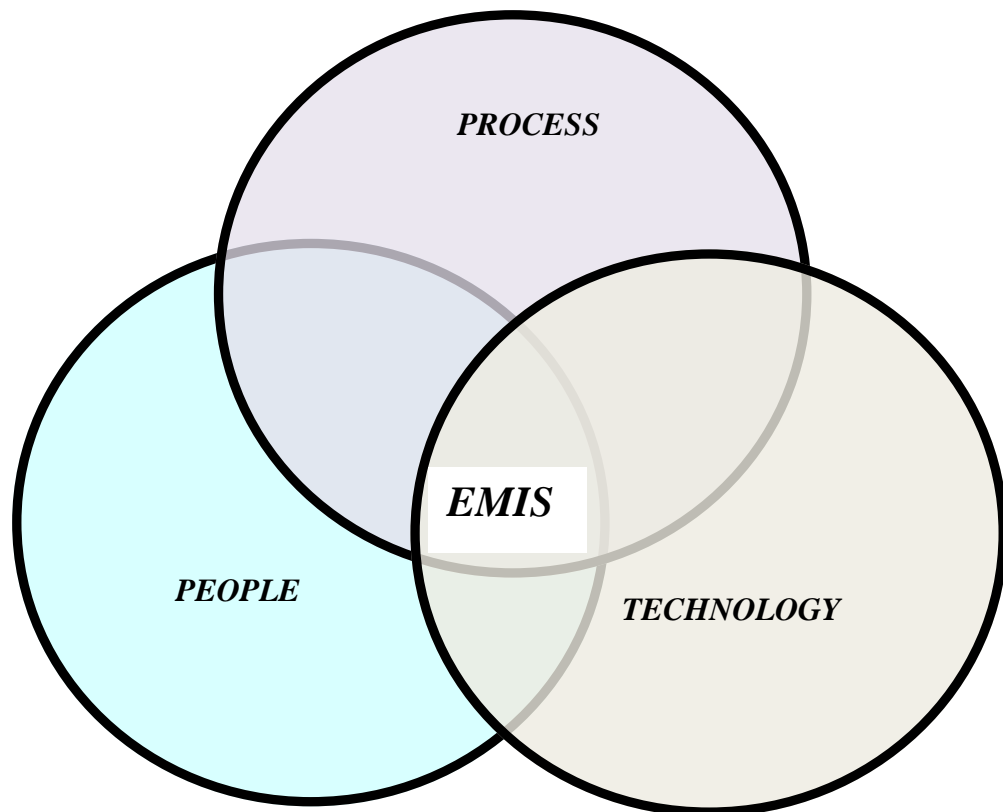
An effective and functional EMIS utilize people, processes and technology to collect school data (raw data) which is analyzed and converted to information which informs decision making process. The development, maintenance and use of EMIS lead to

improved productivity in the education system (Bernbaum and Moses, 2011; Cassidy, 2006 and Kurt, 2001).

For the people to perform their roles effectively, they require the technology (technological infrastructure such as computers) and processes (procedures for data collection, analysis and dissemination). Processes on the other hand cannot be carried out without the people (with the right skills and competences) and technological infrastructure. Further, Kornkaew (2012) found that although technology plays a critical role in EMIS, it is not able to compensate for the inadequate skills and knowledge that people possesses (Kornkaew, 2012). The three components are therefore interrelated. The interrelationship of the three components is what makes a functional and effective EMIS.

Figure 2.1 below shows the conceptual framework of a functional and effective Education Management Information System (EMIS).

**Figure 2.1 Functional Education Management Information System**

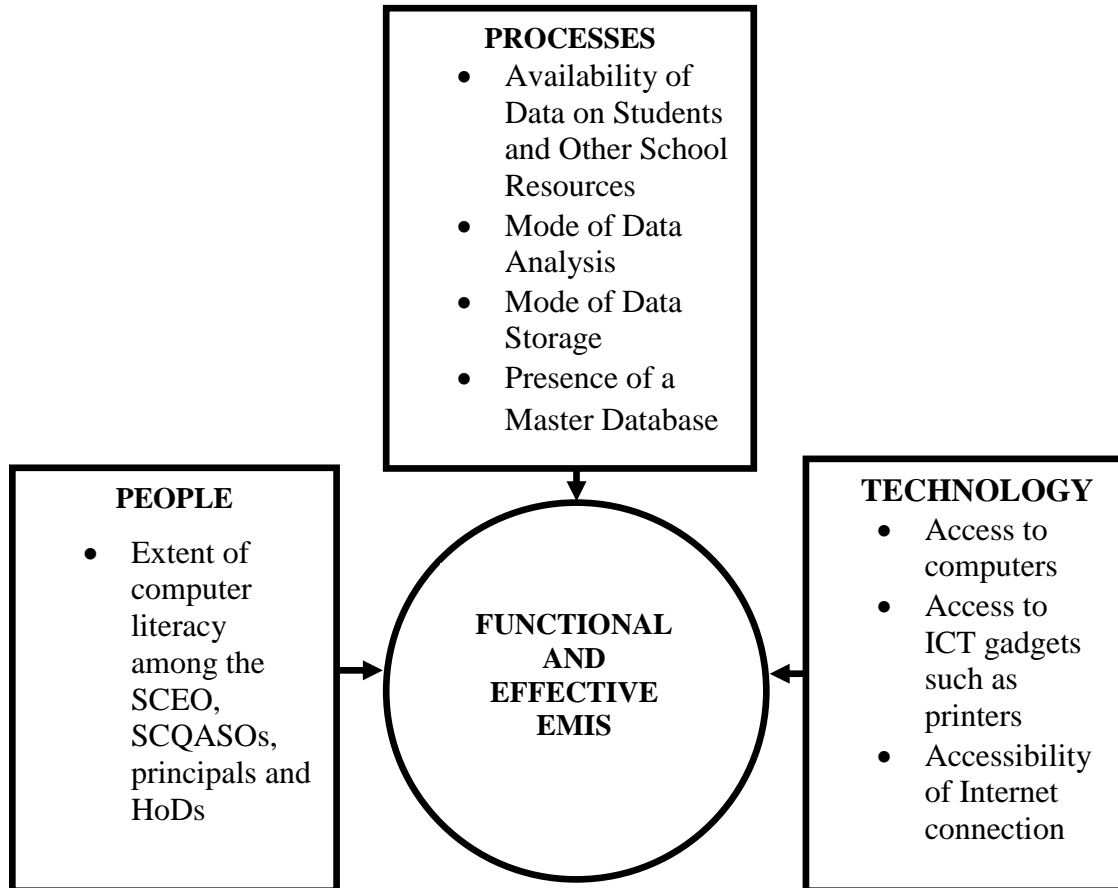


**Source:** Bernbaum and Moses, 2011

## 2.8 Operational Framework

Given the conceptual framework above, the operational framework is as follows:

**Figure 2.2 Operational Framework**



**Source:** Adapted from Walekhwa et al., 2016

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the source of data, the study area, sampling technique, variable description, methods of data analysis used and the ethical considerations for the study.

#### **3.2 Source of Data**

The study used self-administered questionnaires to collect primary data from the Sub-County Education Officer (SCEO), Sub-County Quality Assurance and Standards Officers (SCQASOs), principals and heads of departments (HoDs). The questionnaire for SCEO and SCQASOs captured issues to do with technological infrastructure, computer literacy skills and the extent to which EMIS processes were followed in Limuru Sub-County education office. Similarly, the questionnaire for principals and heads of departments captured issues to do with technological infrastructure, computer literacy skills and the extent to which EMIS processes were followed in public Secondary schools in Limuru Sub-County. The questionnaires are attached to appendix II, III, and IV. The questionnaires had open-ended questions that captured data on challenges experienced by respondents in using EMIS.

#### **3.3 Study Area**

The study was conducted in Limuru Sub- County. Limuru has an estimated area of 281.80 Sq. Km (KNBS, 2009 National Census) and has 24 public secondary schools as of August 2016 (Limuru Sub-County Education Office). The study focused on public secondary schools and the Sub-County education office. The Sub-County lies about thirty kilometers West of Nairobi city.

#### **3.4 Sampling Technique**

The study targeted all the public secondary schools in Limuru Sub-County that had been in existence for at least one year. Two schools were exempted from the study for they failed to meet this threshold. In each of the schools selected, purposive sampling was used to select the principal who filled a self-administered questionnaire that was designed

for principals. Similarly, four heads of departments (HoDs) were purposively sampled from the Mathematics, Languages, Science and Humanities departments and filled a questionnaire designed for HoDs. The respondents were selected for the study because they are involved in the administration in their offices and would supposedly give reliable responses for this study (Kombo and Tromp, 2004). Purposive sampling was suitable because it allowed the researcher to use his judgment to select respondents from schools who were to participate in the study (Peter, 1994).

At the Sub-County education office, purposive sampling was used to select the Sub-County Education Officer (SCEO) and two Sub-County Quality Assurance and Standards Officer (SCQASOs) who participated in the study. Since there was no staff with the designation of the EMIS officer, all issues to do with EMIS were handled by these respondents. A self-administered questionnaire was used to collect responses from all the respondents of this study.

### 3.5 Variable Description

The variables for the study are defined and described in table 3.1 below.

**Table 3.1 Operationalisation of Variables**

<b>TECHNOLOGY</b>	
<b>Variable</b>	<b>Measurement</b>
Access to functional computers for administrative use	The variable established whether schools and Sub-County education office respondents had access to functional computers for administrative purposes. The indicator was rated between 1 and 4 where 1=No/Not at all/Total Lack, 2=some/Sometimes/ somewhat, 3= Most of the time/Mostly and 4=Plenty/always/all/Yes.
Access to ICT gadgets	The variable sought responses on the respondents' access to ICT gadgets in Limuru Sub-County. The indicator was rated between 1 and 4. Where 1=No/Not at all/Total Lack, 2=some/Sometimes/ somewhat, 3= Most of the time/Mostly and 4=Plenty/always/all/Yes.



**Table 3.1 Operationalisation of Variables (continued)**

<b>TECHNOLOGY</b>	
Access to internet connection	The variable established whether respondents (from schools and the Sub-County education office) had access to internet. The indicator was rated at either Yes or No.
<b>PEOPLE</b>	
Extent of computer literacy	The variable established the extent to which respondent's computer literacy skills were sufficient in questionnaire design; data Capture; database management and data cleaning; database packages, data Analysis, data presentation and reporting; graphical data presentation; and data interpretation/statistical report writing. The indicator was rated between 1 and 4. Where 1=No/Not at all/Total Lack, 2=some/Sometimes/ somewhat, 3= Most of the time/Mostly and 4=Plenty/always/all/Yes.
<b>PROCESSES</b>	
Availability of data on students and other school resources	The study sought for responses on the extent to which data was available for use in decision making process. The respondents rated this indicator between 1 and 4. Where 1=No/Not at all/Total Lack, 2=some/Sometimes/ somewhat, 3= Most of the time/Mostly and 4=Plenty/always/all/Yes.
Mode of data analysis	The researcher sought to establish the mode of data analysis used at the Sub-County education's office and the schools. The response was to be either manually (using physical files) or using a computer.
Mode of data storage	The study sought to establish the mode of data storage used at the Sub-County education's office and the schools. The response was to be either manually (keeping physical files in cabinets) or using a computer.
Presence of a master database	The study sought to establish whether the Sub-County education's office and the schools had master databases. The indicator was rated at either Yes or No.

### **3.6 Methods of Data Analysis**

The study utilized quantitative data analysis methods. Quantitative data from the questionnaires were cleaned before they were entered into Ms Excel 2013 spreadsheet, where analysis took place. The data was analyzed using descriptive statistics such as frequencies and percentages to establish the data available on students, mode of data analysis, mode of data storage, presence of a master database, availability of computers and presence of internet. The questionnaires also had open-ended questions which had qualitative aspects. The responses to these questions were organized in major thematic areas to determine the challenges faced by respondents with respect to EMIS. This information was sought from principals, HoDs and the Sub-County education office staff.

### **3.7 Ethical Considerations**

According to Howe and Moses (1999), respondents should be informed of the benefits and risks associated with a study and should chose either to participate or refrain from a study. The respondents were not coerced to participate in the study; their participation was completely voluntary. The respondents were also made aware that they could decline from the study, or leave any question(s) blank that they did not wish to answer. In each questionnaire, the researcher informed the respondents of the purpose of the study and that their responses would remain confidential.

**CHAPTER FOUR**  
**ASSESSMENT OF EDUCATION MANAGEMENT INFORMATION SYSTEM**  
**IN LIMURU SUB-COUNTY**

**4.1 Introduction**

The chapter presents the response rate; distribution of respondents by sex and zones; and the results of the assessment of Education Management Information System (EMIS) in Limuru Sub-County and the discussion of the findings.

**4.2 Response Rate**

The assessment targeted the principals, heads of departments (HoDs), Sub-County Education Officer (SCEO) and Sub-County Quality Assurance and Standards Officers (SCQASOs). The response rates are presented in table 4.1 below. The results show that out of the targeted 22 principals, 18 were reached giving a response rate of 81.8 percent. Out of the targeted 88 heads of departments, 82 were reached giving a response rate of 93.2 percent. On the other hand, the Sub-County Education officer and two Sub-County Quality Assurance and Standards Officer (SCQASOs) were reached giving a response rate of 100 percent. The overall response rate for the study was 91.2 percent. Given that the response rate was good, the data is therefore usable for analysis.

**Table 4.1 Response Rate**

<b>Respondents</b>	<b>Target population</b>	<b>Returned questionnaires</b>	<b>Percent</b>
Principals	22	18	81.8
HoDs	88	82	93.2
SCEO	1	1	100
SCQASOs	2	2	100
	<b>113</b>	<b>103</b>	<b>91.2</b>

**4.3 Distribution of the Respondents by Sex and Zones**

In the current study, the Sub-County Education Officer (female) and two Sub-County Quality Assurance and Standards Officers (male and female) were drawn from the Sub-

County Education Office. On the other hand, 18 principals and 82 HoDs were drawn from public secondary schools in Limuru Sub-County. The background characteristics of the respondents are presented in table 4.2 below. Out of the schools that participated in the study, 2 principals and 8 HoDs were drawn from 2 national schools, 1 principal and 4 HoDs from one County school while 15 principals and 70 HoDs were drawn from 18 Sub-County schools.

**Table 4.2 Distribution of the Respondents by Sex and Zones**

Respondents	Tigoni Zone		Limuru Zone		Ndeiya Zone		Sub-County education office		Total
	M	F	M	F	M	F	M	F	
Principals	2	3	5	2	3	3	-	-	<b>18</b>
HoDs	15	8	18	13	18	10	-	-	<b>82</b>
SCEO	-	-	-	-	-	-	1	-	<b>1</b>
SCQASOs	-	-	-	-	-	-	1	1	<b>2</b>

A total of 62 (60.2 percent) male respondents participated in the study as compared to 41 (39.8 percent) women. Out of 18 principals who participated in the study, 5 were drawn from Tigoni zone, 7 from Limuru zone and 6 from Ndeiya zone. Out of 82 HoDs who participated in the study, 23 were drawn from Tigoni zone, 31 from Limuru zone and 28 from Ndeiya zone. A total of 8 girls' schools, 4 boys' and 10 mixed schools participated in the study.

#### **4.4 Results of Assessment of Education Management Information System in Limuru Sub-County**

The study assessed the adequacy of technological infrastructure that supports Education Management Information Systems in Limuru Sub-County, the adequacy of computer literacy skills among education administrators in Limuru Sub-County and also established the extent to which Education Management Information Systems' processes are followed in Limuru Sub-County.

#### 4.4.1 Results of the Assessment of Technological Infrastructure

The first objective was to assess the adequacy of technological infrastructure that supports Education Management Information Systems in Limuru Sub-County. For the assessment of technological infrastructure, the study collected data on respondent's access to functional computers for administration use, access to ICT gadgets and access to internet. The results for each of the components are presented below.

##### 4.4.1.1 Accessibility to Functional Computers for Administrative Use

The study assessed the accessibility to functional computers for administrative use and the findings are summarized in table 4.3. The findings revealed that 22.2 percent of principals had access to functional computers at all times, 38.9 percent had access most of the time, 11.0 percent had access sometimes while 27.8 percent had total lack of access. The findings revealed that 4.9 percent of HoDs had access to computers always as compared to 35.4 percent who had access most of the time. On the other hand, 31.7 percent had access to functional computers sometimes and 28.0 percent of HoDs had no access to functional computers at all. The respondents from the Sub-County education office had access to functional computers most of the time.

**Table 4.3 Accessibility to Functional Computers for Administrative Use**

Respondents	1=No/Not at all /Total Lack		2=Some/ Sometimes/ Somewhat		3=Most of the time/Mostly		4=Plenty/ always/all/Yes	
	Percent	No	Percent	No	Percent	No	Percent	No
Principal	27.8	5	11.0	2	38.9	7	22.2	4
HoD	28.0	23	31.7	26	35.4	29	4.9	4
Sub-County Education office staff	-	-	-	-	100	3	-	-

Further, the findings revealed that 61.1 percent of principals had access to functional computers at least most of the times. On the contrary, 38.8 percent of principals had either total lack of access to functional computers or had access on rare occasions. On the other hand, 40.3 percent of HoDs had access to functional computers at least most of the

time as compared to 59.7 percent who either did not have access at all or had access on rare occasions. The findings show that principals and the Sub-County education office staff had more access to computers as compared to the HoDs. The study established that those schools which lacked computers either had not been in existence for long or at one point they had computers which broke down or were stolen.

The findings agree with a study to establish the presence of computers and ICT gadgets in Rarienda Sub-County, which observed that 50 percent of principals and 64.3 percent of HoDs rated the presence of computers and other ICT gadgets in their schools between 26-50 percent. Further, the study in Rarienda showed that 78.6 percent of principals and 69.7 percent of HoDs rated the presence of computers to be below average (Walekhwa et al., 2016). However, this could be attributed to the fact that the study in Rarienda assessed the presence of computers and ICT gadget as one indicator while in the current study they were assessed separately. On comparison, the findings revealed that respondents in Limuru Sub-County had more access to computers as compared to their counterparts in Rarienda Sub-County.

Although the findings of this study contrasts a study that established that 86 percent of school heads lacked computers (MOE, 2008), they agree with the findings of a similar study in Thika-West Sub- County which had established that 39 percent of HoDs lacked computers. However, the findings contrast with the same study which reported that all principals had computers (Mugo, 2014). According to the study, there were many principals and HoDs who lacked access to functional computers leading to a conclusion that schools in Limuru Sub-County had limited access to functional computers. On the other hand, the Sub-County education staff had access to functional computers either most of the time or always.

#### **4.4.1.2 Accessibility to ICT Gadgets**

The study assessed the accessibility to ICT gadgets which are peripheral devices required by computers and the findings are summarized in table 4.4 below. The findings show that 27.8 percent of principals had access to ICT gadgets at all time, 33.3 percent had

access most of the time, 5.6 percent had access sometimes and 33.3 percent had no access at all in their schools. Further, 4.9 percent of HoDs had access to ICT gadgets always, 20.7 percent had access most of the time, 35.4 had access sometimes and 39.0 percent had total lack of access to ICT gadgets. The Sub-County education office staff had access to ICT gadgets most of the time in their office.

**Table 4.4 Accessibility to ICT Gadgets**

Respondents	1=No/Not at all /Total Lack		2=Some/ Sometimes/ Somewhat		3=Most of the time/Mostly		4=Plenty/ always/all/Yes	
	Percent	No.	Percent	No.	Percent	No.	Percent	No.
Principals	33.3	6	5.6	1	33.3	6	27.8	5
HoDs	39.0	32	35.4	29	20.7	17	4.9	4
Sub-County Education office staff	-	-	-	-	100	3	-	-

Further, the findings established that 61.1 percent of principals had access to ICT gadgets at least most of the time as compared to 38.9 percent who either lacked access to ICT gadgets or had access on rare occasions. On the other hand 25.6 percent of HoDs had access to ICT gadgets at least most of the time as compared to 74.4 percent who either had no access at all or had access on rare occasions. The Sub-County education office staff had access to ICT gadgets most of the time. The findings revealed that the numbers of principals who had access to functional computers was equal to the number that had access to ICT gadgets. On the contrary, the HoDs had more access to computers as compared to ICT gadgets.

The findings revealed that schools had more computers and compared to ICT gadgets such as printers. In many schools, the ICT gadgets were kept in the secretary's offices hence giving the principals more access as compared to the HoDs. The finding led to a conclusion that most schools in Limuru Sub-County had limited access to ICT gadgets. The ICT gadgets were however accessible to the Sub-County education office staff most of the time. The study established that schools lacked funds to repair the computers and

ICT gadgets when they break down. This could be the cause for the limited access to computers and ICT gadgets by principals and HoDs.

#### 4.4.1.3 Access to Internet Connection

The study sought to establish whether schools and Sub-County education office had access to internet and whether the internet available was broadband or modem. The findings are summarized in table 4.5 and show that all the principals and the Sub-County education office staff had access to the internet. Similarly, 69.5 percent of HoDs had access to the internet as compared to 30.5 percent who did not have access. Out of the respondents who had access to internet, 38.9 percent of principals and 49.1 percent of HoDs used broadband internet where as the three Sub-County education office staff, 61.1 percent of principals and 50.9 percent of HoDs used modem to access the internet.

**Table 4.5 Access to Internet Connection**

Respondents	Yes		No		Total
	Percent	No.	Percent	No.	
Principals	100	18	0	0	<b>18</b>
HoDs	69.5	57	30.5	25	<b>82</b>
Sub-County Education office staff	100	3	-	-	<b>3</b>

The findings of the study revealed that more than half of the schools used modems to access internet due to lack of broadband internet. The lack of broadband internet could be attributed to the fact that the initial cost of installation is high compared to the monthly cost paid to the internet providers. Modems are however easy to acquire but use internet bundles which are expensive to purchase.

The findings of the study are similar to those of a study that established that 82 percent of schools had access to internet for more than 40 hours in a month whereas 18 percent had less than 20 hours of access to the internet per month (Mugo, 2014). The findings however contradict with a study by Kinuthia (2009) which revealed that only 15 percent



of schools had access to the internet. Further, the findings agree with a study that was carried in South Africa which showed that 63 percent of schools had access to the internet (Visvanath and Louis, 2011).

The assessment of technological infrastructure in Limuru Sub- County led to a conclusion that the technological infrastructure in Limuru Sub-County was inadequate. There was need to equip schools with more functional computers, ICT gadgets such as printers and internet connectivity so as to improve the status of EMIS in the schools and the Sub-County education office. Since the Sub-County education office used modem to access internet, there was need for the installation of broadband internet which is cheaper, faster and reliable.

#### **4.4.2 Results of the Assessment of People's Computer Literacy Skills**

The second objective of the study was to determine the adequacy of computer literacy skills among education administrators in Limuru Sub-County. For the assessment of adequacy of people's computer literacy skills, the study collected data on the extent to which Sub-County education office staff, principals and HoDs' skills were sufficient in questionnaire design; data capture; database management and data cleaning; database packages; data analysis; data presentation and reporting; graphical data presentation; and data interpretation and statistical report writing. Table 4.6 presents the summary of the adequacy of computer literacy skills of the Sub-county education office staff. The summaries of adequacy of principals' and HoDs' computer literacy skills are presented in tables 4.7 and 4.8, respectively.

The findings of the study revealed that 66.7 percent of Sub-County education office staff had computer literacy skills that were sufficient always in questionnaire design, data capture, data analysis and data interpretation and statistical report writing. Similarly, 33.3 percent of Sub-County education office staff had skills that were sufficient always in graphical data presentation while all the staff had skills that were sufficient always in data presentation and reporting.

On the other hand, 33.3 percent had skills that were sufficient most of the time in design, data capture, data analysis and data interpretation and statistical report writing. All the staff had skills that were sufficient most of the time in database management and data cleaning and also in database packages as compared to 66.6 percent whose skills were sufficient most of the time in graphical data presentation. In summary, all the respondents from the Sub-County education office had computer literacy skills that were sufficient at least most of the time leading to a conclusion their skills were adequate.

**Table 4.6 Sub-County Education Office Staff Computer Literacy Skills**

Skills	1=No/Not at all/ Total lack		2=Some/ Sometimes/ Somewhat		3=Most of the time/Mostly		4=Plenty/ always/ all/Yes	
	Percent	No.	Percent	No.	Percent	No.	Percent	No.
i) Questionnaire design	-	-	-	-	33.3	1	66.7	2
ii) Data capture	-	-	-	-	33.3	1	66.7	2
iii) Database management and data cleaning	-	-	-	-	100	3	-	-
iv) Database packages	-	-	-	-	100	3	-	-
v) Data analysis	-	-	-	-	33.3	1	66.7	2
vi) Data presentation and reporting	-	-	-	-	-	-	100	3
vii) Graphical data presentation	-	-	-	-	66.6	2	33.3	1
viii) Data interpretation and statistical report writing	-	-	-	-	33.3	1	66.6	2

The findings of the study disagree with those of a survey that established that 24 percent of the Sub-County education staff did not have skills in questionnaire design and a further 51 percent had limited skills. Moreover, 18 percent lacked skills in data analysis presentation and reporting; while 19 percent lack skills in data interpretation and report writing. Only 5 percent of respondents had sufficient skills (MOE, 2008). Further, the findings of this study contradict a study in Rarienda Sub- County that revealed that the Sub-County Education Officer (SCEO) and the Sub- County Quality Assurance Standards Officers (SCQASOs) were computer illiterate (Walekhwa et al., 2016).

As summarized in table 4.7, 16.7 percent of principals had computer literacy skills that were sufficient always in questionnaire design, 44.4 percent had skills that were sufficient most of the time, and 33.3 percent had skills that were sufficient on rare occasions as compared to 5.6 percent of principal had no skills in questionnaire design. In addition, 61.1 percent had skills sufficient at least most of the time in questionnaire design.

**Table 4.7 Principal's Computer Literacy Skills**

Skills	1=No/Not at all/ Total lack		2=Some/ Sometimes/ Somewhat		3=Most of the time/Mostly		4=Plenty/ always/ all/Yes	
	Percent	No.	Percent	No.	Percent	No.	Percent	No.
i) Questionnaire design	5.6	1	33.3	6	44.4	8	16.7	3
ii) Data capture	5.6	1	16.7	3	44.4	8	33.3	6
iii) Database management and data cleaning	16.7	3	38.9	7	38.9	7	5.6	1
iv) Database packages	11.1	2	50	9	33.3	6	5.6	1
v) Data analysis	5.6	1	55.6	10	33.3	6	5.6	1
vi) Data presentation and reporting	5.6	1	44.4	8	38.9	7	11.1	2
vii) Graphical data presentation	22.2	4	38.9	7	22.2	4	16.7	3
viii) Data interpretation and statistical report writing	27.8	5	38.9	7	22.2	4	11.1	2

The study further established that 77.7 percent of principals had sufficient skills most of the time in data capture, 44.5 percent had sufficient skills at least most of the time in database management and data cleaning, 38.9 percent had sufficient skills at least most of the time in data packages and data analysis and 50 percent had sufficient skills at least most of the time in data presentation and reporting. The study found that 38.9 and 33.3 percent of principals had skills that were sufficient at least most of the time in graphical data presentation, and data interpretation and statistical report writing, respectively.

Most principals' skills were sufficient at least most of the time in questionnaire design and data capture whereas they were either sufficient sometimes or were totally lacking in database management and data cleaning; database packages; data analysis; data presentation and reporting; graphical data presentation; and data interpretation and statistical report writing. The findings present a scenario whereby most principals lack skills that are necessary for operationalisation of EMIS. The findings led to a conclusion that principals' computer literacy skills were inadequate and there was need for in-service training.

The findings of this study are similar to those of a study that was carried out in Iraq and revealed that most teachers had not attended any in-service training course for a long period of time (Kendall, 2012). The findings of this study led to a conclusion that computer literacy skills among the Sub-County education office staff were adequate while those of principals and HoDs were inadequate and could be attributed to the lack of regular training and a negative perception that makes the respondents not to attend such trainings when they are organized.

The results in table 4.8 revealed that 37.8 percent of HoDs had skills that were sufficient always or most of the time in questionnaire design while 62.2 percent either had skills that were sufficient on rare occasions or they had total lack of skills. In data capture, 62.2 percent of HoDs had skills that were sufficient at least most of the time. In regard to database management and data cleaning, 34.2 percent of HoDs has sufficient skills at least most of the time. On the other hand, 37.8 percent, 40.3 percent and 41.5 percent of HoDs had skills that were sufficient at least most of the time in database packages; data analysis; and data presentation and reporting, respectively. In addition, 36.6 percent and 34.2 percent of HoDs had skills that were sufficient at least most of the time in graphical data presentation; and data interpretation and statistical report writing, respectively.

**Table 4.8 HoDs' Computer Literacy Skills**

Skills	1=No/Not at all/ Total lack		2=Some/ Sometimes/ Somewhat		3=Most of the time/Mostly		4=Plenty/ always/ all/Yes	
	Percent	No.	percent	No.	Percent	No.	Percent	No.
i) Questionnaire design	14.6	12	47.6	39	20.7	17	17.1	14
ii) Data capture	4.9	4	32.9	27	31.7	26	30.5	25
iii) Database management and data cleaning	22.0	18	43.9	36	22.0	18	12.2	10
iv) Database packages	25.6	21	36.6	30	25.6	21	12.2	10
v) Data analysis	22.0	18	37.8	31	18.3	15	22.0	18
vi) Data presentation and reporting	20.7	17	37.8	31	28.1	23	13.4	11
vii) Graphical data presentation	29.3	24	34.1	28	23.2	19	13.4	11
viii) Data interpretation and statistical report writing	26.8	22	39.0	32	23.2	19	11.0	9

According to the findings, most HoDs (62.2 percent) had skills that were at least sufficient most of the times in data capture. Most of the HoDs had total lack of skills or had skills that were sufficient sometimes in questionnaire design; database management and data cleaning; database packages; data analysis; data presentation and reporting; graphical data presentation; and data interpretation and statistical report writing. The findings further reveal that the HoDs had limited skills as compared to principals. The finding led to a conclusion that the Sub-County education office staff had adequate skills while the principals and HoDs had inadequate skills.

Further, the study established whether the respondents had attended any in-service training to improve on their computer literacy skills and the duration when such training occurred. The findings are summarized in table 4.9 and revealed that all the Sub-County

education office staff had been trained 0-2 years back. This could account for the fact that all of them were computer literate. On the contrary, 5.6 percent of principals and 31.7 percent of HoDs had never attended an in-service training during their tenure of service. Further, 8.5 percent of principals and 6.1 percent of HoDs had been trained between 0 and 2years back, 33.3 percent of principals and 45.1 percent of HoDs had been trained between 3 and 5years; 16.7 percent of principals and 9.8 percent of HoDs had attended in-service training between 6 and 8years back whereas 5.6 percent of principals and 7.3 percent of HoDs had attended an in-service training nine and above years back.

**Table 4.9 In-service Training**

	No training		0-2yrs		3-5yrs		6-8yrs		9 years and above	
	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.
<b>Principal</b>	5.6	1	8.5	7	33.3	6	16.7	3	5.6	1
<b>HoD</b>	31.7	26	6.1	5	45.1	37	9.8	8	7.3	6
<b>Sub-County Education Office staff</b>	-	-	100	3	-	-	-	-	-	-

#### **4.4.3 Result of Assessment of Processes**

The third objective of this study was to establish the extent to which Education Management Information Systems’ processes were followed in Limuru Sub-County. For the assessment of the processes, the study collected data on availability of data on students and other school resources; mode of data analysis; mode of data storage; and presence of a master database. The results for each of the variables are presented below.

##### **4.4.3.1 Availability of Data on Students and Other School Resources**

Since data collection in one of the process of EMIS, the study established the extent to which data on students and other school resources were available. The data included student’s enrolments, classroom profile, students with special needs and other resources such as textbooks and physical facilities. The findings are summarized in table 4.10 and reveal that 72.2 percent of principals always had data on students and other schools

resources, 16.7 percent had the data most of the time while 11.1 percent had the data sometimes. On the other hand, 57.3 percent of HoDs always had data on students and other schools resources, 14.6 percent had the data most of the time, 25.6 percent had the data on rare occasions while 2.4 percent did not had such data at all. The Sub-County education office staff always had data on students and other schools resources.

The findings revealed that data on students and other schools resources was kept to a large extent by the schools and the Sub-County education office. This can be illustrated by the fact that 88.9 percent of principals, 71.9 percent of HoDs and all the Sub-County education office staff had the data at least most of the time.

**Table 4.10 Availability of Data on Students and other School Resources**

	1=No/Not at all/ Total Lack		2=Some/ Sometimes/ Somewhat		3=Most of the time/Mostly		4=Plenty/ always/ all/Yes	
	Percent	No.	Percent	No.	Percent	No.	Percent	No.
Principal	-	-	11.1	2	16.7	3	72.2	13
HoDs	2.4	2	25.6	21	14.6	12	57.3	47
Sub-County Education office staff	-	-	-	-	-	-	100	3

This findings of this study agrees with a study that was carried out in Rarienda Sub-County that revealed that the Sub-County education office staff, 64.3 percent of principals and 75 percent of HoDs had data on students and other school resources to an extent of 76-100%. Further, majority of respondents in both studies ranked the availability of data on students and other school resource at above average (Walekhwa et al., 2016). The finding revealed that data on students and other school resources was available at the Sub-County education office staff and the schools to a large extent.

#### 4.4.3.2 Mode of Data Analysis

The study established the mode used by the schools and the Sub-County education office in analyzing data. Data analysis is one of the EMIS processes. The responses expected were either manually or using a computer. The findings are summarized in table 4.11 and indicated that 77.7 percent of the principals used computers to analyse data while 22.2 percent analysed data manually. Similarly, 75.6 percent of HoDs analysed data using computers while 24.4 percent analysed the data manually. The finding further revealed that computers were used to analyse data at the Sub-County education office. The fact that most respondents used computers to analyze data could be attributed to the fact that computers helps to make the work faster and are more accurate. Inadequacy of computers was identified as the cause for manual analysis of data in Limuru Sub-County.

**Table 4.11 Mode of Data Analysis**

Respondents	Manually		Using a Computer	
	Percent	No.	Percent	No.
Principals	22.2	4	77.8	14
HoDs	24.4	20	75.6	62
Sub-County Education office staff	-	-	100	3

The findings of this study contradict with a study that was carried out in Rarienda Sub-County that reported that 21 (75 percent) principals and 92 (82.1 percent) HoDs analyzed students' data manually (Walekhwa et al., 2016). The findings revealed that the Sub-County office and most of the schools used computers to analyze data. The respondents who reported to analyze data using the computer were more than those who reported to have access to computers. This could be attributed to the fact that a single computer in the school can be used to analyze all the data that is produced in that school.

#### 4.4.3.3 Mode of Data Storage

After the data has been analyzed, it is then stored securely in a manner that it can be easily retrieved whenever required. The study established the mode used to store data in the schools and the Sub-County education's office. The responses expected were manual,



using a computer or both and are summarized in table 4.12. The findings revealed that 38.9 percent of principals used a computer to store data, 33.3 percent stored data manually whereas 27.8 percents used both computers and physical files. On the other hand, 59.8 percent of HoDs used computers, 28.0 percent stored the data manually whereas 1.2 percent used both computers and physical files to store data. The Sub-County education office staff used computers to store data.

**Table 4.12 Mode of Data Storage**

Respondents	Manually		Using a Computer		Both	
	Percent	No.	Percent	No.	Percent	No.
Principals	33.3	6	38.9	7	27.8	5
HoDs	28.0	23	59.8	49	12.2	10
Sub-County Education office staff	-	-	100	3	-	-

The finding revealed that five schools stored the data both in the computer and physical files. Power outages in Kenya could be the main cause that led the schools to store the data in both physical files and computers. Schools cannot access data in computer when there are power outages unless they have a backup generator to provide electric power. Schools also fear losing data especially when computers are stolen and the data was not stored in hard copies.

These findings contradict a study in Rarienda Sub-County which had revealed that the Sub-County education office staff, most principals and HoDs store data manually (in physical files). The results could be attributed to the number of computers available and the computer skills possessed by the respondents (Walekhwa et al., 2016). The finding led to a conclusion that data was stored to a great extent and most respondents stored data using computers.

#### **4.4.3.4 Presence of a Master Database**

The study aimed to establish whether the schools and the Sub-County education's office had a master database where data on students and other school resources were stored. The

data from the master database is always stored in a user-friendly form and disseminated to education stakeholders when required. The findings of the study are summarized in table 4.13 and reveal that 88.9 percent of principals had a master database as compared to 11.1 percent who reported to lack such a database. Similarly, 92.7 percent of HoDs had a master database while 7.3 percent did not have. Respondents from the Sub-County education office reported to have a master database.

**Table 4.13 Presence of a Master Database**

Respondents	Yes		No	
	Percent	No.	Percent	No.
Principals	88.9	16	11.1	2
HoDs	92.7	76	7.3	6
Sub-County Education office personnel	100	3	-	-

The findings contrast with a study in which only six (21.4 percent) principals and 11(9.8 percent) HoDs reported to have a master database. On the contrary, the findings revealed that the three Sub-County education office staff had a master database (Walekhwa et al., 2016). The difference could be attributed to the fact that the MOE had emphasized on the need for accurate data especially after the introduction of FDSE. The finding revealed that the Sub-County office and most schools had master databases and they were computerized. The findings contrast a survey which established that EMIS processes do not flow clearly (MOE, 2008).

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

The chapter presents the summary of the key findings of the study, the status of EMIS in Limuru Sub-County, conclusion as well as the recommendations and suggestions for further studies.

#### 5.2 Summary

The study assessed the status of EMIS in Limuru Sub-County by answering the research question: is the Education Management Information System (EMIS) in Limuru Sub-County functional and effective? The specific objectives of the study were: to assess the adequacy of technological infrastructure that supports Education Management Information Systems in Limuru Sub-County; to determine the adequacy of computer literacy skills among education administrators in Limuru Sub-County; and to establish the extent to which Education Management Information Systems' processes were followed in Limuru Sub-County.

The study collected primary data from the Sub-County Education Officer, two Sub-County Quality Assurance and Standards Officers, 18 principals and 82 Heads of departments through self-administered questionnaires. The study targeted all the 24 public secondary schools in Limuru Sub-County. However, two schools were exempted from the study because they had been in existence for less than a year and therefore did not meet the minimum threshold. The schools that participated in the study included two national, One County and 19 Sub-County schools. Out of 113 questionnaires administered, 103 were returned duly filled leading to 91.2 percent return rate. Out of the 103 questionnaires received, there were 62 men and 41 female respondents. Given that the response rate was acceptable, the data is therefore usable for analysis.

In assessing the adequacy of technological infrastructure, the study determined the access to functional computers, ICT gadgets and internet connection. The findings revealed that principals and the Sub-County education office staff had more access to computers as

compared to the HoDs. The study established that those schools which lacked computers either had not been in existence for long or at one point they had computers which broke down or were stolen. The findings further revealed that the numbers of principals who had access to functional computers was equal to the number that had access to ICT gadgets. The findings show that HoDs had more access to computers as compared to ICT gadgets. Schools had more computers and compared to ICT gadgets such as printers. The ICT gadgets were accessible to the Sub-County education office staff most of the time.

The findings established that the Sub-County education office staff and all the principals had access to internet as compared to the HoDs. The findings of the study revealed that more than half of the schools used modems to access internet due to lack of broadband internet. The findings led to a conclusion that the technological infrastructure in Limuru Sub-County was inadequate. There was need to equip schools with more functional computers, ICT gadgets such as printers and internet connectivity so as to improve the status of EMIS in the schools and the Sub-County education office.

The study assessed the adequacy of computer literacy skills among the Sub-County education office staff, principals and HoDs. The findings revealed that the skills possessed by HoDs were limited as compared to those possessed by the principals and the Sub-County education office staff. Further, computer literacy skills among the Sub-County education office staff were sufficient most of the time while those of principals and HoDs were inadequate and could be attributed to the lack of regular training and a negative perception that makes the respondents not to attend such trainings when they are organized. The findings led to a conclusion that computer literacy skills of respondents from schools and the Sub-County education office in Limuru Sub-County were inadequate.

To determine the extent to which EMIS processes were followed in Limuru Sub-County, the extent to which data on students and other school resources were available, mode of data storage, mode of data analysis and presence of a master database were assessed. The study established that the Sub-County education office staff always had data on students

and other school resources available in their office. The findings revealed that the Sub-County office and most of the schools used computers to analyze data. The respondents who reported to analyze data using the computer were more than those who reported to have access to computers. The study established that data was stored to a great extent and most respondents stored data using computers. The findings led to a conclusion that most schools and the Sub-County education office followed EMIS processes most of the time. The findings led to a conclusion that most schools and the Sub-County education office followed EMIS processes most of the time.

### **5.3 Conclusion**

The general objective of the study was to assess the status of EMIS in Limuru Sub-County. The findings of the study led to the conclusion that Education Management Information System in Limuru Sub-County is functional but not effective. The study assessed the adequacy of technological infrastructure that supports EMIS and established that the technological infrastructure in Limuru Sub-County was inadequate. The study established that Sub-County education office staff had computer literacy skills that were sufficient in questionnaire design; data capture; database management and data cleaning; database packages; data analysis; data presentation and reporting; graphical data presentation; and data interpretation and statistical report writing most of the time hence adequate. On the other, principals and HoDs' computer literacy skills that were found to be inadequate. Further most schools and the Sub-County education office followed the EMIS processes most of the time.

From the foregoing findings, there is need for improvement in the component of technological infrastructure and computer literacy skills so as to improve the functionality and effectiveness of EMIS in Limuru Sub-County. Although the Sub-County education office staff had adequate computer literacy skill, the skills of principals and HoDs were inadequate hence the need to an in- service training. Since that components of EMIS are interrelated, EMIS cannot be effective until all the components are functioning as required.

## **5.4 Recommendations**

After analysis of the findings of this study, the following recommendations were made on policies, programs and future research:

### **5.4.1 Recommendations for Policy and Programs**

In view of the findings of the study, the Ministry of Education (MOE) should plan on how to equip all the schools with technological infrastructure to improve the functionality of EMIS and also learning outcomes of the students. The study established that investment done in terms of computer and ICT gadgets was inadequate. The ministry of education should also provide funds for purchase, repair, maintenance and upgrading of computers and other ICT gadgets. Such financial allocations should be factored in the state annual budget for education.

The researcher recommends that the ministry of education should organize training for all teachers in leadership positions on regular basis. The training would help to improve the accuracy and timeliness when handling EMIS data, improve computer literacy skills which are inadequate and also boost the competence of teachers. The study further recommends that the Ministry of education should enforce the policy requiring all the schools to follow the EMIS processes stipulated for EMIS. By doing so respondents would collect, analyze and disseminate data and information that are accurate and reliable for use in the decision making processes.

### **5.4.2 Recommendations for Future Research**

The study was restricted to Limuru Sub-County, the researcher recommend that similar studies should be carried in the neighboring Sub-Counties so as to ascertain the status of EMIS in Kiambu County. This study was limited to public secondary schools in Limuru Sub-County. There is need for research in private secondary schools in Limuru Sub-County to establish whether EMIS is functional and effective in the private secondary schools. The study should also be replicated in primary schools in Limuru Sub-County and other levels of education such us early childhood schools, government sponsored colleges and universities.

The study was limited to the components of a functional and effective EMIS which are technology, people and processes. Studies on perceived ease-of-use by principals and HoDs; the accuracy and completeness of data collected using EMIS should be carried out to establish whether EMIS helps to improve the quality of data. Further, studies should be carried out to determine whether data generated by EMIS is used in the decision making process.

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## **APPENDICES**

### **Appendix I: Respondents Consent Letter**

Dear participant,

I invite you to participate in this study entitled “Assessment of Education Management Information System (EMIS) in Kenya: a case study of Limuru Sub-County, Kiambu County, Kenya”. I am currently enrolled in Masters of Arts in Monitoring and Evaluation of population and development programme at the Population Studies and Research Institute (PSRI), University of Nairobi and am in the process of writing a project. The purpose of this research is to determine the status of EMIS which responds to the demand for the right data and data-driven decisions which is constantly growing globally. The study seeks response from Sub-County Education officer (SCEO), Sub-County Quality Assurance and Standards Officers (SCQASOs), principals and Heads of Departments (HoDs) in Limuru Sub-County.

Your participation in this research is completely voluntary. You may decline altogether, or leave blank any questions you don't wish to answer. Your responses will remain confidential and anonymous. Data from this research will be kept under lock and key and reported only as collective combined total. No one except the researcher will have access to the responses given.

Thanks for your assistance in this important endeavor.

Yours sincerely,

JACKSON WAWERU.

**Appendix II: Questionnaire for the SCEO AND SCQASOs**

Please tick where appropriate.

**SECTION A: GENERAL INFORMATION**

Name of the Sub-County.....

- Positions:       Sub-County Education Officer  
                       Sub-County Quality Assurance and Standards Officer  
                       EMIS unit Personnel
- Sex:                Male       Female

**SECTION B: TECHNOLOGICAL INFRASTRUCTURE**

1. Do you have computers in your office?  
                           Yes                     No
2. If Yes, is the number of functional computers sufficient for you to perform your administration tasks? Please rate their adequacy by ticking where appropriate.

	No/Not at all /Total Lack	Some/ Sometimes/ Somewhat	Most of the time/Mostly	Plenty/ always/ all/Yes
Access to functional computers for administrative use				
Access to ICT gadget such as printers.				

3. Is internet available in your office?      Yes       No
4. If Yes, specify the source of the internet used  
                           Broadband       Modem

**SECTION C: SKILLS**

5. Are you computer literate?      Yes       No
6. If YES, to what extent are your computer skills sufficient in the following? (Even if the number of functional computers is insufficient).

	No/Not at all/ Total lack	Some/ Sometimes/ Somewhat	Most of the time/Mostly	Plenty/ always/ all/Yes
i)Questionnaire design				
ii) Data capture				
iii)Database				

management and data cleaning				
iv) Database packages				
v) Data analysis				
vi) Data presentation and reporting				
vii) Graphical data presentation				
viii) Data interpretation and statistical report writing				

7. Have you ever attended an in-service training to enhance your computer literacy skills since you were employed?  Yes  No

8. If Yes, When did you attend such a training last?

0-2years	
3-5year	
6-8years	
9yrs and above	

9. On average what percentage of school returns the EMIS data return questionnaires before the set deadline?.....

10. To what extent do the procedures and schedules for data collection, cleaning, analysis and flow clearly?.....  
 .....  
 .....

11. To what extent is data from schools spot checked for accuracy and completeness?.....  
 .....  
 .....

12. What are the main causes of delay in submitting data required by Sub-County Education Office?.....  
 .....  
 .....  
 .....

13. What recommendations would you give to improve the Education Management Information Systems (EMIS) in the schools?

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

14. What recommendations would you give to improve the Education Management Information Systems (EMIS) at the Sub-County Education's Office?

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

**THANKS FOR YOUR RESPONSES**

**Appendix III: Questionnaire for Principals**

Please tick where appropriate.

**SECTION A: GENERAL INFORMATION**

Name of the School.....

Type of School:      National       County       Sub-County

Sex of respondent:              Male       Female

**SECTION B: TECHNOLOGICAL INFRASTRUCTURE**

1. Do you have computers in your school?

Yes       No

2. If Yes, is the number of functional computers sufficient for you to perform your administration tasks? Please rate their adequacy by ticking where appropriate.

	No/Not at all /Total Lack	Some/ Sometimes/ Somewhat	Most of the time/ Mostly	Plenty/ always/ all/Yes
Access to functional computers for administrative use				
Access to ICT gadget such as printers.				

3. Is internet available in your office?      Yes       No

4. If Yes, specify the source of the internet used

Broadband       Modem

**SECTION C: SKILLS**

5. Are you computer literate?      Yes       No

6. If YES, to what extent are your computer skills sufficient in the following? (Even if the number of functional computers is insufficient).

	No/ Not at all/ Total lack	Some/ Sometimes/ Somewhat	Most of the time/ Mostly	Plenty/ always/ all/Yes
i) Questionnaire design				
ii) Data capture				
iii) Database management and data cleaning				
iv) Database packages				
v) Data analysis				

vi) Data presentation and reporting				
vii) Graphical data presentation				
viii) Data interpretation and statistical report writing				

7. Have you ever attended an in-service training to enhance your computer literacy skills since you were employed?  Yes  No

8. If Yes, When did you attend such a training last?

0-2years	
3-5year	
6-8years	
9yrs and above	

**SECTION D: PROCESSES**

1. To what extent are the procedures and schedules for data collection, data processing, data analysis, reporting, publication, dissemination and feedback followed?

No/Not at all/Total lack	
Some/Sometimes/Somewhat	
Most of the time/Mostly	
Plenty/always/all/Yes	

2. Which mode of data analysis is frequently used?

- a) Manual     b) Computerized   
c) Other ..... (Please specify)

3. Which mode of data storage is frequently used?

- a) Using physical files     b) Using computers   
c) Other ..... (Please specify)

4. Does the school have a master database containing data on students and other resources?

- Yes     No

5. If Yes, in which form is the database?

- a) Manual     b) Computerized     c) Other .....( specify)

6. To what extent are the following documents used in the school administration?

	No/Not at all/Total lack	Some/Sometimes/Somewhat	Most of the time/Mostly	Plenty/always/all/Yes
i)School admission register				
ii)Class attendance registers				
iii)Fees Register				
iv)Staff Returns				
v) Text books issue list				

**SECTION E: TIMELINESS IN SUBMITTING DATA RETURNS**

7. Do you submit the EMIS data returns to the Sub-County Education’s office on time? Please rate your timeliness

No/Not at all/Total lack	
Some/Sometimes/Somewhat	
Most of the time/Mostly	
Plenty/always/all/Yes	

8. Which technological challenges do you face in handling data in the school?

.....  
 .....

9. Which challenges associated with skills do you face in handling data in the school?

.....  
 .....

10. Which challenges do you face in following the processes of data collection, analysis and storage?.....

.....

**THANK YOU FOR YOUR RESPONSES**

## Appendix IV: Questionnaires for Heads of Departments

Please tick where appropriate.

### **SECTION A: GENERAL INFORMATION**

Name of the School.....

Type of School:      National       County       Sub-County

Sex of respondent:              Male       Female

### **SECTION B: TECHNOLOGICAL INFRASTRUCTURE**

1. Do you have computers in your school?

Yes       No

2. If Yes, is the number of functional computers sufficient for you to perform your administration tasks? Please rate their adequacy by ticking where appropriate.

	No/Not at all /Total Lack	Some/ Sometimes/ Somewhat	Most of the time/Mostly	Plenty/ always/ all/Yes
Access to functional computers for administrative use				
Access to ICT gadget such as printers.				

3. Is internet available in your office?      Yes       No

4. If Yes, specify the source of the internet used

Broadband       Modem

### **SECTION C: SKILLS**

1. Are you computer literate?      Yes       No

2. If YES, to what extent are your computer skills sufficient in the following? (Even if the number of functional computers is insufficient).

	No/ Not at all/ Total lack	Some/ Sometimes/ Somewhat	Most of the time/ Mostly	Plenty/ always/ all/Yes
i) Questionnaire design				
ii) Data capture				
iii) Database management and data				



cleaning				
iv) Database packages				
v) Data analysis				
vi) Data presentation and reporting				
vii) Graphical data presentation				
viii) Data interpretation and statistical report writing				

3. Have you ever attended an in-service training to enhance your computer literacy skills since you were employed?  Yes  No

4. If Yes, when did you attend such a training last?

0-2years	
3-5year	
6-8years	
9yrs and above	

**SECTION D: PROCESSES**

5. To what extent do the procedures and schedules for data collection, data processing, data analysis, reporting, publication, dissemination and feedback followed?

No/Not at all/Total lack	
Some/Sometimes/Somewhat	
Most of the time/Mostly	
Plenty/always/all/Yes	

6. Which mode of data analysis is frequently used?

a) Manual

b) Computerized

c) Other ..... (Please specify)

7. Which mode of data storage is frequently used?

a) Using physical files

b) Using computers

c) Other ..... (Please specify)

8. Does the school have a master database containing data on students and other resources?

Yes

No

9. If Yes, in which form is the database?

a) Manual

b) Computerized

c) Other ..... (Please specify)

10. If Yes in no. 14 above, which data is contained in the master database? Tick where appropriate.

Student enrolments

Staffing profiles

Classroom profiles

Students with disabilities and orphans

Textbooks

School finances and expenditures

School facilities

11. Which technological challenges do you face in handling data in the school?

.....

12. Which challenges associated with skills do you face in handling data in the school?.....

.....

13. Which challenges do you face in following the processes of data collection, analysis and storage?.....

.....

**THANK YOU FOR YOUR RESPONSE**

**Appendix V: Public Secondary Schools in Limuru Sub-County**

	<b>SCHOOLS</b>	<b>ZONE</b>
1	LORETO HIGH SCHOOL	TIGONI
2	LIMURU GIRLS	TIGONI
3	TIGONI SECONDARY SCHOOL	TIGONI
4	GICHURU HIGH SCHOOL	TIGONI
5	NGECHA GIRLS	TIGONI
6	NYANJEGA SECONDARY	TIGONI
7	MUNA SECONDARY SCHOOL	TIGONI
8	NGARARIGA GIRLS SEC. SCH	LIMURU
9	BIBIRIONI BOYS SEC. SCH	LIMURU
10	KINYOGORI HIGH SCH	LIMURU
11	RIRONI SEC. SCH	LIMURU
12	MANGUO SEC SCHOOL	LIMURU
13	NGENIA HIGH SCHOOL	LIMURU
14	KAMANDURA GIRLS SEC. SCH	LIMURU
15	KAMIRITHU SEC SCHOOL	LIMURU
16	MIRITHU SEC. SCHOOL	NDEIYA
17	ST MARYS GIRLS	NDEIYA
18	THIGIO BOYS	NDEIYA
19	MAKUTANO SEC. SCHOOL	NDEIYA
20	NDUNGU NJENGA BOYS	NDEIYA
21	NDUNGU GIRLS	NDEIYA
22	NGUIRUBI MIXED SEC	NDEIYA
23	GATUURA SEC. SCHOOL	NDEIYA
24	MUKOMA SEC. SCHOOL	NDEIYA

**Appendix VI: Letter of Introduction**



**UNIVERSITY OF NAIROBI**  
**POPULATION STUDIES AND RESEARCH INSTITUTE**  
**DIRECTOR'S OFFICE**

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**P.O. BOX 30197-00100**  
**Nairobi KENYA**

**Our Ref: Q56/75333/2014**

**Date: July 21, 2016**

**TO WHOM IT MAY CONCERN**

**RE: JACKSON MUHIA WAWERU- Q51/75333/2014**

This is to confirm that the above named is a 2<sup>nd</sup> year Master of Arts student in Monitoring and Evaluation at Population Studies and Research Institute (PSRI), at the University of Nairobi.

He is in the process of collecting data for a proposal entitled "Assessment of Education Management Information System (EMIS) in Kenya: A case study of Limuru Sub-County, Kiambu County, Kenya."

Any assistance accorded to him will be highly appreciated.

A blue ink signature of Murungaru Kimani is written over a blue rectangular stamp. The stamp contains the text: "DIRECTOR", "POPULATION STUDIES &amp; RESEARCH INSTITUTE", and "UNIVERSITY OF NAIROBI".

**Murungaru Kimani, PhD**  
**Director, PSRI**  
**and**  
**Associate Professor**