DETERMINANTS OF ADOPTION OF EDUCATION MANAGEMENT INFORMATION SYSTEM FOR DATA MANAGEMENT IN SECONDARY SCHOOLS IN CHESUMEI SUB COUNTY-KENYA

RACHAEL CHEPNGETICH

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DECLARATION

This Research project is my original work and has not been presented for a degree to any other university

RACHAEL CHEPNGETICH

E55/OO12/2020

Signature……Date 11/12/2023

This Research project has been submitted for examination with our approval as the university supervisors

DR RUTH JEPKEMBOI CHOGE

Senior lecturer,

Department of Educational Management, Policy and Curriculum studies

School of Education

Koitaleel Samoeei University

Signature……Date 11-12-2023

DR PAUL EJORE

Lecturer,

Department of Educational Foundations

School of Education

Nairobi University

Signature……Date 11/12/2023

DEDICATION

I would like to dedicate this Research project to my entire family, especially my caring and loving husband Tiongik Philip for the moral and financial support and my beautiful daughters Jepchumba, Jepkirui, Jelagat and my beloved son Kipyego for their patience and support during my academic journey.

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ACRONYMN

ADEA…….Association for Development of Education in Africa

CBC……Competency Based Curriculum

CDF……..Constituency Development Fund

EMIS…….Education Management Information System

ICT……..Information and Communication Technology

NEMIS……..National Education Management Information System

TSC……..Teacher Service Commission

UNESCO…..United Nations Educational, Scientific and Cultural Organization

UNICEF……United Nations International Children's Emergency Funds

MOE……..Ministry of Education

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ABSTRACT

This study sought to establish the determinants of implementing Education management information system by secondary schools of chesumei sub-county Kenya. The Kenyan government through the Ministry of Education and the Ministry of Information Communication and Technology has since 2008 created a policy for ICT adoption in the education system the implementation has been affected by varied factors. This study therefore investigated the determinants of EMIS adoption in secondary schools in chesumei Sub County. The Study is based on four objectives: To establish the availability of centralization of data management in secondary schools of chesumei Sub County; The level of principals knowledge and skills in use of EMIS; Infrastructure availability in schools; the administrative support in the utilizing of EMIS. The research used descriptive survey to gather data Kothari (2000). Target population; Chesumei sub-county has 42 schools. The sampled population was achieved by using 30% of the target population this led to 13 sample schools. The research used simple random selection and purposeful selection of the Sub County director of education. The study used questionnaires, interviews and observation method to collect data. Validity of the content was determined through piloting. Test retest was also used to determine the reliability of research instrument. Data was analyzed using qualitative and quantitative methods. The findings indicated insufficient centralized data management system; Principals have basic skills in computer technology. Insufficient administrative support and schools lack education management information system infrastructure therefore the conclusion was that Education Management Information System in Chesumei Sub County is functional but not effective. The study therefore recommends to the ministry of education to create policy framework on school level data management system and create a functioning ICT department to guide in the EMIS adoption

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

This chapter provides background information of the study the objectives, research questions and the organization of the study .The incorporation of Education Management Information Systems (EMIS) in educational institutions has become increasingly popular in recent years. The goal is to improve different aspects of teaching and learning in education, EMIS refers to the use of digital tools and technologies to enhance the management, analysis, and accessibility of educational data. It also serves to promote communication and collaboration among the various stakeholders in the education ecosystem.

EMIS has been adopted by several countries for decades now. Initially EMIS was just simple administrative tool however; EMIS has now grown into a more complex system enveloping several aspects of educational activities administration finance correspondence e-learning and human resource among other aspects .Many developed countries like USA, France, China and Canada have adopted and embraced EMIS.

International conference that was held in Paris France in April 2018 identified the following as drivers of EMIS implementation; Technological change such as internet that facilitate data collection and processing, increased expectation from

stakeholders planners and development partners on detail and use of data, evolving national and international standards and monitoring of Sustainable Development Goals (SDG) as well as increased accountability to the public. There was also an increased complexity of education systems (UNESCO (2008) these are important factors however country's political stability and government support in the implementation of EMIS was not considered. Availability of ICT infrastructure was also not linked as a factor to adoption of EMIS in the conference.

The United States of America is among the first nation to adopt EMIS for education .It started implementing early versions of EMIS as early as the 1960 to collect data on students, teachers, and schools for planning and policymaking Purposes, In the 1970, EMIS was used for advanced reporting and analysis. In the 1980, EMIS became more integrated into the educational decision-making process. In the 1990, EMIS was used to support strategic planning and policy development. In the 2000, EMIS increased its focus on student achievement and responsibility. Today, EMIS is used to support a wide range of educational activities, from data-driven decision-making to program evaluation and improvement. (Kevin, Parker, Davey (2014)

The development of EMIS in US education has been characterized by increasing sophistication and integration into the educational decision-making process, ultimately leading to greater accountability and better student achievement. The

complexity of EMIS and its continued transformation from simple tools to powerful means of transforming the education system can be noted in the progress of American educational system

In France Education Management Information System (EMIS) encompasses a broad range of educational data, including student information, teacher details, curriculum management, school infrastructure, administrative processes, and statistical analysis. The adoption of EMIS in France was intended to provide music education, information, and schooling for young musicians who require flexible organization to balance their education with intensive musical training. The system was introduced in the late 1990s in response to the needs of highly talented young musicians who required specialized training but also needed to complete their compulsory formal education. This system enabled such students to pursue their musical development while receiving appropriate academic support. (Law, Plomp 2003)

In the early 2000s, the Indian central government and various state governments acknowledged the importance of having a comprehensive education data management system in place. A few Indian states began piloting EMIS initiatives during this period, while others implemented it in later years. The difference has been brought about by the vastness of the land and the economic divide in the society, also the urban rural divide played a role in the ensuring digital divide (UNESCO 2008), infrastructure. Topography has played a role in determining

power connectivity and the internet access, hilly, mountainous and arid areas are likely face low connectivity

China was also an early adopter of EMIS, having implemented Information and Communication Technology (ICT) for educational purposes in the late 1990s. In 1996, the Chinese Ministry of Education established the "China Education and Research Network" (CERNET), which granted internet access to universities and research institutions Huang, x., Lin, z., & Zeng, m.t (2017). This move served as a cornerstone for the integration of ICT in education. In the early 2000, the Chinese government made it a priority to improve technology in schools. Its aim was to expand digital educational resources rather than digital text books. This is the vision of ministry of Education noted in the 2006 National Policy in conjunction with KICD in Kenya to scale up ICT use in education. The vision china had been to improve innovation and talent cultivation, enhance educational services and governance. (Shauxuan and Yun (2020) the first EMIS

Canada has made significant strides in using EMIS to enhance education management. Different provinces and territories within Canada have implemented their own systems; starting as early as 1990 these systems help in tracking student progress, managing resources, and evaluating educational outcomes.

Case study done in Alberta shows how collaboration with the industrial sector can help hasten the adoption of ICT in the education sector. There were established correspondence schools that relied on the slow and cumbersome

Canadian mailing system which was quickly replaced by ICT in the 1990s and led to the establishment of virtual schools as alternative schooling. The provision of targeted funds has placed Alberta at the pinnacle of success in the use of technology in education (Shade, Porter, and Sanchez 2005)

Implementation of EMIS in Africa is being fast tracked since it has proven to make access to online educational resources easier and simplified tracking of learner's progress and feedback. The countries that have fully digitized education would have a notable improvement of quality of education efficiency in data collection and effective teaching. E-learning can also reduce the cost of education by providing shared online resources

The Association for the Development of Education in Africa ADEA (2019) peer review revealed that Zimbabwe has fully implemented the EMIS system in their education management from ECDE to tertiary institutions. The system has been entrenched in law through the Education Act. A good methodological process has been established in line with the national and international standards. There is a huge leap in EMIS adoption and Zimbabwe is ahead of most countries in Africa. This has been brought about by incorporating ICT training in teachers colleges through College Information Technology Enhancement programme [CITEP] the training of teachers ensure sustained use of ICT in schools. In 2020 education budget in Zimbabwe was 13.1% of GDP Despite the low budget there are factors that have contributed to EMIS success as follows: political goodwill, availability

of EMIS budget from directorate of planning. Zimbabwe has census and statistic act that guide the coordination collecting and processing data, the education act that provides ministries of education the mandate to collect and process statistical data and periodical surveys conducted by government and partners. This scenario shows how the government supports assist to boost the uptake of ICT by institution of learning.

Teachers training and timely information to the primary implementers of EMIS helped in improving adoption and actual use. Proper policy guidelines and legislative support is visible in Zimbabwe's adoption of EMIS and despite donor funding the government still set aside a budget for its implementation. This shows complete government commitment and the results are seen on the success in implementation. Teacher training is an important component in the success of EMIS adoption in Zimbabwe creating ICT compliant colleges was a great stride.

Creation of ICT departments within the Ministry of Education provided both timely technical and material support to institutions of learning. Merging ICT to the educational needs of Zimbabwe made it to be accepted and readily used.

Developing countries like Kenya might have other pressing issues in the education sector such as laying basic classroom structures such that EMIS adoption and implementation has not been given the priority. The funding of EMIS infrastructure is costly and also requires a lot of resources for maintenances and sustenance. The funding of ICT use in Canada is a creative phenomenon that

struggling African countries can use to fund their own technology in schools, collaboration with the private sector could provide the much needed skill boost and funding that could otherwise be difficult to come by if the Implementation of EMIS has to depend on their government or donor funding alone. The idea of using technology for homeschooling could help the disadvantaged learners who have to trek long distances to school like the Kenyan Turkana child who drop out of school due to the long distance to school (Singoei 2015).

Funding educational infrastructure in Kenya can be bridged by the private sector in conjunction with the relevant authorities to ensure every child is included in the education journey. ICT could revolutionize the learning in arid and semi-arid areas, including far flung rural areas and bring them at par with the rest of the country According to Association for Development of Education in Africa (ADEA 2019). Political instability and fragile countries with a high number of refugees' compound challenges in producing data that is timely, accurate and comprehensive, it also leads to weak coordination and fragmented data. Kenya being a developing country with limited resources the intentional focus by the government of setting aside budget for its implementation will ensure that it becomes an achievable objective

EMIS was introduced to Kenya in 2008 and since then it has gone through changes, progress and growth albeit with challenges. The degree of utilization varies from one region to the other. Compared to its peers like Zimbabwe and

South Africa the thirteen years since the inception of EMIS has been painstakingly slow in Kenya (Kipsoi 2012). The government has made policies and guidelines but the use of ICT in learning and data management is still not at par. Simple placement of hardware and software in schools does not translate to use and adoption of EMIS (Jo Tondeur 2019).

EMIS just like other noble ideas faces various challenges due to ignorance, lack of skilled personnel and also infrastructural cost and limited resources. (Kanter (2012) some schools are so remote that they are yet to be connected to the national grid for power and poor or no internet connectivity. Lack of equity in school funding and nonexistent affirmative action has put strains on institutions that are based in economically challenged regions. The Kenyan education system is undergoing growth(statista (2023) and it requires the government to increase its commitment in funding and policy framework on the actualization of EMIS to fast track the transformation in information management system, technological change and innovation. The system is generally expensive and individual institutions cannot be depended on to bring about the desired results (Jiwak (2017) thus requiring government intervention and administrative support to ensure fast seamless transition.

EMIS system fits well to the new Competency Based Curriculum which is being rolled out in Kenyan education sector learners are encouraged to develop talents, life skills. Innovations and technical skills that will give them ability to earn a

living after their formal education (Ndungu 2021) this ability to work both soft skills and technical skills could easily be achieved through IT. The YouTube application can train on new skills that could otherwise not be available in the learners' locality. ICT could foster online teaching and reduce the challenge posed by teacher shortage

The cost of internet access is also silent hindering factor that affects EMIS utilization in Kenya. Government is yet to embark on ensuring improved affordable and reliable internet connectivity to learning institutions. Teachers and data managers are forced to use their own resources without any compensation (Kanyara. 2022).

2006 national ICT policy in Kenya works towards achieving knowledge based society, education is the key driver of attainment of this skills and knowledge, therefore in order to create dynamic and sustainable economic growth it should be given most important consideration (Mariga 2017). The government needs to follow through to ensure obstacles to adoption of EMIS are removed.

EMIS is necessarily time consuming given that quite often development of EMIS coincides with introduction of radical changes to the education system itself it is quite likely that requirement will themselves have changed by the time EMIS is implemented lovey(2010) Case at hand is the recent overhaul of education system in Kenya from 8-4-4 to Competency Based Curriculum (CBC).(UNESCO (2020) This means EMIS structure and type of data to be collected has to be

modified to accommodate the changes, this shall require new templates and probably change of applications and probably a complete overhaul of the hardware system. This might temporarily cause setbacks and requires the Ministry of Education to quickly streamline ICT to the new dispensation and funds availed to ensure smooth transition and training of the primary users

The study had been set up on a mission to find out the effect of covid-19 pandemic on the academic progress of the girl child in Nandi County. It looked like a simple task but the various Sub County offices did not have the data required to make informed conclusion, the ones available were fragmented and incoherent. Offices had one computer or two and the county had a statistics department .This brought forward the question as to why the records are not available. Is there a bigger issue other than hardware availability? Why EMIS is not fully utilized in Chesumei sub-county?

A number of studies have been done on determinants to EMIS adoption in different countries of the world and in Kenya but most of these studies concentrate on challenges, impact or use unique interaction between technology and institutional factors which makes it challenging to do comparison and make uniform conclusion on EMIS. Therefore, this study will factor the determinants of EMIS adoption in Chesumei Sub County Nandi County.

1.2 Statement of the problem

The Ministry of Education and its partners are supporting the use of EMIS in all secondary schools in Kenya; this is emphasized by the 2006 National ICT Strategy for Education and training. The last mile electric connectivity programme was a government effort to take electricity to all rural schools however many schools in Nandi county especially chesumei sub county have lagged behind in adoption of EMIS this has been noted through delayed educational data transmissions and correspondence Ministry of Education (MOE). The study therefore investigated the determinants of EMIS adoption in secondary schools in Chesumei Sub County.

1.3Purpose of the study

The purpose of the study was to investigate the determinants of EMIS adoption in secondary schools in Chesumei Sub-county.

1.4 Objectives of the study

1. Establish the availability of centralized data management system in secondary schools of Chesumei Sub-county.
2. To determine the level of principals' knowledge and skill in using ICT for EMIS in secondary schools of Chesumei Sub-county.
3. Establish the Ministry of Education support on the adoption of EMIS on data management in secondary schools of Chesumei Sub-county.

4. To find out availability of EMIS infrastructure in secondary schools of Chesumei Sub County.

1.5 Research questions:

1. How have the secondary schools of Chesumei Sub County adopted centralized data management system?
2. What are the level of principals' knowledge and skill in ICT for data management in secondary schools in Chesumei Sub-county?
3. How does the Ministry of Education support the implementation of EMIS Data management in secondary schools of Chesumei Sub-county?
4. What Education Management Information System infrastructure is available in secondary schools of Chesumei Sub County?

1.6 Significance of the study

This study will be helpful to the Ministry of Education and other stakeholders on understanding the determinants of adoption of EMIS in secondary schools. The findings will help the policy makers and education planners on how secondary schools can adopt EMIS. The findings of this study will contribute to the advancement of knowledge on the determinants of adoption of EMIS in secondary schools. The findings shall also help researchers, trainers and trainees in implementing EMIS.

1.7 Limitations of the study

The distance between schools might hinder faster collection of data and increase expenditure on travels. This shall be mitigated by research assistants and use of technology to help capture data.

Some schools will be doing exams however research schedule shall be done before or after exams.

1.8 Delimitations of the study.

The study intended to discover determinants to adoption of EMIS.The study included the principals, deputy principals, and ICT teachers and sub county director of education. The study covered EMIS skills of the school principals, administrative support, Centralization of data management and availability of EMIS infrastructure. This research was confined to secondary schools of Chesumei Sub County.

1.9 Assumption of this study

That EMIS is the integral part of the education system and schools use it in management of data and information generation for decision making.

Another assumption is that the principals and their deputies will be positive and give credible and reliable feedback that will allow the study to have a clear picture on the challenges of EMIS

Third assumption is that the respondents will be available at the time when the interviews and questionnaires are administered.

The principals and deputies are trained and have skills in using EMIS for data management.

1.10 Definition of key terms

Determinants refers to factors that affects adoption of EMIS

Infrastructure refers to components necessary for EMIS implementation

Skills refers to computer and digital literacy that enhance adoption of EMIS

Data management refers to use of ICT to collect, use and store information

1.11 Organization of the study

This study was dealing with the determinants of adoption of EMIS in secondary schools in chesumei Sub County.

Chapter one is introduction to the study, statement of the research problem, purpose of the study, objective of the study, research questions, significance of the study, limitation and delimitation of the study, basic assumption definition of significant terms.

Chapter two covers literature review, introduction ,literature review on dependent and independent variables ,literature review based on objectives, conceptual framework. Summary of the literature review

Chapter three shall cover research method ,introduction, research design ,target population sample procedure and sample size ,data collection instruments, instrument validity, instrument viability, data collection procedure, data analysis techniques, ethical consideration and references.

Chapter four, data analysis, data presentation interpretation and discussion, introduction, demographic characteristics, data presentation interpretation and discussion on study objectives, result on objective one, two, three and four.

Chapter five conclusions and recommendation, introduction, summary of findings, conclusion recommendation

CHAPTER TWO

REVIEW OF LITERATURE

2.1. INTRODUCTION

This chapter reviews literature of similar studies done by scholars all over the world. It focused on the four objectives of the study i.e. centralized data management system, level of principals' knowledge and ICT skills, government administrative support and availability of EMIS infrastructure in schools

The implementation of EMIS in education has been driven by the increasing availability of educational data and the need for data-informed decision-making. Schools and educational institutions generate vast amounts of data related to student performance, attendance, behavior, and curriculum planning. EMIS enables the collection, organization, and analysis of this data, thus providing educators and administrators with valuable insights to improve instructional practices, student support, and overall educational outcomes (Husein 2017). This literature review aimed to explore the current research and identify the benefits, challenges, and potential risks associated with the implementation and utilization of EMIS in education.

By critically analyzing studies, reports, and scholarly articles, the study have examined the various dimensions of EMIS in education, focusing on the key themes and topics, The research done on factors affecting continuance adoption of e-learning by instructors in Malaysian higher education institutions concluded that

demand of the market and perceived usefulness are two key factors that limit the adoption of e-learning by instructors in Malaysian higher education institutions (Nordin, Ramalingam, Norazmi 2021).

Principals ICT skills was investigated in relation to administrative processes, resource allocation, and operational efficiency in educational institutions. The study did focus attention on how Communication and collaboration has been effected through EMIS platforms among teachers, students, parents, and administrators. The study examined how government support or lack of it has affected EMIS, impacting its utility and adoption.

Centralized Data management system Research did focus on how EMIS impact data accessibility and sharing across different departments and platforms in an education system while maintaining data privacy and security, The review of literature discussed and analyzed the impact of availability of ICT infrastructure on utilizing of EMIS in curriculum implementation and learning, specifically in relation to communication, time tabling and financial management. Integrating EMIS into educational environments and promoting data-informed decision-making in the education sector also to provide comprehensive comparison and similarities to the current state of adoption of EMIS secondary schools of chesumei sub county Nandi, Kenya. The findings will inform educators, policy makers and educational decision makers and will guide in future research on similar subjects.

2.2 Availability and Efficiency of Centralized Data Management System

This review of literature covers the availability of Centralized data management system in educational institution and how it has affected school level data management. The centralized data management system is the storage of data in single location such as single central processing unit or mainframe computer and is managed as a single unit, ownership is within the centralized data team, it integrate all data into a single shareable source, it provides data source within the school and the separate level of educational management data in the system could include; student records, attendance register, grades and assessment records. The centralized system integrate and consolidate data from various sources, it should be flexible and be customized to unique needs of individual institution and also serve national purpose.

The application of Educational Management Information Systems in American education traces back to its early adoption for student information management. With the introduction of computer systems and databases, educational institutions were prompted to explore electronic methods of storing and organizing student records. This transition from manual record-keeping to EMIS not only enhanced operational efficiency but also contributed towards improved data accuracy and accessibility. Moreover, as technology advanced over time, EMIS expanded its functionalities to encompass a broader range of administrative tasks within the field of education. (US department of education 2017), the transformation of

school data management in America has been undeniable due to the rapid advancements in technology.

With the implementation of digital systems and software, educational institutions have experienced a significant shift in the way they collect, analyze, and utilize data. This transformation has not only streamlined administrative processes but has also resulted in improved efficiency and accuracy in managing student information (Cindy long 2015). One of the key benefits of technology in school data management is the ability to access, store, and retrieve information more efficiently.

A study done in Milwaukee public school highlighted the following challenges to the full implementation of EMIS in the American schools. The data entry became a challenge as tutors realized that data do not magically appear, ready-made there arose need to set up the system and skilled people to key in data. They struggled to build the internal endurance, range, and create order to make data work for the institutions. They have had to master skills on how to collect data, how to structure it, how to construct good questions for the data clarity, how to precisely analyze data, and how to apply data results appropriately and ethically. Despite their advancement and favorable outcomes, the school teams concluded that by the end of the project they still needed to learn how to incorporate data seamlessly into their everyday operations and how to build their capacity to use data for

decision-making in their institution and at various layers of education management. (Mason 2015)

Research done on the effect of remote learning during the covid-19 pandemic on young children learning and academic behavior in Georgia found that administration of data to decision making presented a range of convoluted challenges for administrators. Most school administrators and parents reported decline in student learning and academic behavior related to online learning. Lack of Wi-Fi became an issue, hard to use technology, and digital literacy was often cited as barriers to remote learning. These barriers to remote learning were amplified for students and parents of vulnerable groups' (klosky, Gazmararian, Casimir, Blake 2022).

The management of student data in China's universities has been significantly impacted by advancements in technology. The era of big data has made it more convenient and easier to manage university education (Zhao, 2022). However, this era also presents several challenges to the management of universities. One of the challenges is the potential loss of information when it is saved and being transmitted. The implementation of internet of things (IoT) wireless network technology in China's universities has facilitated real time collaboration and correspondence between all education players, in additions, IoT technology offers avenues for higher learning institutions of china to improve their data management systems. The use of IoT wireless network technology by the

universities allows the institution to be able to track student attendance, monitor their performance, and provide personalized learning experiences.

In Italy, the process of digitizing education administration and data management began in the late 1990s and the early 2000 (Callegari 2022). This involved the introduction of electronic systems to streamline administrative processes and improve data collection and reporting in schools and other educational institutions. One significant milestone in this regard was the launch of the "Anagrafe Nationale Studenti" (National Student Registry) in 2001 European commission country report Italy (2017). The National Student Registry aimed to centralize student data and provide a standardized system for managing student enrollment, transfers, and other administrative tasks at the national level.

Despite the perceived success budgetary allocation is not yet sufficient for it robust implementation. (Avvisati, F.Hennessy, Robert 2019) According to World Bank report of 2001, the introduction of EMIS to Afghanistan education system revolutionized learning and educational transition. Afghanistan is a country that has been ravaged by war that has been compounded by its rugged terrain! War ravaged schools made it worse for the girl child to access education. EMIS came in handy and provided Solutions that would otherwise be insurmountable with the above stated background.

The World Bank piloting of EMIS in the year 2001 accordingly revolutionized education especially in URUZGAN province that was quite inaccessible. EMIS

has morphed into a centralized portal where learners' information can be accessed at a click of a button. Government collects data in far flung areas and keeps track of learners' progress. It has improved planning, funding and policy making. Parents with little education are able to participate in their children's education by using simple gadgets like phones. The centralized system was made user-friendly ensuring the learners, parents and other education players could fully utilize the system without feeling intimidated by the complexities and hard systems.

This empowered entire communities to participate and embrace education. Initially students' certification took three years or more but it has been reduced to three months, this has brought confidence to the system and enabled learners progress through stages of learning without much hindrance and prolonged waiting (World Bank (2001). The Kenyan government through the introduction of National Education Management Information System (NEMIS) has attempted to provide centralized management of learners nationally and also provide platform for more data driven school funding (MOE).

The introduction of NEMIS in Kenyan schools since 2017 was aimed to address various challenges in the education sector, including data management, monitoring learners' progress, and planning. The implementation of EMIS has potential to reduce or eradicate corruption, cheating in examination and mutilation of academic documents. Notwithstanding this positive outlook Kenya still have a monumental challenge in centralization of data management system in school due

to the fact that a lot of Data is still in fragmented form. The school managers and county directors still get school information and data forwarded in the form of Whatsapp or phone messages.

Government agencies like Kenya national exam council, the ministry of education, and other examination bodies belonging to different institutions, colleges and universities run separate systems of certification therefore students credentials is yet to be merged into one centralized system. This is cascaded down to the school level where information management system is fragmented and not run from a central point. Some of the factors that could contribute to such scenario are infrastructural challenges and other inadequacies that require urgent address through deliberate funding and conclusive policy framework by the government.

Centralized data require budget both for installing and maintaining the system which requires balancing with the expected benefits. The centralized system can generate valuable information for both planning and decision making at the institutional level, the middle levels of education management and the National level. The Ministry of Education in conjunction with Kenya national examination council (KNEC) have introduced a permanent learner assessment number that will enable the government to track the progress of pupils from grade three to the tertiary level(KICD). This came to support the introduction of competency based curriculum (CBC).

This is intended to gather learner's data and progress through the academic life, it will also bring accountability in student funding. Despite this being a notable move teething challenges have emerged that requires consistent attention of the educational management this includes the inability of the schools to run the ICT systems. Cyber cafes across chesumei are busy keying in school data on behalf of the principals. There is noted delay in data transmission and occasional loss of data that have caused students to miss on their national exam because they were not registered or their details were not correctly keyed in. (MOE) .using cyber cafes to send students' data might cause a breach in the data law.

The Kenyan data protection law was introduced in 2019, this law was intended to safeguard potential misuse and loss of data captured in local IT system (data protection act 2019) .NEMIS has improved school infrastructure fund allocation by providing a web-based data management solution that collects data and information from education institutions, processes and reports the status of designed indicators, it also provides the sector a solid ground for effective management to ensure that every learner counts (MOE), the ministry of education used NEMIS to validate and verify data profile of all public schools in the country to measure their capacities to host junior secondary schools (MOE).

The centralized data management has proofed to have positive outcomes though it suffers implementation challenges like difficulty of use by the principals, lack of internet connectivity, System delays and wrong information being uploaded

(Beja, 2019)Waweru (Nov 2016) conducted a study on the assessment of education management information system in Kiambu Kenya, the study concluded that there was need for improvement in the component of technological infrastructure and computer literacy skills to improve adoption and functionality of EMIS.

the covid-19 pandemic led to complete schools closure in chesumei sub-county no learning took place in any form whatsoever, the schools could not launch remote learning due to a myriads of factors possibly lack of ICT infrastructure, lack of technological skills of both the teachers and parents challenge of getting online study materials and the organizational skills to run the system effectively.

2.3 Level of Principals' Knowledge and Skills in using ICT.

Basically, it is becoming increasingly relevant for principals to be knowledgeable in information and communication technology (ICT) in today's digital age. ICT skills enable principals to effectively steer and exploit the potential of technology in their educational institutions. ICT expertise allows principals to integrate technology into various facets of school administration, curriculum development and instructional exercise. The mandate of the principals include organizing school curriculum that includes instructions and learning experiences, administrative tasks that include finance management and control ,human resource management secretary to the school board and maintenance of school buildings tools and equipment (TSC 2007)

This positioning of the principals gives them a powerful edge to promote digital literacy among students and staff and the community at large. The ministry of education in Kenya realized this leverage position and introduced the ICT strategy (MOE 2006) it guided on training of principals on relevant technology for educational management. School leaders with ICT skills can make enlightened choices regarding technological input infrastructure development, and digital resource appropriation and effectively connect and collaborate with different stakeholders, including teachers, students, parents and community members.

A study done on principles of Palermo Italy to measure principal's support for ICT integration (Cash 2011)The intention to use any technological innovation is influenced by two things perceived ease of use and the perceived usefulness Davis .F.(1989) the results of the study showed that principal support for ICT was associated with their attendance to ICT training course.it was consistent with Serhans (2007) research that technology training for school leadership is able to foster principals positive attitude towards the introduction of ICT in the classroom, it also showed the amount of ICT equipment available and teachers ICT skill and frequency of use was the biggest influence on principals supportive behavior

The extent to which teachers and principals in Italy are ICT compliant can vary depending on several factors, including the teacher's age, experience, training and the resources available at their schools. Some teachers may be highly proficient in

using ICT tools and integrating technology into their teaching methods, while others may require further training and support. The study done on principles of Palermo indicated that there was initial resistance by the principals as they feared that technology was taking over their responsibilities and their job. Their lack of ICT skills created technology phobia that was also a notable hindering factor.

Studies done in Tanzania on implementation of EMIS and ICT use in schools and institutions repeatedly show the low or lack of IT skills on the teachers as one of the major factors that contributes to poor uptake. Secondary schools still rely on manual systems (Sedoyeka & Gafufen 2016) the failure is also attributed to insufficient ICT infrastructure in secondary schools (Swarts & Wachira 2010) the cost of EMIS ownership is beyond the reach of most schools in Tanzania. This has reduced schools to continue the use of the archaic means to correspond with parents by letters (Kayombe 2017).

Tanzanian government cannot have teacher accountability nor keep proper details of learner's progress unless it invests in ICT use in school. The little work done Through EMIS is unreliable due to lack of competently skilled personnel to run the system. (Luena 2012) Cross check of statistics held by the ministry of education shows erratic and fragmented data which does not have consistency in numbers and records. Study done by (Kihoza, Zlotnikova, Bada, and Kalegele 2016) indicated that a high number of tutors are on the basic knowledge of computers and this might have contributed to the low usage of ICT learning

institutions. EMIS, like free education, needs to be entrenched in educational laws and the political class be convinced to see the potential of EMIS in education management.

A fully fledged department for technology should be created and be adequately funded to drive greater adoption of EMIS(S Ghavifekr (2014). Issues that have contributed to low adoption of EMIS in academic in Tanzania, according to research done by (Nkata, Arnold & Dida, and Ally 2020) range from lack of ICT infrastructure, the cost of ownership of EMIS and challenges of getting skilled IT technical support. It recommended that all ICT system should be domesticated. Roll out should include backup technical support and maintenance crew that will ensure the system is always working. Little or no allocation of budget works to destabilize EMIS adoption and technical support. Funding and focused sustenance of ICT could potentially revolutionize education management systems and put the country's EMIS in the international standards. EMIS,

Principals are the gatekeepers of their institutions and their attitude and perception influence the whole functionality of the institution. The training of teachers on adoption and use of ICT in most developing countries has not been appropriate according to (Makhanu (2010). The curriculum used to train teachers in the developing world might not be suitable if it is copied directly from the first world countries since the technology available does not fit nor has low sustainability; it

also doesn't fit the social and organizational aspect of the institution. Some programs could be archaic and has been overtaken by new inventions.

No two countries have similar education system hence the templates should be design to fit the system and continuous upgrade be done according to emerging technology. Teacher's skills should continuously be updated too. Technology requires continuous skill and curriculum upgrade. Studies done in Tanzania on implementation of EMIS and ICT use in schools and institutions repeatedly show the low or lack of IT skills on the teachers as one of the major factors that contributes to poor EMIS implementation. Other factor is over dependents on external sponsors and skills from the expatriates that a time might be too little not fit to the local system.

Data and management in school is like the famous chicken and egg story: none can fully function nor succeed without the other and none is greater. The world is going global and no country should be left behind There has been effort made by the TSC Kenya and the ministry of Education to train principals and teachers on the use of ICT though insufficient due to time and cost constrain it is one of the means for improving adoption of EMIS in institutions. Kenya's journey towards digitization has not been without challenges but the strides are commendable. Some chaptersof the country suffer insecurity, banditry and nomadic lifestyle due to drought. This situation underpins the importance of digitizing education to help secure the learners who would otherwise drop from school.

The government has improved on power connectivity through the last mile project (KPLC) and internet connectivity by laying fiber optic (Ministry of ICT) and KICD has been at the forefront in developing digital content by creating digital cloud (KICD ACT 2013). The recent covid-19 pandemic has brought to the fore the importance of digitizing schools and fast tracked the internet development in the country. The new education system [CBC] has rooted learning of ICT content at the core of the Curriculum. This has greatly improved the use of ICT in teaching and for learner management and e-learning

Teachers' service commission has been at the forefront in using computerized systems to manage teachers and has done targeted training to improve teacher's digital literacy. Recently the teacher's service commission introduced the training of school teachers known as ICT champions and principles of both primary and secondary schools (TSC).

The introduction of the TPAD tool is such a commendable shift in teacher management, it has encouraged use of ICT in routine reporting by the teachers and is definitely going to boost familiarity with ICT and reduce technology phobia [curriculum guide for ICT integration in education] but more needs to be done to ensure full digitization of the education system.

2.4 Ministry of Education Support on the Adoption of EMIS on Data Management System

This review of literature intended to establish the role government administrative support played in EMIS implementation and use. There are different levels of educational administration beginning at the school level management board, county education board and the ministry of education. These different levels of administration play a vital role in the success of the school system and programs. The government plays a central role in the adoption and implementing of EMIS in schools, it does that by formulating policies and necessary guidelines to promote uniform country wide implementation of its programs including adoption of EMIS.

It defines strategies, standards, and purpose for data collection and reporting within the education system, it provides guidelines on ethical use and security of data and information. Studies concludes that variety of factors such as availability of resources, capacity to use technology, opportunities and availability of time, and technical support could influence EMIS use in schools (Nyakwara 2014).The financial allocation provides necessary resources and infrastructure to ease in EMIS adoption. Educational data could also be integrated with other data system within the education sector linking EMIS with other government database for comprehensive analysis and reporting. (UNESCO 2008)

China is one of the countries that have prioritized improving ICT infrastructure in public basic schools and tertiary institutions. From 1988 china has had projects such Rural Elementary and Secondary School Distance Education Project that was intended to play a leading role in integrating ICT in basic level of learning (MOE China).According to (Wenting Zeng 2022) china have had 179 policy documents between 1988 to 2021 which can be grouped into three phases, this include for innovation of teaching, construction of ICT infrastructure and cultivation of ICT competencies.

Chinas Education scale is huge with 198million primary and secondary school learners and over 13million teachers in 2020 (Wenting 2021) and with the localized basic education financing system, thus it brings about lots of differences in social and economic development depending on regions and settings, big gaps exist on the educational quality between the rural and urban setting (li & Yang 2013)

The Chinese national progress of technology and development resonates with integration of ICT in Education while the national policy makes macro planning the global technology advances contributes constantly to iteration and innovation (Hu 2019).After the construction of ICT infrastructure and training of personnel china started putting more emphasis on Designing platforms for public schools and services (Jiao 2014). During covid-19 epidemic digital facilities assisted a lot in curriculum coverage and student's personal online learning (Dong 2021)

Governments carry out monitoring and evaluation on EMIS systems and its implementation to ensure compliance and effectiveness with existing policies, it does an assessment on the system impact on educational outcomes and identifies areas that require improvement and rectification. The government collaborates with international partners, development agencies, and educational institution to leverage on their expertise and resource in implementing EMIS (Luena (2012).

Despite this, governments in majority of African countries have not necessarily been successful in adoption of EMIS. Countries face fiscal challenges and lack of human resource to develop and maintain EMIS system, insufficient training programs and limited availability of skilled professional can pose an important challenge in the implementation of EMIS.The success of EMIS require cooperation and collaboration of various stakeholders and government administrative support is very important in the implementation of any new idea and innovations.

Government input is in creating awareness and training of end users, allocating resources for procurement of hardware and software While many governments recognizes the importance of information communication technology, challenges persist that may hinder effective implementation of EMIS initiatives, this is particularly true for developing countries. Consequently, these challenges can impact the success rate in providing educational services through digital platforms.

Most institutions in Nigeria still do instructional and administrative work manually; the adoption of EMIS is still very low students still have difficulties getting certification and transcripts. This has affected the employment sector since it's difficult for qualifications of employees to be verified. Traditional data record has been marred with personnel malpractice including mutilation of vital academic records (Onah 2016). EMIS cannot be implemented successfully without government involvement. Considering the cost of ICT infrastructure is too prohibitive to be left to parents and school boards alone.

To have a national centralized system of data management policy and planning has to be done by the government. Laws have to be formulated to guide on the use and security of data. Departments have to be conceived to run and maintain the systems. According to (Taiwo and okwor (2021) student's records in Nigeria are at the mercy of individual schools and can easily be tampered with. Nigeria being one of the large economies in Africa and has one of the largest populations in Africa it goes without saying that it has a large student population. With this background the seriousness and urgency of some form of data management cannot be over emphasized. It has to be noted that Nigeria set aside a very low budget for education in the year 2020 at 6.7% compared to Namibia's 23% and Kenya's 26.7%.

This is below the internationally recommended benchmark (UNICEF 2022). Nigeria is one country that is leading in technology spending (international trade

2023) therefore the government need to focus on data management in educational institutions. This could potentially save the millions of children currently out of school in that country. According to (UNICEF 2022)10.5 million children are out of school in Nigeria. Considering the massive availability of technology in the country, the government should create a policy framework that will guide the education ministry in EMIS adoption. Factoring in the high cost of EMIS infrastructure it cannot be gain said that funding from the federal government is essential.

The Association for the Development of Education in Africa (ADEA 2019) peer review revealed that Zimbabwe has fully implemented the EMIS system in their education management system from ECDE to tertiary institutions. The success of EMIS in Zimbabwe can be attributed to the fact that the system has been entrenched in law through the education ACT 2016). A good methodological process has been established in line with the national and international standards. There is a huge leap in EMIS adoption in Zimbabwe it is ahead of most countries in Africa this has been brought about by inculcating ICT training into the teachers training colleges through college information technology enhancement programme [CITEP] the training of teachers ensure sustained adoption and use of ICT in schools.

In 2020 education budget in Zimbabwe was 13.1% of GDP (UNICEF 2021). Despite the low budget there are other factors that have contributed to EMIS

adoption and success as follow; political goodwill and availability of EMIS budget from directorate of planning, The country has census and statistic ACT (2007) this guided the coordination collecting and processing of data, the government of Zimbabwe formulation of ICT in education policy (2016) that made recommendations for the advancement of ICT in education including for pedagogical use, for Teachers training and timely dissemination of information to the primary implementers of EMIS helped in improving adoption and actual use of EMIS.

Proper policy guidelines and legislative support is visible in Zimbabwe's adoption of EMIS and despite depending on donor funding the government still set aside a budget for its implementation. The one child one laptop rolled out by the Kenyan government in 2013 had appointed Moi University and Jomo Kenyatta university as manufacturers and technical support but low funding ,lack of trained teacher and poor accountability largely made it to fail and led to the project being suspended in 2019(Wanjala 2022). No legal framework was put in place to guide on data management and development. This could only emphasize the importance of proper structure for implementation, proper policy framework to guide in rolling out ICT programs and right laws put in place to support EMIS system

2.5 Availability of Education Information Management System Infrastructure in Secondary Schools

ICT infrastructure means the equipment required to handle information data and communication system for example hardware like computers, electricity, software applications, the internet connectivity, operating systems and data storage (Pernia 2008) Infrastructure plays a critical role in the adoption of Education Management Information System (EMIS) in education for several reasons: Successful implementation of an EMIS requires a robust technical infrastructure including sufficient computers, servers and reliable internet connectivity, Technical Support & Maintenance of Infrastructure and also providing regular system updates and system maintenance and adoption of new innovations. These are crucial to ensure its use is efficient and effective.

Human Resource means Adequate training for staff who will use the EMIS system in the institution .When users do not understand how to use or do not see the benefits of the system, they may resist its adoption, according to the theory of diffusion of innovation (Rogers 1962).Policy and Legal aspect of the Infrastructure especially software ownership and use, supportive policy environment that understands and promotes the use of EMIS is truly vital for its adoption and acceptance. The legal aspect includes data privacy and security regulations that ensure student information is appropriately protected, Intellectual property and internet safety. Policies provide roadmap of actions to be pursued

The Ministry of Education has not fully established the role of ICT in Kenyan schools therefore schools don't have clear goals on how to support technology integrations (Jo Tondeur 2019) infrastructure have significant influence on readiness to adopt EMIS (Mulwa 2011) Minimal government support through insufficient budgetary allocation leads to over dependent on donated equipment which mostly is old and not able to run modern applications technology (Ugwude &Ugwude 2020). Sustenance of ICT infrastructure overtime is expensive. Technology evolves quickly and poorly funded schools might find it untenable to keep upgrading the system.

Sources of funding should be streamlined to ensure changes are fully and quickly integrated .the possible reason for slow infrastructure installation and use is lack awareness of latest EMIS applications and innovations. The low adoption of EMIS for academic progress in Tanzania according to research done by (Nkata, Arnold & Dida, Ally 2020) range from lack of ICT infrastructure, the cost of ownership of EMIS, challenge finding IT technical support, little or no allocation of budget, no legal framework to guide on data management and poor economic situation in the country. It was noted that over dependent on external sponsors and skills from the expatriates' has made technology foreign and not readily accepted.

A study done on challenges of EMIS implementation in developing countries noted the following as challenges of EMIS use and expansion, poor Database security, lack of information sharing, lack of adequate information, slow data

dissemination process, delays in planning and decision making at a management level, poor internet adaptability and accessibility, low budget for the ICT infrastructure (Bhatti and Adnan 2010).

There is a possible disconnect of data sharing information and storage between the schools, Sub county headquarters and the ministry of education. There is no visible structure put in place for data storage and correspondence between individual schools and county education management A study done in Nigeria Nsukka local government of Enugu on challenge of EMIS on primary school administration shows that lack of technical support, inadequate user friendly software, lack of ICT support center, lack of training in data analysis skills as factors hindering ICT integration in class (Ugwude &Ugwude 2020).

On barriers to adoption of e-learning in Kenya (World Bank 2007) shows lack of a model to guide for e-learning adoption. It also noted the institution size as a determinate to adoption of EMIS. Small institutions lack the resources that larger institutions can easily afford to install the infrastructure needed for adoption of EMIS. In 2006 the national policy on ICT strategy for education and training was formulated this dealt with ICT education policy on; Digital equipment, connectivity and network infrastructure, access and equity, teaching support and maintenance, harnessing emerging technologies, integration of ICT in education (MOE) although this is a positive move for the provision funds for ICT

infrastructure and internet connectivity the implementation of the policy is still not satisfactory.

The Kenya education sector support program [KESSP] identified ICT and e-learning as priority area in education improvement. The policies are good and visionary the government needs to put more intentional support in terms of materials and funding

2.6 Summary of literature review

The reviewed literature on the determinants of adoption of EMIS for centralized data in secondary schools indicates importance of EMIS in management of education. From the literature reviewed the following gaps were identified, effects of administration on EMIS implementation and how ICT skills of school administrators influence adoption of EMIS in school . Case study done on Afghanistan shows that full implementation and use of EMIS can transform an educational system even in a place that is seen as difficult and has conflict. ICT can transcend difficult terrain and hostilities and bring education to individual households.

The Canadian Alberta study also supports the fact that ICT can be the greatest equalizer and provide flexibility that otherwise could not be achieved using the manual form of education. The collaboration by the private sector can boost the much needed funding for the adoption of EMIS in schools. Nigeria and Tanzania have highlighted the challenges EMIS faces when there is no political goodwill,

supportive laws and policy to guide on EMIS implementation. The overdependence on donors to run ICT by the two countries has had a slowing effect on its adoption.

Zimbabwe could be an African case study on how supporting EMIS politically and legally and having vibrant policies on its implementation can hasten the process and transform the education system. Training of the primary end user has been highlighted as one of the pillars to full integration of technology in school, this shows that there are different factors and determinants at play in the success or failure of EMIS adoption in schools, these factors require to be addressed fully to have a success in ICT adoption. Education officials play a crucial role in adopting Education Management Information Systems (EMIS) in education. Here are some ways in which they can contribute to the successful implementation of EMIS. Education officials can advocate for the adoption of EMIS at all levels, including government, policymakers, and educational institutions.

They can demonstrate leadership skills by emphasizing the benefits of EMIS, such as improved data management, improved decision-making, and increased accountability. The officials can develop policies and guidelines to promote the integration of EMIS into the education system. These policies should address issues of data collection, data quality assurance, privacy and security, data sharing and data analysis. Clear institutional level guidelines can provide a framework for schools and counties to follow when implementing EMIS. Education officials can

allocate resources, including funding, technology infrastructure, and training, to support the implementation of EMIS.

They should ensure that schools and counties have the necessary resources to acquire and maintain the hardware, software, and connectivity required for EMIS. Education officials can organize training programs and workshops to build the capacity of teachers, administrators, and other stakeholders involved in EMIS implementation. Training could cover all aspects of data entry, data analysis, reporting and decision making using EMIS. Continuous professional ICT skill development can help educators feel confident and competent in using EMIS effectively. Education officials should establish mechanisms to monitor and evaluate the implementation and effectiveness of EMIS.

This includes regularly evaluating the quality of data collected, identifying challenges or bottlenecks, and providing ongoing support to schools and districts. Monitoring and evaluation can help identify areas for improvement and guide future decision-making. Education officials can collaborate with important stakeholders, including technology providers, researchers, and international organizations, these organizations can help them utilize their resources and expertise. Cooperative efforts can facilitate the design and implementation of EMIS solutions that are in line with the best practices and specifically tailored to the local needs.

Education officials can explain the benefits of EMIS to various participants, including teachers, parents, and the general public. They must increase awareness of how EMIS can enhance educational quality and promote transparency and accountability. Effective communication can promote a positive environment for the adoption of EMIS in the education system and encourage support from all parties involved. By fulfilling these roles, education officials can facilitate the successful adoption and integration of EMIS into the educational system, which will lead to an increase in data-based decision making and to better educational results.

2.7 Theoretical framework.

A theoretical framework is a set of concepts, ideas, and assumptions that provide a way to understand and organize a phenomenon or a research problem. It is an essential part of any research study as it helps the researcher to connect their study to existing knowledge in the field and provides a framework for interpreting the results. The theoretical framework guides the research questions, the selection of data collection methods, and the analysis of data. It also helps to identify gaps in the existing knowledge and suggests ways to expand or refine the theory. This study shall employ the theory of diffusion of innovation (Rogers (1962).

The theory states that there are five stages of adoption of technology, the awareness, persuasion, decision, implementation and continuation. Does the society know of the presence of the new technology? Is it visible in the market?

Do the users feel persuaded to the advantages of the new technology over the previous one and are they encouraged to use? The cost of implementation eases of use and the continued use and maintenance of the technology. This theory is important to the study as it explains how new ideas are adopted and absorbed into society. The Level of flexibility and embrace of new technology depends on personalities and way of perceiving things.

This theory can be used best to explain the different developmental stages of EMIS in institution despite operating in the same jurisdiction and having a common start in the introductory stage. The four groups can be easily identified in the new technology of EMIS these are the;

Early adopters-These are people who are quick to adopt new innovation and its utility in society. This explains the lack of parity in EMIS adoption in different schools across the country. Some schools embraced the technology quickly and made it part of their school management and learning. This has led the institutions to be more advanced in technology use.

Early majority-These are the group who open the way for technology use in the wider society and general population. This when EMIS technology is being accepted as an integral part of data management in Majority of schools who have partially of fully adopted EMIS

Laggards-These are people who have their own set ways of doing things and are risk averse mainstreaming the technology forces them to eventually adopt and use

it.Some schools management believe their old way of doing things is good and do not see the need for change or bringing in complicated systems that they might not be enthusiastic to learn. This has led to some schools completely avoiding integrating technology in data management

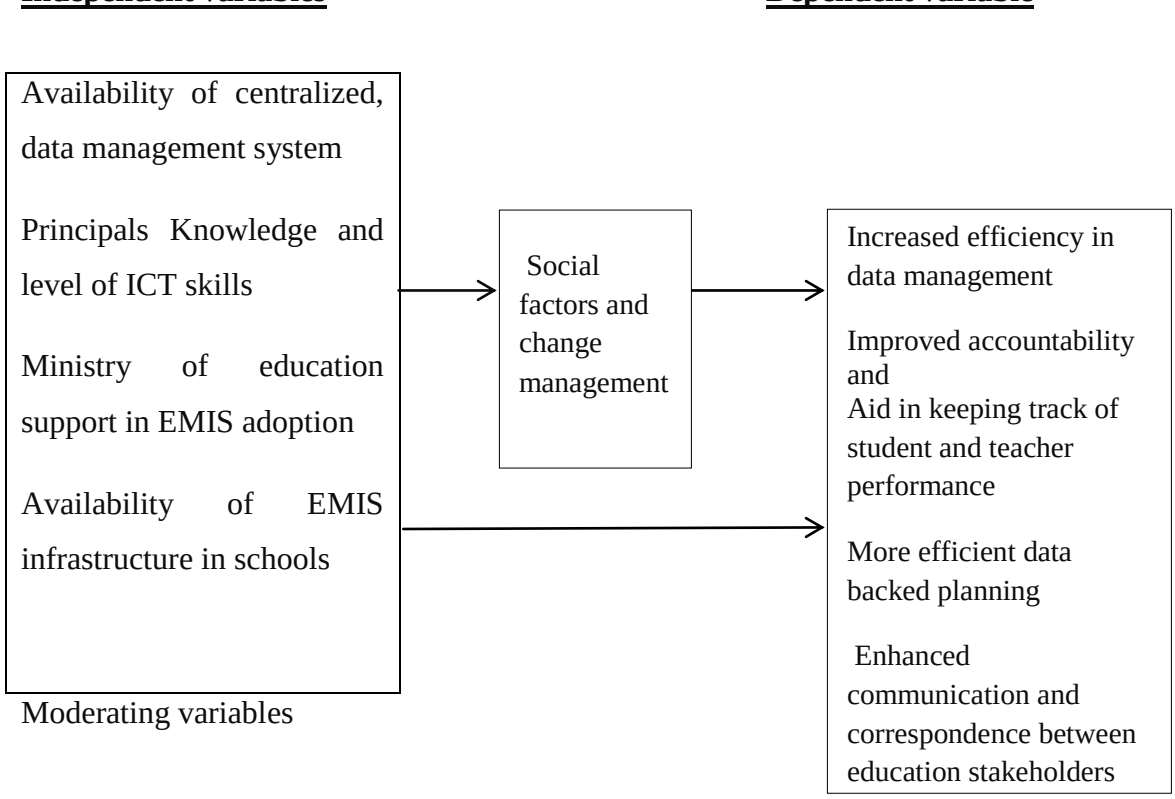
Late majority-This group follows the early majority to adopting of technology after realizing the usability and efficiency of technology and interacting with it.They adopt the technology in school data management

EMIS is a comprehensive system that brings together technology people and processes (UNESCO 2008) EMIS is highly dependent on technology, skilled personnel to run its administrative support to provide policy and guidelines and financial support for building of infrastructure and other supportive applications. EMIS is useful and productive when it has highly trained people that can gather accurate and timely information and convert it into useful data that can be used in decision making and policy. The input determines the output. The primary handlers of data are essential so much so that they cannot be taken for granted.

The technology used should be reliable and be suitable for the task intended for the processes of data collection and transmission should support in building the accuracy and reliability of the Outcome. The three factors, skills, technology and processes are completely interdependent failure of one will lead to failure of the rest. If any of the three is missing then the development, efficiency and effectiveness of EMIS is greatly compromised(Bernbaum 2011)For the above

three pillars to work, administrative support needs to be enhanced to ensure effective training funding of ICT infrastructure and creation of policy framework to enable conducive operational environment and a functional Education Management systems

2.8 Conceptual framework



The concepts above further describe the influence of the administration; this is the government policy framework, financing and general input of dependable ICT infrastructure. An ICT skill of the implementers of EMIS principals and teachers is vital to full utilization of EMIS in institutions. The social perception and acceptance of EMIS determine the pace and commitment of full utilization of

EMIS. The economic factor is also a key factor. The availability of funds to acquire hardware and software, improves sustenance of EMIS adoption.

Each of the factors depends on each other and the relationship between the factors is strong such that one or two factors alone cannot fully sustain the full implementation and realization of EMIS and therefore a correct balance of each component under each factor has to be attained. (Deek.F & McHugh 2007)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The research methodology for this study is outlined in this chapter. This chapter contains the following sub topics, research design, target population data collection procedure and instruments to be used in the study, validity, reliability of instruments and data analysis.

3.2 Research design

Research design refers to the overall plan or strategy that a researcher uses to conduct a study. It outlines the specific methods and procedures that will be used to collect and analyze data, as well as the rationale behind those choices. A research design is important because it helps ensure that the study is both feasible and scientifically valid. It involves making decisions about the research questions, data collection methods, sampling methods, data analysis techniques, and other important aspects of the study.

A well designed research study can help ensure that the results are reliable and generalizable to the broader population. Strategy was chosen to integrate different elements of the study in a logical manner ensuring effective address to the problem.

The research shall use descriptive survey to gather data (Kothari (2000) this research design is suitable to fulfill the objectives of this study that includes

establishing the use of centralized data management system, level of Principals knowledge and ICT skills, Government support in EMIS implementation in schools and availability of EMIS infrastructure. It is hard to observe all the players in EMIS implementation and this method provides a cheap and effective way to collect data in a large population and wide geographical area in a short time.

Table 3.2.1 Target population

Zones	No of principals	No of deputies	ICT teachers
Kaptel	5	5	5
Lelmokwo	5	6	5
Kapsabet	5	6	5
Mutwot	7	7	7
Kosirai	8	8	8
Kamoiywo	6	6	6
Kiptuiya	6	6	6
Sub county director	1		
Total	1	42	42	42

3.3 Target population

A target population is a group of individuals chosen for research or study. The targeted population in this study was the primary implementers of EMIS and the gate keepers in its penetration in secondary schools of Chesumei Sub County. This is the unit of observation and collection to which a sample will be derived zikmund, Babin, Carr and griffin (2012) the target populations were principals, deputy principals and ICT teachers in secondary schools of chesumei sub-county.

This were drawn from the 42 secondary school which comprises the sub-county day schools; county, extra county and National schools. It comprises of 42principals 42deputies 42ICT teachers and one sub county director of education giving a total of 127 target participants. The Sub County education director was purposefully targeted to get perspective on the government effort on EMIS implementation in the sub county.

3.4. Sampling Procedure and Sample Size

Sampling procedure is the technique used by researchers to gather people, places or things to be used in research (Kombo and Tromp 2006) Simple random sampling procedure was used however Purposeful selection of the ministry of education Sub county director in Chesumei was done due to the fact that the office could have information that other respondent might not have access to. Also purposeful selection of one national school was done due to the different

dynamics in funding and equipping of schools by the ministry of education also due to the fact that chesumei has only one National school.

In research, collecting data is a crucial step in the process of gathering information to answer a specific question or hypothesis.it is the systematic gathering of information from various sources, including surveys, interviews, observations, and experiments. The purpose of data collection is to obtain accurate and reliable information that can be analyzed and used to draw conclusions about the research question.

3.5 Sample size

Sample size determination is the act of choosing the number of observations or replicates to include in a statistical sample. In this study simple random sampling will be used in identifying schools as one national school shall be purposely selected. In research for a target population under 1000 a minimum ratio of 30% sample is advisable to ensure good representative of the population therefore sample size of 13 schools were picked from target sample of 40.One national school was purposely targeted to provide insight on the EMIS adoption in that category.

3.6 Data Collection Instruments

The instruments are research tools that encompass a wide range of instruments, techniques, and resources that researchers use to conduct their studies. These tools can vary depending on the research field and the specific objectives of the study (mugenda and mugenda (2003). Data was collected in the form of mixed open ended and closed ended questionnaires' to the deputy principals, principals and ICT teachers, an interview was conducted to the sub county director of education of chesumei and observation checklist was used to observe the presence of ICT infrastructure in the visited schools.

Questionnaire was chosen because of ease of use in collection of data in large population, wide geographical area and standardized method of analyzing. Additionally it is cheaper and saves on time. The study collected data from participants simultaneously. This enhanced the generalizability of the research findings. The questions and response options were pre-determined and consistent for all participants; this ensured that each respondent was exposed to the same set of items. This reduced variability in data collection and increased the reliability of the results.it also provided a sense of anonymity and confidentiality to respondents.

These Questionnaires generated quantitative data, which lends itself well to statistical analysis. The structured nature of the questionnaire responses allowed for easy coding, entry, and analysis of data. Conducting interviews is a common

method used in research to gather information from participants. It is important to ensure that the data collected is reliable and valid. The schedule for interview was organized for sub county director of education. Interview guide was prepared to get supplementary information on the determinants of adoption of EMIS.The tool was chosen because using interviews as a data research method is valuable for several reasons. Interviews allow researchers to gather detailed and in-depth information directly from participants.

By engaging in conversations, the study could explore participants' experiences, perspectives, and opinions more deeply than through other methods. Interviews provided an opportunity to gather rich contextual information. This contextual information added depth to the research findings. Interviews gave participants a platform to share their thoughts and experiences in their own words. This Research adapted the interview process and questions to suit the needs of the participant, allowing for a more personalized and tailored approach. This interactive nature of interviews allowed the study to explore complex topics in EMIS, uncover underlying issues.

By collecting data from multiple sources, such as interviews, surveys, and observations, the study can strengthen the validity and reliability of the findings or outcome. Interviews provided a qualitative perspective that complements quantitative data. Observation checklist was also used to confirm existing EMIS infrastructure. An observation checklist was prepared according to objective on

EMIS infrastructure stating what is to be observed. Observations allowed researcher to study phenomena as they occur naturally. This naturalistic context enhanced the ecological validity of the research, making it more applicable to real-life situations.

This tool helped the study to stay focused on the specific aspects it needed to observe, while also ensuring that it did not miss any important details. The observation checklist was essentially the list of items or criteria that the research needed to observe during the study. It was used in a variety of settings, such as in classrooms, offices and working spaces. This ensured that the, research study collected data in a systematic and objective manner.

3.7 Validity of the Instrument

Research instruments are integral components of any research study. It is important to ensure that the instruments used are valid and reliable in order to obtain accurate results. Validity refers to the extent to which a research instrument measures what it is intended to measure. In other words, it assesses whether the instrument is accurately measuring the concept or variable under investigation. Validity of instruments measures the degree to which the outcome of the research is true and consistent, if it brings out the exact elements that is being measured. It tests the performance of the instrument and reliability of the results it produces. (Robson 2011)

The study used several ways to check for validity of research instruments. One way was through content validity, which involved ensuring that the questions or items in the instrument are relevant and comprehensive enough to measure the intended construct this one done through research experts at the university. Construct validity was another method used to check for validity of research instruments. This method involved testing whether an instrument measured what it claims to measure by comparing scores on that instrument with scores on other measuring instruments that assessed related constructs.it was possible to do so through piloting.

The piloting was done in 2 schools (4.7%) and 6 (4.7%) respondents this was adequate as (mugenda and mugenda (2003) state that a pilot study should consist of 1% to 10% of the sample population.it helped to identify items that could be misunderstood and needed to be eliminated also the inconsistencies and deficiencies in the questionnaires were corrected.

3.8 Reliability Test

Reliability testing is an important step in the validation of research instruments to ensure that they consistently produce consistent and stable results. Reliability refers to the extent to which a measurement instrument consistently measures the construct it is intended to measure. This study used Test-Retest Reliability to assess the degree of consistency between the measurements (Middleton (2019). This method involves administering the same instrument to the same group of

participants at two different points in time The study selected participants from one school(2.3%) which was not included in research ,they were issued with questionnaires to answer then the same questionnaires were reissued after one week.

The scores obtained from the two administrations were then compared using statistical measures of correlation coefficients (Pearson's correlation) the coefficient alpha when equal to 1 is said to be stable, but scores of 0.7 to 1 are considered reliable the results yielded alpha of 0.78 therefore indicating the instruments were reliable.

3.9 Data Collection Procedures

The data collection include gathering of facts from data origin. Both primary and secondary data was considered albeit the main attention of the study was on the primary the participants were chosen to ensure the sample represents the larger population accurately. The study used the necessary instruments and tools to collect data. The quantitative data was collected using surveys, questionnaires. Qualitative data was gathered by the researcher through interview, the secondary data collection was done through observation protocols, and checklist forms.

Once the data was collected, it underwent validation and cleaning processes. Errors were checked, inconsistencies, or missing values in the collected data and were addressed accordingly. This ensures the data is accurate and reliable. The

data was validated and cleaned, various statistical and qualitative analysis techniques were applied to derive meaningful insights and draw conclusions based on the research objectives and questions. Data was analyzed using both quantitative and qualitative data. Qualitative data from the questionnaires were analyzed

The questions were grouped in thematic areas to establish the determinants to adoption of EMIS the content analysis was used to quantify the relationship between all the themed content. For Quantitative the study used descriptive statistics such as characteristics to determine the level of EMIS adoptions in schools, it helped to describe and summarized data to useful deductions this covered number of teachers with ICT skills and the number of schools and the subsequent levels of adoption of EMIS. It included percentages and frequency. Content analysis were arranged to position the responses into logical statements. The findings were presented in frequency distribution and percentages.

Cross tabulation were used to analyze relationship between variables. The reasons for choosing both methods were to improve in both reliability and validity (Babbie (1986) data was analyzed and interpreted, and the findings are presented in a comprehensive report

ETHICAL COSIDERATION

3.10. Licensing and Permissions

Permission was sought from relevant authorities to collect data NACOSTI, county security department, the county director of education and the teachers' service commission (TSC). Piloting was done on the instruments to test its accuracy. The purpose of the research was clearly stated to the subjects. The respondents were informed of their role and the confidentiality of their information. The data collection was confined to principals their deputies, ICT teachers and the sub county director of information of secondary schools of chesumei sub county. Copies of the questionnaires were issued to the principals, deputy principals and the ICT teachers the respondents were expected to cooperate.

The interview questions were administered to the sub county director of education. Observation checklist was used to identify visible ICT infrastructure. The results were compiled and analyses were carried out. In research it is important to consider the ethical implications of the study. Ethical considerations ensure that the rights and well-being of participants are protected, and that the research is conducted in a responsible and respectful manner. Key ethical considerations in research include informed consent, confidentiality, and privacy, minimizing harm to participants, and ensuring that the study has scientific merit.

Researchers must also was aware of any potential conflicts of interest or biases that may impact the results of their study. Smyth &Holian (2008) .The study had a clear statement of the purpose of research and the same was communicated to the participants and their role in it clearly stated. The means of information dissemination was established .The Consent for collection of data was obtained from relevant authorities; prior arrangements were made with the respondents to make appointments for the interview and questionnaires (Polit & Hungler 1995) the research was presented objectively and honestly.

CHAPTER FOUR

DATA ANALYSIS INTERPRETATION AND DISCUSSION

4.1 Introduction

The chapter reviews the results and analysis of the qualitative data, the compilation of the questionnaire and the result and analysis of the quantitative findings of the study. The study is also discussed on the light of the previous research findings and available literature where applicable; in order to identify similarities or differences the main purpose of this study was to find out determinants of implementation of Education management information system in chesumei Sub County in Nandi county Kenya. This chapter discusses the thematic areas according to the objectives.

The questionnaires used in this study were analyzed carefully to ensure data gathered was presented clearly in frequencies and percentages The theme areas covered include principals ICT skills, administrative support, ICT infrastructure and availability of centralized data management in school.

4.2 Questionnaire response rate

This entails those who gave full response to the questionnaires issued to them. This include the principals, deputies and the ICT teacher

TABLE 4.2.1 Response rate

Designation	sampled	N	%
Principal	13	10	76.9
Deputy	13	11	84.6
ICT teacher	13	6	46.2%

The results indicate response rate for the principal at 10 which is 76.9% deputies at 11 equivalents to 84.6% and 6 which is at 46.2% for the ICT teachers simultaneously. The low numbers of ICT teachers is affected by the fact that majority of the schools do not have a designated computer teachers another factor were the lack of computers to use and lack of ICT competent teachers to be appointed to the stated post, neither has the teacher employer (TSC) employed ICT teachers in majority of secondary schools of chesumei, this implies that school depended on teachers who can barely run simple applications.

This agrees with the discussion that the training of teachers on adoption and use of ICT in most developed countries have not been appropriate nor sufficient to enable its efficient adoption and use according to [Makhanu] 2010] Two schools did not have duly appointed deputies. Some principals were out for official duties and other responsibilities and could not respond to the questionnaires.

4.3 Demographic of the respondents

The respondents were asked to indicate their gender and titles which entailed principal deputy principal and the ICT teachers.

Table 4.3.1 demographic data of respondents

Demographic	Characteristics	**category**	**%**
Gender	Male	12	44.4
	Female	15	55.6
	Total	27	100

This study of the demographic data of respondents was to help the research to better understand certain background and characteristic of the respondents

The 13 schools covered showed the results in table 4.3.1 which indicate that the majority of the respondents are female at 15(55.5%) while 12(44.4%) were males. The possible explanation is that most females choose teaching as preferred career and their number increase is noted in the institutions of learning while males are reducing in number.

4.4. DESIGNITION OF THE RESPONDENTS

The respondent were requested to state their role in the school, to indicate whether they are the principal, deputy principal or ICT teachers

Table 4.4.1 Designations

Designation	sampled	N	%
Principal	13	10	76.9
Deputy	13	11	84.6
ICT teacher	13	6	46.2
Total	39	27	69.2%

The above table shows the designation of the respondents 76.9% were principals 84.6% were deputies and 46.2% were ICT teachers. Most schools do not have ICT teachers either appointed or employed by the government. This is a gap that affects the use of ICT in curriculum implementation unlike Zimbabwe which is ahead of most countries in Africa due to the fact that the country has inculcating ICT training in teachers colleges through college information technology enhancement programme (CITEP) if ICT is inculcated in Kenyan teacher training institution it will ensure seamless adoption of technology into curriculum. Recruiting ICT experts to schools should be given priority.

4.5 Teaching experience

The principals, deputies and ICT teachers were requested to indicate their teaching experience by the number of years they have served in the teaching profession.

Table 4.5.1 Teaching experience

Teaching experience	N	%
0-10	4	14.8
11-20	8	29.6
21-30	8	29.6
Above 30	7	25.9

This outcome determines the teachers work experience and as this can also determine their probability of using ICT in their respective roles in learner instruction experience is considered a good thing but in the use of ICT is likely to have an inverse results due to the fact that older generation did not interact with ICT as much as the younger generation. This also determines the teachers' perception and attitude towards ICT and it does affect adoption of the same into the school system

Teachers who had experience from 0-10 were 4 at 14.8% this group were more likely to be ICT teachers who had basic skills on use of computers, 11-20 and21-30yrs were the majority at 8 each representing 29.6% they were likely to be principals and deputy principals. Above 30yrs in service were 7 at 25.9% and majority were principals.

4.6. Principals Computer literacy

The principals were requested to tick where appropriate to indicate their ability to use basic computer skills, the table below shows a hundred percent computer basic skills cutting across the category of the respondents. This is a positive trajectory for technology; this could also be explained by the advent of easily accessible and affordable smart phones in the market.

Table 4.6.1 Principals computer literacy

Statements	**yes**	**no**	**%**
Are your computer literate	10	00	100
Total	10	00	100

The table above shows a hundred percent computer basic skills cutting across the category of the respondents. This is a positive trajectory for technology; this could also be explained by the advent of easily accessible and affordable smart phones in the market.

4.7 AVAILABILITY OF CENTRALIZED DATA MANAGEMENT SYSTEMS

The following items relate to ICT integration in data management in school, human resource, learner's data, financial management, curriculum implementation in schools and the correspondent with the different level of educational management. The principals, deputy principals were to respond due to

the fact they handle different facet of data management in school according to their designated responsibilities. The principal is the overall administrator who deals with human resource, students and correspondence with communities and higher level of education management, while the deputy oversee planning timetabling and student discipline. The ICT teacher while giving instruction to students on ICT is the main player in ICT use in school through assisting the principal and the deputy in the Technical aspect of ICT. The respondents were requested to share their views on a four point linkert scale starting with never, occasionally, partially, and fully. This was to establish the extend of centralization of data management in the selected institutions

Table 4.7.1 Resource software

Resource Software	never	occasionally	partially	fully	Mean	dev.
I use word to create lesson Notes and learning	2 (7.4%)	8(29.6%)	10(37.0%)	7(25.9%)	2.81	.904
Use spreadsheet for records, Exam analysis	2 (7.4%)	8(29.6%)	10(37.0%)	7(25.9%)	2.96	.999
Time tabling						
I use email to correspond With Colleagues and The ministry of education	00	6(22.2%)	6(22.2%)	15(55.6%)	3.83	.816
Have centralized data storage for learners and human resource	3 (11.1%)	6(22.2%)	16(59.25%)	2(7.40%)	3.38	.847
I use ICT for school financial Management and Electronic fee payment	00	4(14.5%)	8(29.6%)	15(55.6%)	3.40	.733

Key: Never, =0ccassionally, =partially, =fully

Results indicate that the availability of centralized data is inadequate. Those who never used word in creating lessons were 2 at 7.4% this is due to lack of sufficient

computers to be used by individual teacher for lesson creation and planning 8 respondents that is 29.6% used it occasionally may be for lack of demand to use the application or insufficient skills attributed to insufficient ICT infrastructure in secondary schools (swarts& Wachira 2010). 10 respondents at 37% used the application partially and only 7 at 25.9% stated they use it fully. The schools that have adopted fully are likely to have large learner population creating demand for efficiency and the school finance allows it to purchase the EMIS hardware and software. This agrees with (Kayombe 2017) cost of EMIS ownership is beyond the reach of most schools

Use of spread sheet for exam analysis and time tabling was insufficient as some schools still use manual methods 2 respondents (7.4%) stated that they have never used the spreadsheet, this could be due to lack of the right applications and infrastructure. There is also a possibility that lack of awareness to the products in the market could contribute to the low uptake and use of the technology, 8 (29.6%) stated that they use it occasionally this could be due to the limited ICT knowledge and lack of expertise on use of application .10(37%) stated that they use it partially while 7(25.9%) indicated that they use it fully.

The economic disadvantage of under enrolled and underfunded schools and the rural nature of chesumei Sub County may have contributed to the inability to acquire the applications since they are purchased from the vendors with undefined market price and the constant need for upgrading the existing ones. This

phenomenon agrees with the observation that application use and efficiency change so fast that upgrading the system becomes a constant and expensive venture and also the radical changes in the education makes obsolete the use of existing infrastructure. This agrees with (lovey (2010) that small schools are unable to keep up with fast changing technology and soon fall back to the old traditional system.

This agrees with the observation made by Kayombe (2017) on the cost of ICT ownership. Emails for correspondence was ranked as the most used, all respondent indicated that they had used Email at one time or the other. Possible reason are social factors due to the respondents familiarity and availability of smart phones also due to demand from the employer to correspond by EMAIL.15 respondents that is 55.6% stated that they use email fully in correspondence with employer and ministry of education, 6 respondents at 22.2% indicated partially while 6 respondent at 22.2% indicated occasionally.

Respondents noted the time saved when using electronics for correspondence, and that the platform is easy to use and does not require complicated skills to handle this agrees with the theory of diffusion of innovation Rogers (1962) the cost of implementation and the ease of use and maintenance of the technology .Availability of centralized data storage was not significant with 3 respondents 11.1% having partially installed it 6 respondents at 22.2% occasionally use, 16(59.25%) have partially implemented just 2 respondents at 7.40% have fully

functional centralized system. The study noted that national school and those with high population are likely to have the system fully functional due to higher funding from the government, school fees from parents and other available resources

Establishing and maintaining centralized data management require financial investment in the hardware and software, training of the end users and a robust maintenance team, this maybe out of reach for most schools. The infrastructural establishment, reliable internet connectivity and power supply are essential for effective centralization. The sub county director noted the lack of vote head in the government funding structure for ICT functions. This agrees with the observation that the failure of centralization of data in schools is also attributed to insufficient funding and ICT infrastructure in secondary schools (swarts& Wachira (2010) the respondents were required to state the rate of use of ICT for financial management.

Most schools recorded progressive use of ICT in financial management15 (55.6%) indicated that they have fully implemented EMIS in finance, 8(29.6%) have partially used4 (14.5%) use it occasionally. The impressive usage of ICT in finance could be due to availability of the technology and service providers like telecoms and banks providing free automation of fee payment technology and the demand from parents to ease paying of fees due to their increasingly demanding schedules.

All schools are engaged in digitizing their system but they are in different stages of progress, the schools that have not adopted much of ICT in their financial management identified financial constraints as a major factor and could not afford the initial cost of the hardware, lack of expertise to run the digital financial system for accounting may have brought hesitation in the adoption of the technology few principals could use accounting spreadsheet sufficiently, security and privacy concern about school financial data and personal information were also an important factor.

According to the sub county Director the Ministry is keen to ensure that schools adopt digital financial management because it has been noted that it improves accountability he pointed out that:.

"…….*The introduction of NEMIS was aimed at enabling the government monitor enrolment in schools and ensure all funds channeled to a learner are accounted for…...*

Those that have implemented ICT fully in financial management system who are the majority claims to have recorded easier collection of fees, improved tracking of expenditure and reduced wastage. This agrees with the Davis (1989) of the increased adoption of innovation due to perceived usefulness.

4.8. Level of principal knowledge and ICT skills on adoption of EMIS

The following items relates to the expertise in ICT use, and integration in the school system. This was intended to establish the respondents ability to use technology for the daily activities in chesumei sub county secondary schools.it include the use of accounting spreadsheet, record keeping and ability to retrieve information ,Publishing and internet browsing

Table 4.8.1 productivity software

Productivity software	none	Average,	Highly skilled	Advanced	mean	dev.
Accounting spreadsheet (numbers)	4(14.8)	8(29.6)	5(18.5)	10(37.0)	2.77	1.10
Database records keeping And updating	3(11.1)	10(37.0)	8(29.6)	5(22.2	2.63	.419
Creating storing and retrieving information	---	10(37.0)	12(44.2)	5(18.5)	2.81	.722
Sending and receiving electronic messages	----	4(14.5)	16(59.3)	7(25.9)	3.11	.69
Producing print documents in desktop	2(7.4)	4(14.5)	14(51.9)	7(25.9)	2.96	.828
Browsing the internet	-------	4(14.5)	12(44.4)	11(40.7)	3.25	.699

Key -none, average, highly skilled, advanced

The results on the table above indicates that computer skills of the respondents of chesumei Sub County is good but not sufficient.10(37%) were advanced in the use spread sheet8(29.6%) stated that they were highly skilled while 4(14.8%) had no skill at all. Those who indicated highly skilled have the ICT hardware and software visibly at their disposal and have likely sharpened their skills by the regular use and familiarization of technology. Despite this, there is limited knowledge and training on the use of spreadsheet possibly for lack of awareness in some institutions on the benefit of using accounting spreadsheet or inability to purchase the technology.

The software and hardware are expensive for small schools with limited finance to acquire and sustain. This agrees with the statement that the cost of EMIS ownership is beyond the reach of most schools (Kayombe 20170). This has reduced school to continue use of the manual and archaic means. The respondents were required to state the level of their skill on use of database for record keeping and updating, highest number at 10(37%) used data base for keeping and updating records 8(29.6%) marked highly skilled while 5(22.2%) stated they had advanced knowledge and skill while 3(11.1%) had no idea at all about the above skill.

This is impressive progress and the respondents who had no skills at all could point to lack of uniformity in training of teachers' and possibly lack of awareness of the product. In Creating storing and retrieving information 5(18.5%) marked themselves as advanced in their skills while14 (44.2) stated they are highly

skilled, 10(37%) responded that they are average .the difference in this skill set could be noted in the age of the responded the older ones were likely to marked themselves average. The younger respondents were likely to be highly skilled or advanced. The lower the age of the respondent the higher the skilled and the reverse are true. The availability and accessibility of required gadgets to carry out the operations greatly affected the level of skill development,

The respondents were required to state the skills of sending and receiving message 16(59.3%) respondent stating that they are highly skilled while 7(25.9%) stated that they had advanced skills.4(14.5%) marked themselves average. the availability and regular use of smart phones have greatly supported and improved the acquisition of this skill. This support the theory that the intention to use any technological innovation is influenced by two things, perceive ease of use and the perceived usefulness (Davis (1989)

The ability to print and publish 2(7.4%) stated that they had no skills 14(51.9%) were highly skilled while 7(29.9%) had advanced ability and those who indicated average were 4(14.5%).this is a positive indicator in most institution however the institutions that had no printers and limited access to computers were likely to have respondents to having no skill at all.

On browsing the internet 11(40.7%) 0f respondents indicated advanced skills, while 12(44.4%) are highly skilled, 4(14.5%) were of average ability none responded to Never. The advent of smart phones has greatly improved the skills

of teachers in browsing the internet this agrees with (Davis. F (1989) that the school leadership would use technology if there is a perceived ease of use, this can be greatly noted in the high use of technology in accounting spreadsheet and browsing the internet. The studies also agree with Serhans (2007) that technology training of school leadership foster principals' attitude towards introduction of ICT in the classroom.

4.9 Ministry of Education support in Adoption of EMIS

The items relate to support for EMIS adoption given by the government and the school management board to the schools. These include government provision of hardware and software to schools, ICT technical support, regular workshop to train teachers on ICT skills and provision of budget for EMIS adoption and maintenance. This questionnaire was answered by principals, deputies and the ICT teachers since the questions therein cut across their job designation

Table 4.9.1 Government support in adoption of EMIS

STATEMENT	N	R	O	A	M	dev.
Government provide hardware and software	----	6 (22.2%)	16(59.3%)	5(18.5%)	1.96	.547
There is technical support and maintenance	8(29.6%)	6(22.2%)	10(37.0%)	3(11.1%)	2.96	1.01
Regular workshops for training	2(7.4%)	16(59.3%)	9(33.3%)	---	2.25	.583
Onsite technician for teacher assistance	8(29.6%)	8(29.6%)	11(40.7%)	----	2.11	.831
Availability of budget for computer activities	6 (22.2%)	6(22.2%)	15(55.6%)	-- -	2.23	.816

Key; 1never 2.rarely 3often 4.always

Respondents were asked to indicate the level 0f government support to implementation of EMIS 16(59.3%) of respondents stated that rarely does the government provides computer hardware 6(22.2%) responded that they have never received any government support while 5(18.5%) marked occasionally this indicate that despite government policy on e-learning it has not put in the resources to ensure schools have computers.

The deputies, principals and ICT teachers had the following respond On the technical support 8(29.6%) indicated that they have not had any technical support

from the government6(22.2%) have rarely been given technical support and 3(11.1%) indicated that they always get technical support from the government.10(37%) indicated that they occasionally are given technical support by a government. the availability and extend of ICT technical support vary from one school to the other depending on capacity and availability of resources

According to sub county director of education interview respond on the same he said the government have recognized the importance of ICT and has implemented various programs such as Kenya Institute of Curriculum Development (KICD) which offers training and technical support. The coordination and collaboration with schools needs to be improved to ensure all schools are reached and teachers trained and get sufficient support. This agrees with Jo Tondeur et al that just placing ICT infrastructure in schools does not translate to use of the technology.

Data showed2 (7.4%) indicated that they have never had workshops 16(59.3%) rarely get the workshops while 9(33.3%) get workshops occasionally the study noted that teachers and administrators are not given adequate in-service training to enable them fully utilize the available ICT tools this agrees with Makhanu (2010) for the need for suitable curriculum for training of tutors on information technology. The teachers were required to state the level of budget allocation for implementation of EMIS in their institution In the budgetary allocation15 (55.5%) indicated that occasionally they get budget for ICT activities 6 (22.2%) indicated

that they rarely get budget and 6(22.2%) indicated that they never get any funding completely non indicated that they always do.

The study agrees with (Taiwo et al 2021) on how lack of political goodwill, poor or ineffective policy framework, lack of administrative support and poverty affects EMIS adoption and implementation. The county education officer on the government supporting EMIS implantation noted that current inclusion of computer science as an area of study in school is an encouraging move to the mainstreaming technology in schools. The respondent also noted the improved requirement for ICT use in the CBC curriculum as a welcome impetus to EMIS .He remarked:

…….. *"The ministry has not allocated enough funds for training of teachers and this has guided the policy framework of (2021) on the information and communication technology in education and training that is to provide framework that will guide ICT integration in education and training the government initiative to train ICT school champions as a way of demystifying technology and encouraging teachers to use it on regular school programs is a notable milestone towards incorporating EMIS in schools. There is also a noted effort by the government to supply schools especially primary with computers*" he also highlighted government shift to electronic management of learners by stating thus…….

"The introduction of NEMIS for learner data management has shifted learner management from manual to digital, schools are encouraged to open websites and have a presence in the internet world. The current government roll out of free Wi-Fi will assist schools with low fund and resources to take advantage of it, the last mile electricity connectivity has boosted schools joining the national grid and improve uptake of technology .The ministry of education is seriously considering to employ computer expert and interns to bridge the gap of technical assistance in schools"……..

4.10 Availability of EMIS infrastructure in secondary schools of chesumei

This was an observation checklist. The questions were meant to confirm the availability or lack of ICT infrastructure like electricity, internet connectivity, computers and laboratories .The study were required to tick YES or NO.

Table 4.10.1 Observation checklist

ITEM	YES	NO	Mean	dev.
Power grid connectivity	11(84.61)	2(15.38)	1.18	.308
Internet connectivity	7(53.84)	6(46.15)	1.14	.500
Enough computers	3(23.07)	10(76.92)	1.77	.416
Computer laboratory	5(38.46)	8(61.53)	1.63	.483

The respondents were required to tick YES or NO.

High number of schools have connection to the power grid at 11(84.61%) while 2 schools at (15.38%) are yet to be connected this is commendable and positive trajectory although no school in this digital age should be left without electricity. This is due to the last mile connectivity campaign that was carried out by the Kenyan government that ensured most schools are connected to the national power grid.7(53.84%) had some form of internet connectivity through routers and Wi-Fi while 6(46.15%) had no internet connectivity completely at all. This agrees with the statement by Kanyara (2022) that teachers are forced to use their personal data to carry out school activities.

10(76.92%) do not have enough computers, this is possibly brought about by the prohibitive cost of the hardware and possible lack of power connectivity that have discouraged some schools from purchasing computers. 3(23.07%) indicated that they had enough computers which are likely to be schools with high population which means fees can provide sufficient funds, or schools sponsored by non-governmental organization or National school thus getting sufficient funding from government.

On computer labs 8(61.53%) had no computer lab, 5(38.46%) have computer laboratory though ill equipped. This is possibly brought about by the prohibitive cost of setting up a laboratory, apart from the building and computer hardware there is expensive electrical work, furniture and storage units, software licensing cost and the budget for the maintenance cabling and possible power backup, a big

number schools can hardly afford such costly undertakings. This will definitely hinder schools use of ICT in curriculum implementation and adoption of EMIS. This agrees with (Nkata et al 2019) that lack of ICT infrastructure and the cost of ownership of EMIS tools affects the full adoption of EMIS. The study also agrees with (swarts and Wachira 2010) that failure to use ICT is attributed to insufficient infrastructure in secondary schools.

CHAPTER FIVE

SUMMARY OF THE FINDINGS CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the findings, the conclusion, summary and recommendations of study. The study explores the role of Education Management Information Systems (EMIS) in education and curriculum implementation. It investigated into the determinants of adoption of EMIS, which include centralized data management, Ministry of Education support in adoption of EMIS, level of principals ICT knowledge and availability of EMIS infrastructure in secondary schools of Chesumei.

5.2 Summary of the Findings

The study revealed that majority of the schools had fragmented data management system. The schools that lacked EMIS system completely were likely to be county day schools that also had no or minimal ICT infrastructure possibly due to financial constrains .most schools have used ICT for financial management in one form or another though the level of use depended on school learner population and sources of school funds .The availability of service providers like Telco's and mobile banking systems that provides cheaper options for establishing the financial management system in schools could have possibly contributed to the

high use of ICT for financial management, also the demand for quicker and easier way of paying fees by the parents could be another contributing factor. The study found that there is need to provide affordable internet connectivity, computers and general ICT infrastructure as this greatly can improve on adoption of EMIS.

The study assessed the computer literacy of principals of secondary schools of chesumei Sub County. The findings revealed that the ICT skills possessed by the principals were basic and therefore insufficient most of the time, this could be attributed to age of respondent, inadequate training, and technology phobia from the principals, however it should be noted that demand by the ministry of education requiring them to do school records and correspondence using technology (NEMIS) has forced some to take their school work to cyber cafe for assistance exposing schools to possible data breach

To determine the Ministry of education supports to adoption of EMIS the study found that the ministry of education and school boards of management support was inadequate especially in training as most schools noted low workshops attendance and low to nonexistent ICT technical support.

The study also found that Government funding to schools for the adoption of EMIS was insufficient as the government had not set aside funds or provided vote head for the acquisition of computers, and other EMIS infrastructure and for maintenance. Most schools could afford only one computer and a printer which was not sufficient to run school EMIS requirement. To determine the availability

of ICT infrastructure majority of the school had electric connectivity but lacked internet connectivity. This was mainly due to financial constraint and inability to purchase and sustain internet connectivity.

Some schools had the hardware for internet but lacked the software applications. This was possibly due to fast changing applications and new innovations that required the schools to do expensive upgrades but with little financial muscles schools could not keep up. The ICT infrastructure in schools were therefore inadequate

5.3 Conclusions

The drive for digitizing schools cannot succeed without equipping of institutions with EMIS infrastructure. The government can make good policies but without the framework for implementation its actualization might not be realized. Education management information system in chesumei Sub County is functional but fragmented. Schools have no Idea on the roadmap to follow to ensure the system is fully utilized considering that the governments have not provided uniform guidelines on implementation and use of EMIS. Therefore it can explain the different levels of implementation of EMIS by different categories of schools.

5.4 Recommendation

In the conclusion of the study the following recommendation were made on the policies and further research.

5.4.1 Recommendation for policy

In regards to the findings of the study;

The ministry of education should create a functioning ICT department at both the national and Sub County level to deal with EMIS implementations in the schools; it should further create policy framework and guidelines on implementation of school level data management and information system

Furthermore the Ministry of Education should facilitate regular continuous training of teachers and administrators to impart them with current practical skills to enhance their ICT skills, knowledge and EMIS adoption

A recommendation for the Ministry of Education to employ more ICT experts in schools and all level of educational management to improve on adoption and use of EMIS and the maintenance of the information systems

The government should provide sufficient funds for acquisition of ICT infrastructure in schools, funds for acquisition maintenance and improvement of internet connectivity in schools across chesumei Sub County and to the country at large.

5.4.2 Recommendation for future research

The study was restricted to secondary schools of chesumei Sub County, the study recommend a research is carried out on the impact of ICT infrastructure in primary schools of chesumei Sub County

A recommendation for the study on the institutions that have already adopted EMIS to find out how they sustain their Data management systems and ensuring data safety and privacy

Research study should be done on the long term cost implication on the sustainability of EMIS

A recommended study on how the rapid changes in innovation of technology affect the adoption of ICT and EMIS in educational institution the longer

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Appendix I: Letter Of Introduction

Dear respondent

I am a post graduate student in the school of education department of Educational administration, conducting a study on determinants of EMIS use in secondary schools of Chesumei Sub County Nandi in partial fulfillment of the requirement for master in education administration. You have been randomly selected to participate in responding to this questionnaire. All confidentiality principles shall be adhered to.

Thank you

Yours faithfully

Rachael Chepngetich

Appendix II: Principal Deputy Principal And ICT Teachers Questionnaire

Participant code: [ ] [ ] [ ]

Please answer the following questions by ticking appropriate box or relevant answer where space is provided.

PART 1: DEMOGRAPHIC DATA

Sex of respondents 1.male…….2.female

2. Designation……principal ☐ D.Principal ☐ ICT ☐

3. Teaching experience……

0-10yrs ☐ 11-20yrs ☐ 21-30yrs ☐ above 30 ☐

4. Are you computer literate? YES ☐ NO ☐

PART II: availability of Centralized Data Management System

The following items relate to ICT integration in data management in school. Human resource, learner's data, finance and learning in schools and the correspondent with the outside world.

Please indicate the current level of use by ticking

Resource software	never	occasionally	partially	fully
I use word to create lesson notes, learning programs				
I use spreadsheet for records, exam analysis and time tabling				
I use email to correspond with colleagues and ministry of education				
I have centralized data storage for both learners and human resource				
I use ICT for school financial management and electronic system for fee payment				

KEY: Never, =0ccassionally, =partially, =fully

Part III: level of Principal Knowledge and ICT Skills

The following items relates to your expertise in ICT use and integration in the school system

Please rate yourself according to current ability.

Productivity software	non	average	Highly skilled	advanced
Accounting spreadsheet(numbers)				
Database records keeping and updating				
Creating storing and retrieving information in word processing				
Sending and receiving electronic messages				
Producing print documents in desktop publishing				
Browsing the internet				

Part IV: Administrative Support

The items here relate to support for ICT use given by the government and the school management**.** Please indicate the level of support by ticking the appropriate box

Statement	never	rarely	often	always
Government provide consistent hardware and software				
There is a timely technical support and maintenance of computers				
Regular workshops for training				
Onsite computer technician for teacher assistance				
Availability of budget for computer activities				

Key: 1. Never 2.Rarely 3.often 4.Always

Part V: Availability of ICT Infrastructure

Please tick if the following infrastructure is available in your school.

ITEM	Available	Not available
Power grid connectivity		
Internet connectivity		
Enough computers		
Computer laboratory		

Appendix iii: Interview schedule for Sub County Director of Education

1. Do secondary schools in chesumei have centralized data management?
2. How do schools in secondary school of chesumei manage the centralization of school data?
3. What is the level of principals ICT skill in secondary schools of chesumei.
4. How does the ministry of education support the integration of ICT in schools?
5. Does the ministry have ICT expert that give institution technical support?
6. how equipped are secondary schools of chesumei in ICT infrastructure
7. In your opinion what recommendation would give to improve ICT adoption in schools?

Appendix VI: Observation Checklist

Observation	**Available**	**Not available**
Availability of Computer Laboratory		
Internet Connectivity		
Power Availability		
Computers Hardware		
Use of computers in classroom		

Appendix VII: Permits and licenses

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 931297

Date of Issue: 02/March/2023

RESEARCH LICENSE



This is to Certify that Miss.. Rachael chepngetich of Koitaleel Samoei University College, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nandi on the topic: DETERMINANTS OF ADOPTION OF EDUCATION MANAGEMENT INFORMATION SYSTEM [EMIS] FOR DATA MANAGEMENT IN CHESUMEI SUB COUNTY-KENYA for the period ending : 02/March/2024.

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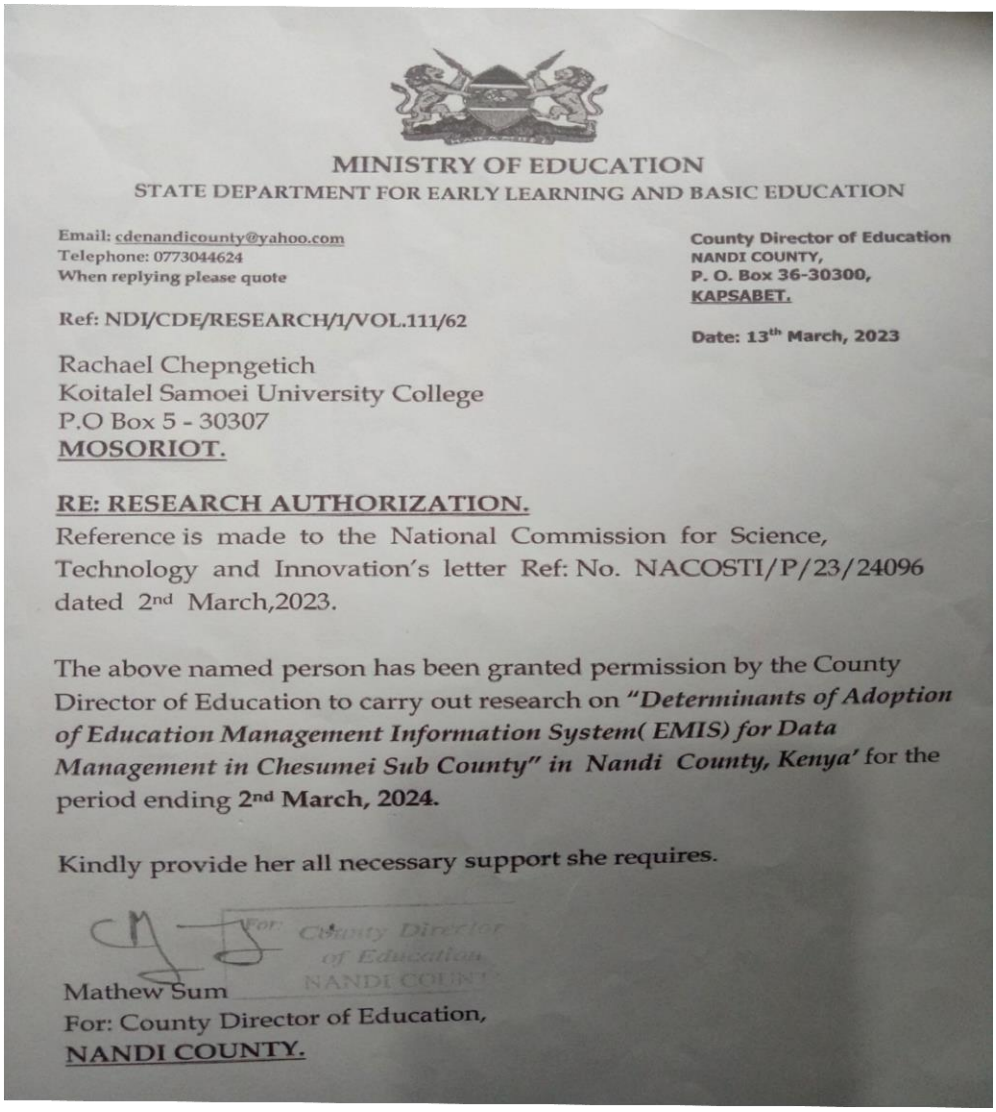
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MINISTRY OF EDUCATION
STATE DEPARTMENT FOR EARLY LEARNING AND BASIC EDUCATION

Email: cdenandicounty@yahoo.com
Telephone: 0773044624
When replying please quote

County Director of Education
NANDI COUNTY,
P. O. Box 36-30300,
KAPSABET.

Ref: NDI/CDE/RESEARCH/1/VOL.111/62

Date: 13th March, 2023

Rachael Chepngetich
Koitalel Samoei University College
P.O Box 5 - 30307
MOSORIOT.

RE: RESEARCH AUTHORIZATION.

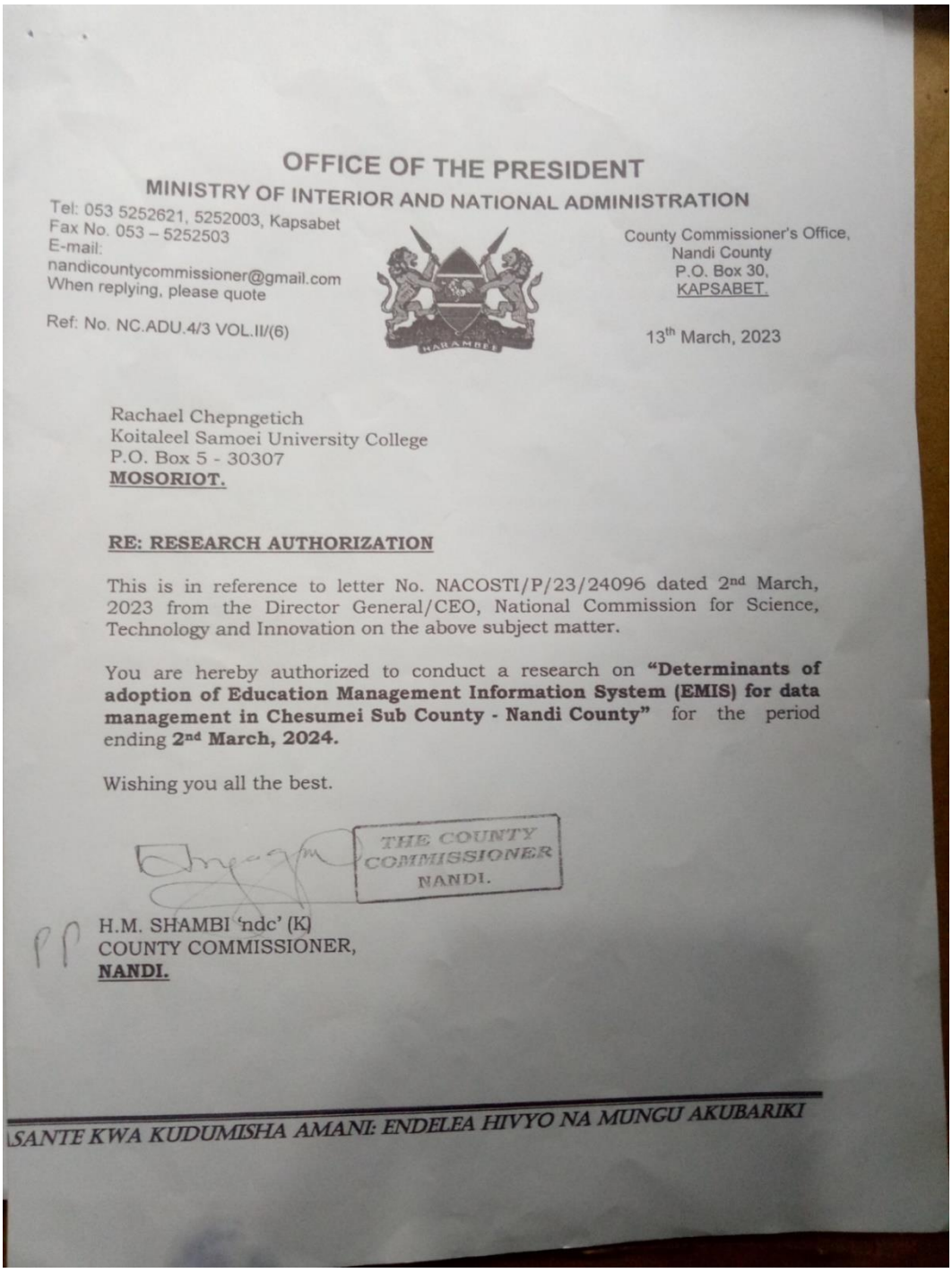
Reference is made to the National Commission for Science, Technology and Innovation's letter Ref: No. NACOSTI/P/23/24096 dated 2nd March,2023.

The above named person has been granted permission by the County Director of Education to carry out research on ***"Determinants of Adoption of Education Management Information System(EMIS) for Data Management in Chesumei Sub County" in Nandi County, Kenya'*** for the period ending **2nd March, 2024.**

Kindly provide her all necessary support she requires.

For: County Director of Education NANDI COUNTY

Mathew Sum
For: County Director of Education,
NANDI COUNTY.



OFFICE OF THE PRESIDENT

MINISTRY OF INTERIOR AND NATIONAL ADMINISTRATION

Tel: 053 5252621, 5252003, Kapsabet
Fax No. 053 – 5252503
E-mail:
nandicountycommissioner@gmail.com
When replying, please quote

Ref: No. NC.ADU.4/3 VOL.II/(6)

County Commissioner's Office,
Nandi County
P.O. Box 30,
KAPSABET.

13th March, 2023

Rachael Chepngetich
Koitaleel Samoei University College
P.O. Box 5 - 30307
MOSORIOT.

RE: RESEARCH AUTHORIZATION

This is in reference to letter No. NACOSTI/P/23/24096 dated 2nd March, 2023 from the Director General/CEO, National Commission for Science, Technology and Innovation on the above subject matter.

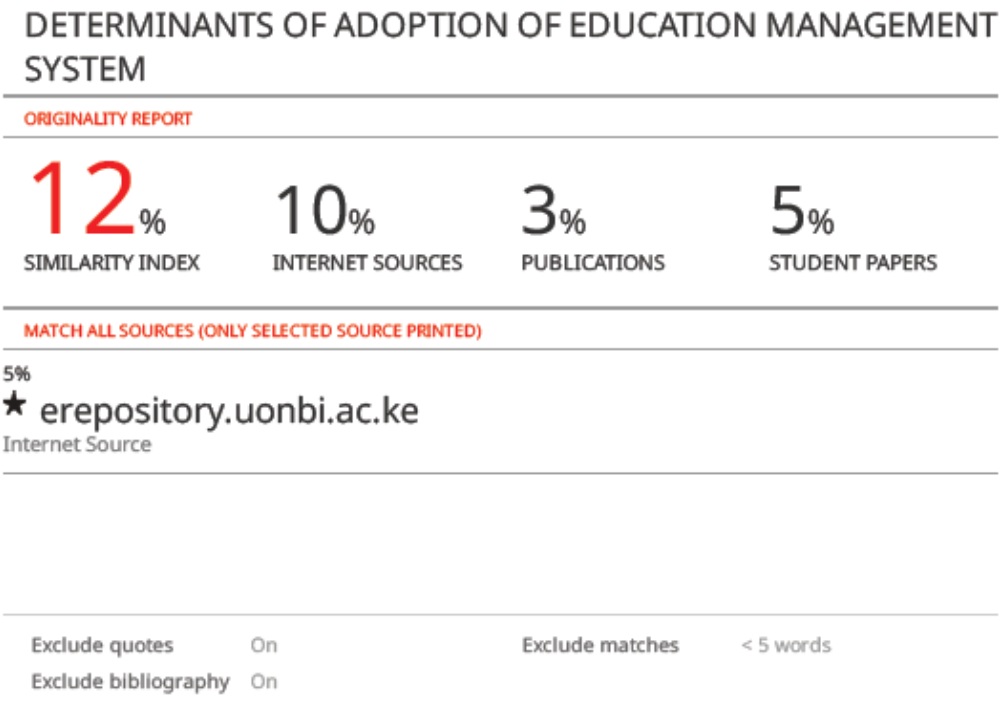
You are hereby authorized to conduct a research on **"Determinants of adoption of Education Management Information System (EMIS) for data management in Chesumei Sub County - Nandi County"** for the period ending **2nd March, 2024.**

Wishing you all the best.

THE COUNTY COMMISSIONER NANDI.

H.M. SHAMBI 'ndc' (K)
COUNTY COMMISSIONER,
NANDI.

SANTE KWA KUDUMISHA AMANI: ENDELEA HIVYO NA MUNGU AKUBARIKI



DETERMINANTS OF ADOPTION OF EDUCATION MANAGEMENT SYSTEM

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