# SECONDARY SCHOOL PRINCIPALS' LEVEL OF PREPAREDNESS AND ADOPTION OF NATIONAL EDUCATION MANAGEMENT INFORMATION SYSTEM IN KEIYO NORTH SUB-COUNTY, KENYA

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Samson Manani Kasimiri
Post Graduate Student: Department of Educational Management and Policy Studies
Moi University Kenya
sammanani@gmail.com

Professor James Sang
Lecturer, Department of Educational Management and Policy Studies
Moi University Kenya.
jjsang@gmail.com

Dr. Saina Shadrack
Lecturer, Department of Educational Management and Policy Studies
Moi University  Kenya
sksaina81@gmail.com

Dr. Moses Beru
Lecturer, Department of Sociology, Psychology and Anthropology
Moi University  Kenya
mosesberu2000@gmail.com

## ABSTRACT

**Purpose:** The study investigated the level of preparedness of secondary school Principals to adopt the National Education Management Information System (NEMIS) in Keiyo North Sub-County, Elgeiyo-Marakwet County in Kenya.

**Methodology**: It was an explanatory research based on the Unified Theory of Acceptance and Use of Technology (UTAUT) and the public choice theory. A target population of 30 secondary schools Principals and 30 HODs in charge of ICT in Keiyo North Sub-County schools consisting of Boarding and Day secondary schools was used. This formed a population of 60. The schools were classified as National, Extra-County, County and Sub-County secondary schools. This ensured that all the sub-groups were proportionately represented. Quantitative data was collected using close-ended questionnaires and analyzed using descriptive and inferential statistics. A model was developed through regression analysis.

**Findings:** Results indicate that the sub-variable of Principal's level of preparedness (acceptance, training and skills, and ICT infrastructure) had a statistically significant positive effect on adoption of NEMIS in secondary schools. The finding of this study is useful to the Ministry of Education (MOE) in planning purposes. The constructs of Principal's level of preparedness (acceptance, training and skills and ICT infrastructure) positively and significantly correlated with adoption of NEMIS and as these constructs are enhanced, adoption of NEMIS receives a positive boost.

**Unique Contribution to Theory Practice and Policy**: The study points out that use of technology is a function of acceptance by the user and is in line with the postulates of UTAUT theory that drove this study. It is therefore recommended that managers in the education circles should pay greater attention to the postulates of UTAUT theory for effective implantation of ICT driven programs like NEMIS. The study further points out that for any government policy to succeed, those in authority should allocate resources for public interest to support such policy rather than follow their own self-interest as pointed out by the public choice theory.

**Keywords**: *Preparedness, Adoption, Acceptance, Training, Skills, Infrastructure.*

## INTRODUCTION

Management Information System (MIS) is becoming one of the most important assets for any organization competing in the 21st century economy (Yasin M. Karfaa, 2015) It is a tool that has been used in other sectors of the economy majorly in financial sector to monitor and control wastage in the sector. When it was first conceived, its original intention was to automate manual and pre-computer mechanical processes, but at present, MIS has significantly matured and its roles and functions have extended and thus becoming applicable to other sectors like education.

An information system is an organized combination of people, hardware, software, communication networks and data resources that collects, transforms and disseminates information in an organization (Mohamad Noorman Masrck, 2009) Information is a key ingredient in an effective education system. Effective education policy making in any country requires accurate and timely information about educational inputs, resources, governance, operations and outcomes of its education system. Education Management Information System (EMIS) provides systematic, quality data in a structured environment that enables utilization of information produced in planning and policy dialogue (SABER, 2016). It aims at helping countries identify how they can improve on data collection, system management and data use in decision making, thereby improving different element of the education system (Abdul-Hamid, 2014)

EMIS is responsible for producing and monitoring education statistics within an education system. It has a multifaceted structure comprising the technical and institutional arrangements for collecting, processing and disseminating data in an education system. It is crucial for tracking changes and for facilitating the utilization of information in decision making by policymakers. The system effectiveness is dependent upon its sustainability, accountability and efficiency. A successful EMIS is credible and operational in planning and policy dialogue (Abdul-Hamid, 2014)

It is in this respect that people who use EMIS especially at the basic level should be competent enough in data handling and have positive attitude towards the use of new technology in data management which calls for continued training and capacity building of secondary school managers for them to be effective and efficient in the use of NEMIS.Despite the important role played by EMIS, its use in many countries especially in developing world remains a matter of concern (Marcia Bernbaum, 2011) Many countries including Kenya have adopted the use of EMIS. However, some have already failed (Wako, 2003). Developing a working EMIS requires good internet connectivity, well trained human resource, positive attitude towards EMIS and commitment by those in authority (Trucano, 2006). These factors are lacking in most countries, Kenya being no exception.

As a result of the Education sector being important, most countries all over the world have continuously allocated massive resources to it in order to stimulate economic growth and development. However, allocation of resources in education is largely dependent on data provided by managers who are based on the ground such as Principals and heads of learning institutions. Information provided by these people at times has never been correct and timely and this is the reason why most countries have adopted the use of EMIS so as to reduce inaccuracies and wastage of time in data collection.

Policy makers often use education statistics as a point of reference for political decisions, even in an environment where the political economy of education suggests that policy analysis takes a

backseat to political decision-making. The goals of effectiveness, efficiency (including reducing costs) and equity drive the demand for evidence-based decisions (Abdul-Hamid, 2014)

Data-driven planning is more effective for an education system. This type of planning reduces costs by more effectively allocating resources. Given that needed data exist and is timely, the added cost of improving this data is likely much lower than the implicit costs of bad information. Planning with old data inhibits optimal policy implementation, particularly with respect to resource allocation. If enrollment data only becomes available later after a school year begins, there is little a government can do to reallocate teachers to improve student-teacher ratios across the school system for that year. Overcrowded classrooms will be futile, coming one year late. In addition, without the ability to verify or audit education system data, the volume of misallocation resources can be significant. If a government transfers resources based on enrollment and enrolment information is inaccurate, unnecessary funds will be spent (Abdul-Hamid, 2014). In Kenya, capitation is based on the NEMIS data. If this data is inaccurate, the deserving students may end up being denied capitation and thus making running of school where they were admitted difficult for Principals. This was witnessed in Malava Sub-County where school heads complained through the chair Kenya Primary School Heads Association (KEPSHA) and to birth registration department to speed up birth registration so as to enable them meet the deadline of presenting NEMIS reports before the government could allocate funds to schools (Wakhungu, 2019). On the other hand, innacurate data can make certain schools to get more funds than they deserve which might contribute to embezzelment of public funds by some unscupulous school administrators due to the surplus funds provided by the government.

According to (Abdul-Hamid, 2014), there is a misconception often held by education stakeholders that EMIS is simply a database or an Information Technology (IT) system. People, specifically school managers who happen to be Principals, are an important component of EMIS in that they not only guide the collection, maintenance and dissemination of data, but they also lead the transformation of data into statistics that are used to inform decision making. This therefore creates the need to equip those endowed with the responsibility of data handling with the necessary skills and creating an enabling environment in terms of ICT infrastructure that supports the use of EMIS.

**Components of Education Management Information System**

An EMIS requires technological infrastructure which includes computers, internet, intranet, and telephone lines among other information communication and technology (ICT) gadgets so as to perform its role effectively (Muhia, 2016). It also requires people with skills and right attitudes combined with correct processes.

Figure 1 below shows what an Education Management Information System requires.
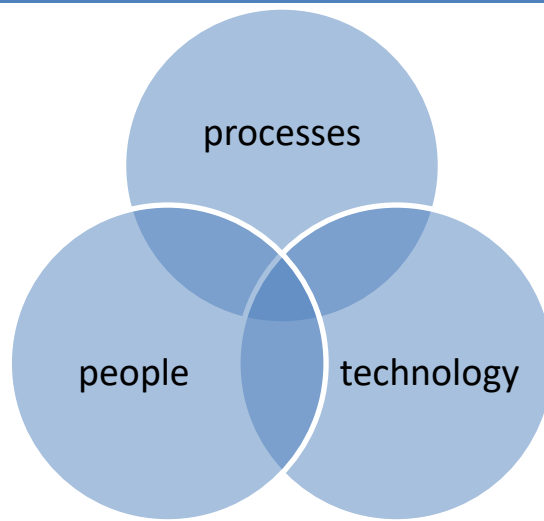
**Figure 1 Components of Education Management Information System.**

Source: (Marcia Bernbaum, 2011)

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

Education Management Information System was launched at national level in the year 2017 by the then Education Cabinet Secretary, Dr. Fred Matiangi. It is an online-based data management solution which collects data and information from educational institutions, processes and reports the status of designed indicators and provides the sector with solid ground for effective management to ensure that every learner counts (Rotich, 2019).

The main objective of NEMIS in Kenya was to help MOE to gather accurate and real time information on learners and learning institutions. The ministry will also be able to secure factual and accurate information for proper planning and resource allocation. The specific objectives include: online platform for capture of education data at school levels, platform that allows all education agencies to share data collected to ease and facilitate administrative and decision making processes; provide an integrated business intelligence (BI) that provide statistics used to report national and international indicators in education and training sub-sectors; provide flexibility of handling of resources that go to education institutions; help in training and lastly, develop an online platform that will help in geographical analysis of education indicators. It will also help in addressing the issues of better governance which includes accountability, transparency and efficiency. This is expected to be decentralized to lower levels, basically the school level. Despite all these benefits of NEMIS, the system has not been fully implemented in the country due to several factors.

In the use of NEMIS for instance, the ministry of education faced several challenges; among them was constant change of data, lack of birth certificates and slow internet connectivity in some counties. There were also technological challenges such as negative attitude towards internet use. It was further established that some Principals were uploading data from cyber cafes therefore compromising the authenticity and accuracy of the information (Ouma Wanzala, 2019).

The Kenyan government, through the ministry of ICT, developed an infrastructure-related policy to effectively ensure affordable and wide spread access to ICT services. It recognizes that without enabling infrastructure, all other components cannot exist (GOK, National Information and Communications Technology (ICT) Policy, 2016). Despite this policy, most government institutions, including secondary schools, have not been able to acquire ICT infrastructure that supports the use of EMIS.

Data security has also been compromised which is contrary to the ICT policy on data protection on confidentiality and integrity of citizen's information (GOK, National Information and Communications Technology (ICT) Policy, 2016). With the introduction of NEMIS in 2017, we still have cases of forged documentation in co-curricular competitions where people who are not students participate in games illegally as was noted by the Secretary General, Kenya Secondary School Sports Association (KSSSA) (Mativo, 2019). This depicts that NEMIS has not been fully adopted even within the MoE itself. According to the Secretary General KSSSA, the use of NEMIS will stem age cheating and impersonation because schools will be required to enter names of students they intend to field at any championship in the NEMIS before they can be allowed to compete.

An assessment of EMIS reveals that EMIS personnel at the national, regional, Sub-County and school level possess inadequate skills in use of ICT gadgets for use in EMIS. It further shows that technological investment, especially in ICT infrastructure for EMIS, is inadequate (Walekhwa D.W, 2016). This explains why the use of NEMIS in secondary schools has been a challenge. Data keyed in in an ICT gadget is as accurate and timely depending on how it was first captured, analyzed and stored by the first handler. This was evident on a report tabled in parliament by the outgoing Kenyan Cabinet Secretary MoE, Amb. Dr. Amina Mohamed, who listed duplication of birth certificate numbers and typing errors of birth entry numbers as some of the challenges the Ministry of Education had faced in data management (Oduor, Examination body wants birth certificates to be submitted afresh, 2019). If data is captured, analyzed and stored wrongly, then the use of an ICT gadget will not make it correct to be used for decision making in resource allocation. The introduction of NEMIS was well-thought-out as it captured the essential information on the staff and students of a particular school. However, the rollout of this program did not involve teachers. The question of who is supposed to key in data to the system and how was not factored in. This creates the need to assess the data capture, analysis and storage skills of data handlers who are mainly Principals.

According to (Augustine Oduor, 2019) there was a total of one hundred and seventy candidates in Elgeyo-Marakwet County whose KCSE 2019 registration was to be cancelled due to errors in birth certificate numbers. This shows that there is a problem in the quality of data provided by different stakeholders and data capture skills of those involved in registration of candidates which is likely to affect the use of NEMIS because the same people who register candidates are the same people who use NEMIS. Furthermore, in some secondary schools, Principals had not filled the Teacher Management Information System (TMIS) returns that uses almost the same procedure as the NEMIS system.

It is due to this reasons that the study intended to determine the level of preparedness of Principals of secondary schools in Keiyo North Sub-County in Elgeiyo-Marakwet County to adopt NEMIS in decision making for resource allocation in the management of their schools.

## Statement of the Problem

In Kenya, MOE has made huge investment in terms of material and human resource to develop NEMIS. As a tool, NEMIS is supposed to help reduce paperwork and the opacity that has defined the Ministry of Education for a very long time. The system needs to help amalgamate the separate data points in the sector by literally introducing a shelter for all critical components of data and information about the sector.

Despite the investment, the country has not had an effective use of Education Management Information System (EMIS) (GOK, Education Management Information System, Facilitator Guide for Training, 2009) This was evident in the use of NEMIS where most parents had challenges in downloading form one admission letters in the year 2019. Form one admission for the year 2019 was to be through the use of NEMIS with an objective of reinforcing efficiency of admissions, promotion of fairness and openness in order to prevent cartels from peddling admission letters (Ouma Wanzala, 2019). This, however, was not the case as it emerged that some Principals issued admission letters to parents even without due approvals through NEMIS (Oduor, Ministry eases admissions for 800,000 Form 1 students, 2020). Principals were to declare available slots in their schools through the NEMIS portal so as to ensure fairness across board, but this did not happen as expected. NEMIS was however faced with many challenges and even opposition as was witnessed in Nandi County where a section of county leaders called on the government to stop the process of admitting and registering learners through NEMIS (Chepcheng, 2019) Most secondary school Principals have not been able to upload the bio-data of students, teachers and support staff, while those who have tried are yet to complete filling all the data required onto the system.

In the year 2020, during admission of form one students, most head teachers resorted to enrolling students manually when the electronic system failed. Failure of NEMIS delayed the admission process, with schools in Vihiga County reporting having challenges using the online format. School managers had to use a manual list to continue with the enrolment uninterrupted. In Kakamega County, St. Peter's Boys High School Principal said that teachers would work overnight to transfer the students' information onto the system (NATION TEAM, 2020) Schools in Keiyo North Sub-County faces such challenges too.

This is a clear indication that there is a big problem with NEMIS, specifically in terms of internet connectivity that school managers (who happen to be Principals) and teachers have to burn the midnight oil to transfer information into the system which calls for the study to investigate on why adoption of NEMIS is facing challenges. There is need therefore to continuously evaluate the level of preparedness of secondary school Principals in adoption NEMIS.

## Objective of the Study

The study sought to pursue the following objectives:

    i.    To establish the impact of Principal's level of acceptance on the adoption of NEMIS in secondary schools in Keiyo North Sub-County

    ii.    To assess the effect of training and skills on the adoption of NEMIS in secondary schools in Keiyo North Sub-County.

    iii.    To establish the impact of adequacy of ICT infrastructure on the adoption of NEMIS in secondary schools in Keiyo North Sub-County.

## THEORETICAL AND CONCEPTUAL FRAMEWORK

### Theoretical Framework

The study was guided by the Unified Theory of Acceptance and Use of Technology (UTAUT) advanced by Viswanath Venkatesh. The theory attempts to explain the degree of acceptance of the use of information technology. It assesses whether the user will be able to accept the new technology and user's ability to deal with it. The theory answers one of the most critical questions: 'What are the user's attitudes towards accepting ICT solutions regardless of the level of available infrastructures and support administration?' (Viswanath Venkatesh, 2003)

The study is also based on the public choice theory advanced by James Buchanan, which analyses the government decision-making process to allocate resources. The theory considers how well the government performs in resource allocation. The basic principle of the theory is that leaders follow their own self-interest in resource allocation rather than promoting the best interest of society (Tucker, 1995) School managers need to allocate more financial resources in support of teacher training and ICT infrastructure in their schools in order to enhance adoption of NEMIS. The government therefore plays a key role in creating equity in resource allocation and, for the government to be efficient in resource allocation in a sector like education, correct and timely information is necessary. This is mainly facilitated by the use of NEMIS.

### Conceptual Framework

Use of EMIS in data capture, analysis, storage and usage requires a system that brings together three major components namely: Technology (ICT infrastructure), people (skills and attitudes) and processes (Kornkaew, 2012). According to (Yaser Hasan Al-Mamary, 2014) there are three main issues related to MIS adoption: they are technology, organization and people. Technological issues include: systems quality, information quality and service quality. Organizational issues include top management support and end-user training. On the other hand, people issues include computer self-efficiency and user experience. All these issues are important in the use of EMIS.

In this study, the influence of Principals' level of acceptance, training and skills and adequacy of ICT infrastructure on adoption of NEMIS were investigated. The study further investigated the relationship between Principals' level of acceptance, training and skills and ICT infrastructure and the adoption of NEMIS. For an education management information system to work, people with skills and the right attitude must use technology to capture raw data and analyze it by converting it to information which can be stored and used for better decision making in resource allocation. This leads to reduced wastage in education.

The researcher's own conceptual framework for this study is as illustrated in figure 2. In this figure, adoption of NEMIS stands out as a dependent variable. The independent variables are: level of acceptance on the use of new technology, training and skills in data handling and ICT infrastructure.

If the level of acceptance is high, Principals have training and skills and are competent on data handling and there is adequate ICT infrastructure that supports the use of NEMIS, then adoption of NEMIS will be faster. For Principals to perform their roles effectively, they require ICT

infrastructure and processes (procedures of data capture, analysis and storage). Processes on the other hand cannot be operational if there are no people with the right training, skills and attitudes. Technology is critical in the use of Education Management Information System but cannot replace skills and knowledge from people (Kornkaew, 2012). For technology to be used, it requires the right people with the right skills and knowledge.

**Independent Variables**                                **Dependent Variable**
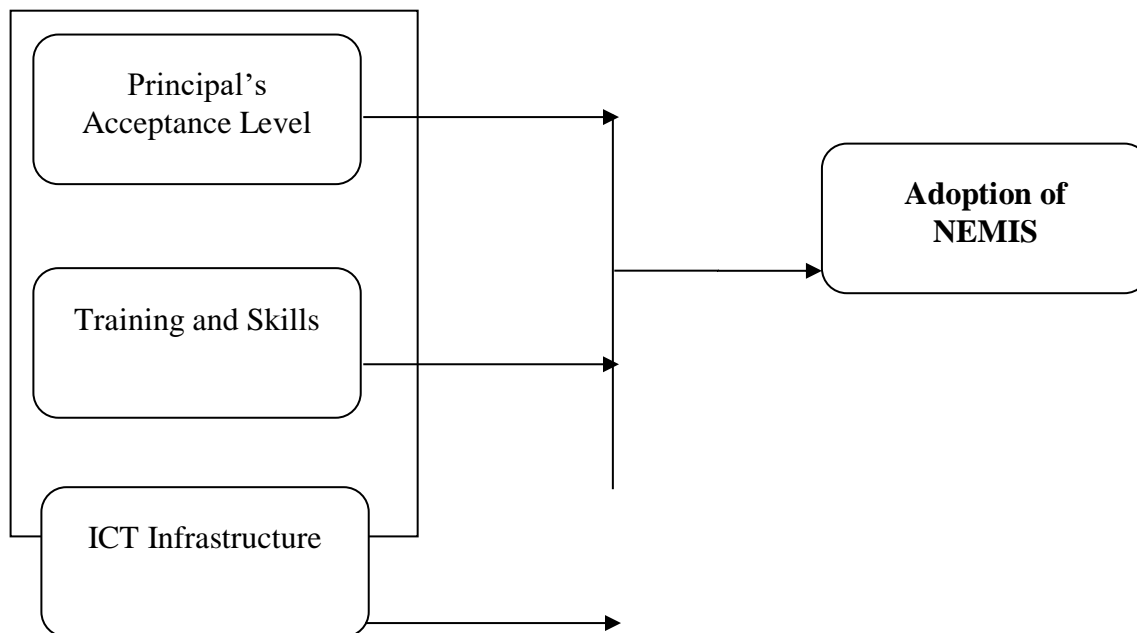
**Level of Preparedness**



Figure 2 Conceptual framework

## MATERIALS AND METHODS

### Research Design

This study used explanatory research design. It was relevant to this study for it sought to help understand more about adoption of NEMIS and offers better conclusion.

### Area of Study

Keiyo North Sub-County is found in Elgeiyo-Marakwet County which borders Baringo County to the East, Uasin-Gishu and Trans-Nzoia to the West and West Pokot to the North. Elgeiyo-Marakwet county has a total population of 369,998 with Keiyo North Sub-County having a population of 73,715 (Kenya County fact sheet, 2011). 60.8% of total roads are fair, with 5.7% being paved roads. The county has a population of 10.6% with secondary education and 71.3% with primary education. The county has an enrolment of 25,165 students in secondary school (Marakwet, 2013).

## Target Population

The Sub-County has a total of thirty secondary schools which comprises of one National school, three Extra-County schools, Four County and twenty-two Sub-County schools. The study used the population of one National, three Extra-County, four County and twenty-two Sub-County secondary schools' Principals and ICT teachers in Keiyo North sub-county of Elgeiyo-Marakwet County in Kenya. Thus, thirty (30) Principals and thirty (30) ICT teachers were targeted. This formed a target population of sixty (60).

## Sample size and Sampling procedure.

Schools were classified as National, Extra-County, County and Sub-County secondary schools. From these classes, the researcher, through the census method, picked all Principals and HODs in charge of ICT from Extra-County, County and Sub-County schools as well as a National school. This ensured that all the sub-groups were proportionately represented. This formed a population of 100% higher than the minimum of 20% as recommended by (Gay, 1996). This constituted a better representation of the target population.

**Table 1 Target population and Sample population**

|  | School | Target Population | Sample Population |
|---|---|---|---|
| Principals | National | 1 | 1 |
|  | Extra County | 3 | 3 |
|  | County | 4 | 4 |
|  | Sub-County | 22 | 22 |
| Total |  | 30 | 30 |
| HODs In Charge of ICT | National | 1 | 1 |
|  | Extra County | 3 | 3 |
|  | County | 4 | 4 |
|  | Sub-County | 22 | 22 |
| Total |  | 30 | 30 |
| **Grand Total** |  | **60** | **60** |

## Research Instruments

Data was collected by use of questionnaires which helped in collecting information over a short period of time. They are also suitable for literate population and information needed is easily described in writing.

## Questionnaires

The research project used two questionnaires, one for the Principal and the other for the HOD in charge of ICT. Questionnaires for Principals comprised of three parts: part one sought general information, part two was designed to capture information on level of acceptance on adoption of

NEMIS while part three captured information on training and skills on data handling. Those for HODs in charge of ICT comprised of three parts: part one sought general information, part two had information on ICT infrastructure and use while part three had information on adoption of NEMIS. The questions in the questionnaires were close-ended. Data was analyzed using SPSS and presented in form of tables.

**Validity Tests**

The instrument was pre-tested in a pilot study and this validation exercise was to confirm the adequacy and validity of the measurement scales. Both content validity of the instrument was tested. A content validity index of greater than 0.7 was obtained for all the variables studied and all matters raised by the experts and supervisors were addressed in the final instrument. The content validity results are as shown in the Table 2

**Table 2 Content Validity Index (CVI)**

| Variables | CVI |
|---|---|
| NEMIS adoption | .871 |
| Acceptance | .794 |
| Training and Skills | .960 |
| ICT Infrastructure | .801 |

**Reliability Test**

Cronbach's alpha reliability test was used to determine the internal consistency of the question items that measured the variables of interest for this study. For Principal's preparedness variables, the reliability test was done for the three constructs (acceptance level, training and skills, and ICT infrastructure). The same was done for adoption of NEMIS as the dependent variable. A benchmark of Cronbach's coefficient value of greater than 0.7 indicates the tool was reliable to measure the variable (Sekeran, 2000). Table 3 presents the results of the reliability test. From tabulated results in Table 3, alpha coefficient for all the variables were in the range .803 to .961, hence they are above the benchmark of 0.7 suggested by Saunders (2014). The scales were, thus, reliable for measuring the variables.

**Table 3 Cronbach's alpha Reliability coefficient**

| Variable | Constructs | No of items | Alpha |
|---|---|---|---|
| Principal's Preparedness | Acceptance Level | 10 | .961 |
| | Training and Skills | 5 | .803 |
| | ICT Infrastructure | 7 | .883 |
| Adoption of NEMIS | - | 6 | .952 |

## RESEARCH FINDINGS AND DISCUSSION

### Response Level

Although the study intended to collect data from 60 respondents, data was successfully collected from 48 respondents. This represented a response rate of 80% and falls within the confines of a large sample size (n ≥30). This response rate was deemed acceptable in accordance with recommendations that a response rate above 70% is excellent (Kothari, 2011). This provides a smaller margin of error and creates good precision (Malhotra, 2007).

### Profile of Respondents

The demographic profile of the surveyed respondents which includes gender, age, and education is presented in Table 4. The gender distribution of the survey respondents was 70.8% males and 29.2% females. This was interpreted to mean that the majority of managers of secondary schools in the Sub-County are male. For age, results indicated that 6.3% of respondents were below 30 years, 16.7% were in age bracket 31-40 years, 56.3% were between 41-50 years old and 20.8% are above 50 years.This indicated that the majority of the respondents were between 41-50 years. The respondents indicated that most of them (77.1%) had undergraduate level of education while 22.9% had postgraduate qualification.

**Table 4: Demographic Profile of the Respondents**

| Variable | Category | Frequency | Percentage |
|----------|----------|-----------|------------|
| Gender | Female | 14 | 29.2 |
| | Male | 34 | 70.8 |
| | Total | 48 | 100.0 |
| Age | Below 30 | 3 | 6.3 |
| | 31-40 years | 8 | 16.7 |
| | 41-50 years | 27 | 56.3 |
| | Above 50 years | 10 | 20.8 |
| | Total | 48 | 100.0 |
| Education | Postgraduate | 11 | 22.9 |
| | Degree | 37 | 77.1 |
| | Diploma | 0 | 0.0 |
| | Total | 48 | 100 |

### Descriptive Statistics of the Study Variables

Descriptive statistics of means, standard errors and standard deviation were obtained for the variables: acceptance level, training and skills, ICT infrastructure, and adoption of NEMIS.

### Principal's Acceptance

The descriptive statistics for the items of Principal's acceptance indicated that the means were in the range 2.10 to 2.56. This gave an overall mean of 2.43. On a 5-point Likert scale, the scores were slightly below average. The standard deviations were in the range 1.086 to 1.372. The overall

standard deviation for Principal's acceptance was 1.104 and it infers that 99.9% of the responses were spread within three standard deviation of the overall mean.

The relatively low standard deviation value indicates that the variability in the spread of the scores was low. The standard errors of the mean for the items measuring integrated approach were low indicating that the mean values for the items were reliable. The respondents scored highest in the aspect of 'All information on students is uploaded in the NEMIS' (A6). The item 'My institution has a functional internal NEMIS' (A1) item had the lowest mean of 2.10 which proves that most secondary schools don't have a functional internal NEMIS. The slightly below average mean of 2.43 on level of acceptance is proven when the Kenyan education Cabinet Secretary admitted that her ministry did not have an accurate and reliable database on the actual number of schools and students that can be relied on for decision making (Wanzala, Ministry abandons Nemis as it fails to capture pupil's data, 2019). A report submitted to the National Assembly in early 2019 showed that the system had captured only information on 50% of learners in public schools. According to the report presented by the Principal Secretary, only 6.8 million learners out of a possible 13 million had been captured (Wanzala, Ministry abandons Nemis as it fails to capture pupil's data, 2019). Principal's acceptance descriptive statistics are presented in Table 5.

**Table 5: Descriptive Statistics for Principal's Acceptance**

| Code | | Mean | | SD |
|---|---|---|---|---|
| | | Stat | SE | |
| A1 | My institution has a functional internal NEMIS | 2.10 | .198 | 1.372 |
| A2 | Uploading education data to NEMIS portal is easy | 2.47 | .188 | 1.304 |
| A3 | Using NEMIS enhances efficiency in management | 2.43 | .168 | 1.165 |
| A4 | NEMIS has enhanced admission of students | 2.52 | .197 | 1.368 |
| A5 | NEMIS has created fairness in admission of students | 2.43 | .168 | 1.165 |
| A6 | All information on students is uploaded in the NEMIS | 2.56 | .190 | 1.319 |
| A7 | Data on students is updated on the NEMIS portal | 2.39 | .156 | 1.086 |
| A8 | NEMIS uses easy procedures | 2.51 | .194 | 1.333 |
| A9 | I upload data in NEMIS portal without assistance. | 2.39 | .196 | 1.364 |
| A10 | Use of NEMIS has enabled quick access of data | 2.47 | .192 | 1.336 |

**Training and Skill**

Considering the variable training and skill, the mean as a measure of central tendency was found to be in the range 2.16 to 2.87 for the items measuring the variable. The overall mean for the variable training and skill was found to be 2.52. On a 5-point Likert scale. This meant that the respondents gave a slightly above average score. The values of standard deviations for training and skill were in the range 1.277 to 1.423 and the overall standard deviation was 1.007.

The relatively high standard deviation value indicates that the variability in the spread of the scores was high. For standard error of the mean, the values were low indicating that the mean values for the items were reliable. Inspection of the scores of each item measuring training and skill indicated

that the respondents scored highest in the item 'My institution invests in capacity building' (TS4) which posted a mean value of 2.87 with a standard deviation of 1.423. On the other hand, the item 'My training on data is adequate for use in NEMIS' (TS1) had the lowest mean of 2.16 with standard deviation of 1.277. This is a similar case of the study carried out by Jackson Muhia Waweru in Limuru Sub-County in Kiambu County, Kenya, where it was established that although the Sub-County Education Office staff had adequate computer literacy skills, the skills of Principals and HODs were inadequate, hence the need to have an in-service training. The descriptive statistics for training and skill are presented in Table 6.

**Table 6: Descriptive Statistics for Training and Skill**

| Code | | Mean | | SD |
|------|--|------|--|-----|
| | | Stat | SE | |
| TS1 | My training on data is adequate for use in NEMIS | 2.16 | .184 | 1.277 |
| TS2 | I regularly attend in-service training on data handling | 2.43 | .185 | 1.286 |
| TS3 | The Management supports training on data handling | 2.77 | .195 | 1.356 |
| TS4 | My institution invests in capacity building | 2.87 | .205 | 1.423 |
| TS5 | Training on data improves skills on the use of NEMIS | 2.35 | .200 | 1.391 |

**ICT Infrastructure**

Further, the descriptive statistics of measures of central tendency and measures of dispersion for all the items measuring ICT infrastructure were analyzed. The means for the items were in the range 2.08 to 3.04 and the attendant standard deviations in the range 1.165 to 1.486. The overall mean and standard deviation for the variable ICT infrastructure was 2.4077 and 1.028 respectively.

The low standard deviation value points at low variability in the responses for ICT infrastructure. The low mean standard errors meant the mean was reliable. The item 'Access to NEMIS portal within the school is fast' (IT4) had the highest mean value of 3.04 with a standard deviation of 1.486. While the item 'There are no technological challenges when using NEMIS' (IT7) had the lowest score with a mean of 2.08 and a standard deviation of 1.234. This is proven when the then Kenyan Cabinet Secretary in charge of Ministry of Education admitted that most secondary schools are still struggling with challenge of internet connectivity putting in mind that most secondary schools are located in remote areas that are not easily accessible. The Cabinet Secretary pointed out that slow internet connectivity in some Counties slowed the uploading of NEMIS data as far flung areas reported challenges in down time and slow connection. The same scenario is replicated in Keiyo North Sub-County. The results are presented in Table 7

**Table 7 Descriptive Statistics for ICT Infrastructure**

| Code | | Mean | SD |
|------|--|------|-----|

| | | Stat | SE | |
|---|---|---|---|---|
| IT1 | There are enough computers in my school for use in NEMIS | 2.10 | .198 | 1.372 |
| IT2 | We have modern computers for NEMIS use | 2.47 | .188 | 1.304 |
| IT3 | Retrieval of data through NEMIS is fast | 2.43 | .168 | 1.165 |
| IT4 | Access to NEMIS portal within the school is fast | 3.04 | .214 | 1.486 |
| IT5 | I always upload NEMIS data within the school | 2.37 | .180 | 1.248 |
| IT6 | Uploading data on the NEMIS portal takes short time | 2.33 | .196 | 1.357 |
| IT7 | There are no technological challenges when using NEMIS | 2.08 | .178 | 1.234 |

## Adoption of NEMIS

The descriptive statistics for all the six items measuring NEMIS adoption were obtained. The mean values and the accompanying standard deviations were in the range 2.10 to 2.52 and 1.165 to 1.372 respectively. The analysis further indicated that the overall mean for the items measuring NEMIS adoption was 2.409. Standard deviation as a measure of the spread of the scores had an overall value of 1.151. This indicated a moderate spread of the values measuring NEMIS adoption as a variable. The standard errors were low and hence it was concluded that the mean values obtained for all the items and the overall mean were reliable. The slightly below overall mean of 2.409 concurs with the findings of a study carried out by Okewa James in Kisumu County Kenya (Juma, 2011) where it was established that information communication technology have been adopted to some extend and more needed to be done to address challenges that have remained thorny like lack of finances, lack of ICT implementation plan and lack of technical personnel. The Descriptive statistics are presented in Table 8.

## Table 8: Descriptive Statistics for NEMIS adoption

| Code | | Mean | | SD |
|---|---|---|---|---|
| | | Stat | SE | Stat |
| AD1 | Student data is readily available in NEMIS | 2.10 | .198 | 1.372 |
| AD2 | NEMIS is a one-stop-shop for student data | 2.47 | .188 | 1.304 |
| AD3 | All relevant information for students is uploaded in NEMIS | 2.43 | .168 | 1.165 |
| AD4 | NEMIS has enabled us have efficient student data handling | 2.52 | .197 | 1.368 |
| AD5 | The school has confidence in the NEMIS system | 2.43 | .168 | 1.165 |
| AD6 | Retrieval of data through NEMIS is fast | 2.47 | .188 | 1.304 |

## Regression Results

The study sought to investigate the effect of Principal's level of preparedness on adoption of NEMIS in secondary schools in Keiyo North Sub-County, Elgeyo-Marakwet County. This section of the analysis involved investigating the effects of the independent variables (acceptance level, training and skills, and ICT infrastructure) on adoption of NEMIS and its direct effects.

The first hypothesis ($H_{01}$) stated that Principal's acceptance level has no significant effect on adoption of NEMIS in secondary schools in Keiyo North Sub-County, Kenya. The results of the regression analysis suggested that Principal's acceptance level had a positive significant effect on

NEMIS adoption ($\beta$= .603, p<0.05). Hence the hypothesis is not supported. The value of the F-statistic showed that the model was robust enough to be used to explain the relationship between the variables (F=221.162, p<0.05). The findings suggest that as the level of Principal's acceptance increases, so does the NEMIS adoption improve in tandem. The results are presented in Table 9.

The second hypothesis ($H_{02}$) stated that training and skills has no significant effect on adoption of NEMIS in secondary schools in Keiyo North Sub-County, Kenya. Regression results indicated that training and skills had a positive significant effect on NEMIS adoption ($\beta$= .186, p<0.05). Hence the hypothesis was rejected. The findings suggest that as training and skills are enhanced, the adoption of NEMIS improves.

The third hypothesis, ($H_{03}$), stated that ICT infrastructure has no statistically significant effect on adoption of NEMIS in secondary schools in Keiyo North Sub-County, Kenya. Regression results as captured in Table 9 indicated that ICT infrastructure had a positive significant effect on NEMIS adoption ($\beta$= .293, p<0.05). This meant that ICT infrastructure enhances adoption of NEMIS. From these deductions, it can be noted that developing a working EMIS requires good internet connectivity, well trained human resource, positive attitude towards EMIS and commitment by those in authority (Trucano, 2006). The multiple regression results for the set hypotheses ($H_{01}$, $H_{02}$, and $H_{03}$) are summarized in Table 10

**Table 9 Multiple Regression Results**

|  | Likelihood of OVCs |
| --- | --- |
| Constant | -.229(.121) |
| Acceptance | .603(.116)* |
| Training and Skills | .186(.089)* |
| ICT infrastructure | .293(.102)* |
| F-Statistic | 221.162 |
| R | .968 |
| $R^2$ | .938 |
| Adj. $R^2$ | .934 |
| Durbin-Watson | 1.932 |

Values of standardized regression coefficients, with standard errors in parenthesis while *p <0.05 indicates the value is significant at 95%.The coefficient of determination value of $R^2$= .938 means that 93.8% of the variation in NEMIS adoption can be explained by acceptance level, training and skills and ICT infrastructure combined.

Hence, from the results in Table 9, the following model was constructed:

$Y = -.229 + .603X_1 + .186X_2 + .293X_3$

Where:

Y = Adoption of NEMIS

$X_1$ = Acceptance Level

$X_2$ = Training and Skills

$X_3$ = ICT infrastructure

From the model above, it can be noted that there is a positive correlation between the dependent variable adoption of NEMIS and the independent variables; any one of the independent variables namely acceptance level, training and skills and ICT infrastructure affects the dependent variable. If the acceptance level, training and skills of Principals are high and there is adequate ICT infrastructure in secondary schools, adoption of NEMIS will be faster. On the contrary, adoption of NEMIS will also be slow if they are low. It is also important to note that there is a strong relationship between the acceptance level and adoption of NEMIS than the other variables. It can therefore be deduced that acceptance level is very important in determining adoption of NEMIS and that for NEMIS to be adopted faster, then Principals' level of acceptance must be raised. This can be done through attitude change.

**Table 10: Summary of the Hypotheses Tests Results**

| Statements | | Results |
|---|---|---|
| **Ho$_1$**: | Acceptance level has no statistically significant effect on adoption of NEMIS in secondary schools in Keiyo North, Kenya. | Rejected H$_0$ |
| **Ho$_2$**: | Training and skills has no statistically significant effect on adoption of NEMIS in secondary school in Keiyo North, Kenya. | Rejected H$_0$ |
| **Ho$_3$**: | ICT Infrastructure has no statistically significant effect on adoption of NEMIS in secondary school in Keiyo North, Kenya. | Rejected H$_0$ |

## SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

### Summary

The study sought to establish the effect of Principal's level of preparedness on adoption of NEMIS in secondary schools in Keiyo North Sub-County, Elgeiyo-Marakwet County in Kenya. It used an explanatory research design that was quantitative in nature and targeted the Principals in secondary schools and HODs in ICT department. A total of 60 questionnaires were distributed to the respondents and 48 were filled and returned. This gave a response rate of 80%. Descriptive statistics of frequencies, percentages, mean, standard deviation, and standard error were used to summarize the data and draw vital conclusions. Inferential statistics of correlation and multiple regression were used to establish the relationship between Principal's level of preparedness and adoption of NEMIS in secondary schools in Keiyo North Sub-County, Elgeyo-Marakwet County, Kenya.

Correlation analysis results indicated that the sub-variables of Principal's level of preparedness (level of acceptance, training and skills and ICT infrastructure) positively and significantly correlated with adoption of NEMIS in secondary schools in Keiyo North Sub-County, Elgeiyo-Marakwet County, Kenya.

Multiple regression results, as guided by the objectives and the attendant hypotheses, indicated that the Principal's level of acceptance, training and skills and ICT infrastructure had a positive and significant effect on adoption of NEMIS. The coefficient of determination ($R^2 = .938$) indicated that 93.8 % of adoption of NEMIS can be explained by acceptance, training and skills and ICT infrastructure combined. This proves the fact that an EMIS requires technological infrastructure which includes computers, internet and intranet and telephone lines among other information communication technology gargets so as to perform its role effectively (Muhia, 2016). It also requires people with skills and right attitudes combined with correct processes.

## Conclusions

A number of conclusions were drawn from the results of this study. First, from the correlation results, the constructs of Principal's level of preparedness positively and significantly correlated with adoption of NEMIS. It was therefore concluded that as acceptance, training and skill and ICT infrastructure are enhanced, adoption of NEMIS receives a positive boost.

As per regression results for testing the first hypothesis indicated, acceptance had a statistically significant effect on adoption of NEMIS in secondary schools in Keiyo North Sub-County, Elgeiyo-Marakwet County, Kenya. The study concluded that for adoption of NEMIS to succeed, Principals should be prepared to accept it. The higher the level of acceptance, it was noted, the greater the adoption of NEMIS.

Considering the second objective of the study and the results of the second null hypothesis, the study indicated that training and skills had a statistically significant positive effect on adoption of NEMIS in secondary schools in Elgeiyo-Marakwet County, Kenya. It was therefore concluded that the training of Principals on NEMIS-related technologies and hence equipping them with relevant skill-set on the same aided the adoption on NEMIS in the schools under study.

Further, in line with the set third objective, the results for the third hypothesis tested showed a statistically significant and positive effect of ICT infrastructure on adoption of NEMIS in secondary schools in Keiyo North Sub-County, Elgeiyo-Marakwet County, Kenya. The conclusion drawn was that having the requisite ICT infrastructure in the schools enhanced the adoption of NEMIS.

## Recommendations

From the conclusions of this study, several recommendations for theory, management practice and policy and further research are drawn.

## Theoretical and Practical Implications

The present study has both theoretical and practical implications. Managers will also find some useful implications that are relevant and can be applied in designing the strategies for effective NEMIS adoption.

## Theoretical Implications

This study has provided empirical evidence for the development of the existing body of knowledge in the fields of adoption of NEMIS technology in the management of student data. It has provided empirical support to Unified Theory of Acceptance and Use of Technology tenets. The conclusion from the study that use of technology is a function of acceptance by the user is in line with the

postulates of UTAUT theory that drove this study. It is therefore recommended that managers in the education circles should pay greater attention to the postulates of UTAUT theory for effective implantation of ICT driven programs like NEMIS. The study further points out that for any government policy to succeed, those in authority should allocate resources for public interest to support such policy rather than follow their own self-interest as pointed out by the public choice theory.

**Management Practice and Policy Implications**

This study suggests the quintessential role of Principals' level of preparedness in adoption of NEMIS. The three-fold approach of having Principals who are ready to accept NEMIS, have the necessary training and skills for NEMIS and are supported by the requisite ICT infrastructure should be leveraged on to have the desired compounding effect on adoption of NEMIS in schools. Hence, there is need to have policies in place for training the managers of schools in NEMIS related technologies.

**Areas for Further Research**

There is need for a study on the mediating or moderating role of age and gender of the Principal on the relationship between Principals' level of preparedness and adoption of NEMIS.

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