

# PRINCIPALS' INFORMATION SYSTEMS' UTILIZATION ON MANAGEMENT OF COMMUNICATION IN PUBLIC SECONDARY SCHOOLS IN NYAMIRA COUNTY, KENYA

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**Abstract:** The smooth running of institutions of learning depends on the quality of communication. Poor management of communication in these institutions contributes a great extent; to the provision of poor quality services, hence low quality education. This paper argues that the methods employed in the management of communication should take into consideration the paradigm shift in global communication trends. The purpose of this study is to establish the utilization of 'Information Systems' (IS) on communications in public secondary schools in Nyamira County. A survey design and mixed method approach were used in the study and a questionnaire was the main tool for collection of data. The target population was 182 principals of public secondary schools distributed in 5 sub-counties. Stratified random sampling technique was used to obtain a sample of 80 principals. This questionnaire was utilized to obtain information from the principals. The data collected was analyzed using Analysis of Variance (ANOVA). The findings of the study show that Website and e-mail were found to be the main channels of communication from schools to education headquarters and has greatly reduced the cost of incurred in the process. It was found that Information Systems utilization has a direct relationship with its outcomes on management of public secondary and communication.

**Keywords:** Information systems, management, communication, utilization.

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## 1. INTRODUCTION

Communication which is a driver of curriculum implementation and supervision means to make known, to impact or to transmit information and it forms a bridge between principals, teachers, and education officials since principals must receive and give ideas, reports and instructions, explain problems and give the demonstration (Kirimi, 2013). Nduta (2014) noted that communication with employees is important even in small organizations in order to keep them informed about new products, customer wins, important appointments, and any new business opportunities.

Prudent finance management, effective curriculum implementation and supervision and communication, are key to quality education provision. This means that the traditional methods of school management and administration are insufficient in enhancing quality in educational institutions (Okon, Akpan & Ukpong, 2011). New knowledge and skills are thus imperative in improving efficiency. Information Systems (IS) is thus a tool for use in the information and data gathering, and analysis in public secondary schools in the 21<sup>st</sup> century (Makera, Meremo, Role, and Role, 2013). IS refers to the

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telecommunications (telephone lines and wireless signals). It, therefore, means that they encompass; computers and enterprise software, middleware, storage and audio-visual systems that transmit, access, store and manipulate information (FOLDOC, 2013). In this study IS refers to e-mail, computer software, SMS, e-learning and information management systems whereas, DVDs, internet, projectors, computers (laptop, mobile phones, and Desk Tops) are infrastructures that enable IS to work.

E-mail and computer software were used in education in the United States of America, and the United Kingdom, mainly to process information on personnel, and to link local and central education administration offices (Castels, 1996 & Twining, 2002). Spectrum Community Secondary School in Britain, installed computer system that had administrators' APPLE Package consisting of attendance periods for students and teachers, and demographic aid for textbooks, and for monitoring, and this proved very useful (Simair, 2006). Computers and DVDs for instance can be used in keeping students and various administration resources records (Maki, 2008 & Makera, Maremo, Role, E and Role, J, 2013).

In Kenya, various policies such as the e-government, e-learning and teaching, and IS for educational management of information systems (EMIS), have been developed (Siele, 2006). GOK (2008) through Sessional paper No.1 of 2005 introduced 'Education Management Information Systems' (EMIS) policy in education which was to improve access to education and decision making leading to quality education. Similarly, Sessional paper No.10 of 2012, introduced 'Science, Technology and Innovation' (STI) policy whose aim was similar.

Equally, The Kenya National Examination Council (KNEC) has developed online registration of (KCSE) and (KCPE) candidates' policy and this compels school principals and head teachers to use the internet for this service. Although the government has introduced Information Systems policies, Oloo (2009) found out that 42.9% of the schools had computers, with national schools having better facilities than county and sub-county ones. Similarly, a study by Ocharo, *et al* (2015) observes that most principals in schools have computers in their offices making easy it for IS utilization. Onderi and Makori (2013) opines that schools in this area have inadequate human and physical facilities, whereas, schools with adequate facilities perform better than those with inadequate ones in national examinations. According to Kaguri, Ibanu, and Thiaine (2014), it is because of careless financial and budgeting, poor financial reports and arbitrary auditing process. The studies by Makori and Onderi (2013) and Kaguri, Ibanu and Thiaine (2014) indicate the inadequacy of facilities and inefficient financial management in public secondary schools. This thus underscores the need for the introduction of new skills in management, where IS may be the option for utilization in the management of public secondary schools in Nyamira County, Kenya.

**Statement of the Problem:**

Poor management of public secondary schools is a recipe of the provision of poor quality education; thus depriving society of the much needed manpower to drive the economy towards the achievement of Sustainable Development Goals (SDGs) and Vision 2030. The inability of public secondary school principals to effectively manage finance, communication, implement and supervise curriculum; and provision of adequate learning resources is of great concern (Wangui & Miriti, 2014). Consequently, the principals need new ideas that may assist to boost their administrative efficiency. It is on this basis that; Meziobi (2006), opined that 'Information Systems' (IS) may be a tool that can be employed to address these challenges and boost the principals' ability to manage finance, implement and supervise curriculum, improve communication and supplement the provision of inadequate learning resources. Since most principals in Nyamira County have computers in their offices, it is easy to implement utilization of information systems, (Ocharo *et al*, 2015). Utilization of 'Information Systems' comes in hand to address these challenges because of our country (Kenya), hinges the achievement of the Sustainable Development Goals (SDGs) and Vision 2030 on technology. Therefore, the present study seeks to establish the utilization of 'Information Systems' on management of public secondary schools in Nyamira County, Kenya.

**Conceptual framework:**

Information systems such as e-mail, SMS, Website, and IMS as independent variables, bring efficiency in school finance management, communication, curriculum implementation and supervision

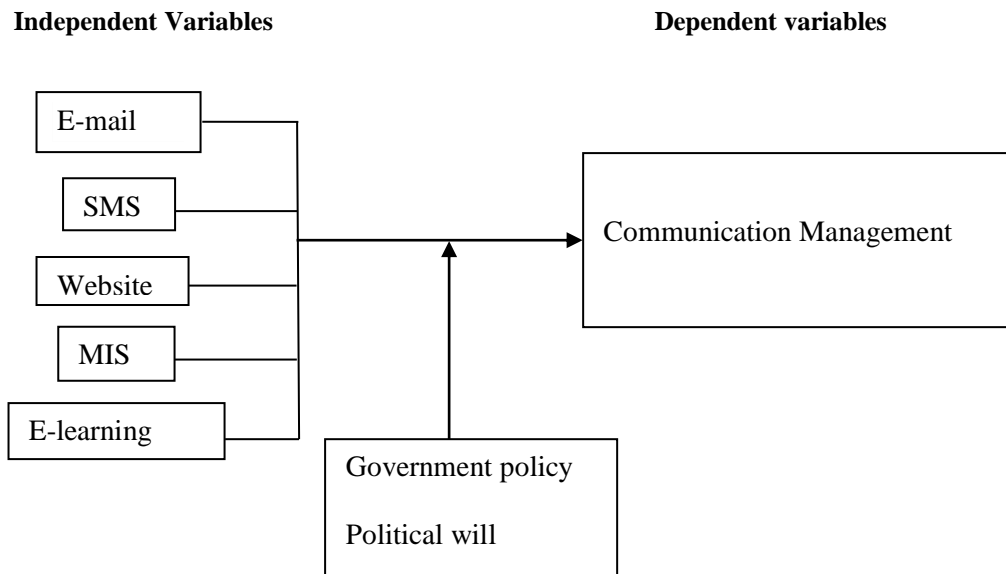


Figure 1.1: Conceptual Framework

This conceptual framework shows how the independent and dependent variables relate to each other in the study. The independent variables; e-mail, SMS, website, MIS, and e-learning are expected to positively influence the dependent variables; finance management, curriculum implementation and supervision; and communication to bring efficiency and effectiveness in public secondary school management.

## 2. LITERATURE REVIEW

### Utilization of information systems on management of communication in public schools:

Institutions are made up of more than one department and therefore there should be a good and efficient communication network within to interconnect these departments so as to enable a smooth flow of information. King and Godwin (2002) argue that for institutions involved in learning, parents must take part in shaping their children behavior by always encouraging and motivating the children to develop a positive attitude towards school, good classroom conduct and self-esteem and this can only be achieved through effective communication. Armstrong (2009) agrees with Ling and Godwin that effective communication is vital in running of institutional programs. Any change in an organization such as contingent pay, working methods, technology, and services need to be known by employees; and therefore effective communication will help improve relationship at work, teamwork, decision making and problem-solving techniques amongst the employees (Robinson and Judge, 2007). Lack of effective communication, therefore, will lead to poor quality education resulting in graduates who cannot deliver quality services. A study on the influence of communication channels on management practices in Kenyan Public Universities revealed that MMUST relies on HODs, Group representations, memos, notice boards, face to face and telephone to communicate (Namasaka, et al (2013). While, Mutua (2014) said that Newspapers, radio, and Telephones are important channels for communication with customers, investors and the community during product launching because they reach a larger target market, however, with increasing digitalization these channels are increasingly being rarely used.

Communication within an organization is very important and when it is effective, it enables constructive teamwork, since colleagues understand the way that communication is done and they feel recognized (Njiru, 2015). Nakpodia (2010) argued that communication within the school enhances discipline and maintains law and order. A study by Odhiambo (2005) found that Principals used school assemblies, staff meetings, HODs, memos, staff reports and consultations to communicate within the school, however, the channels are prone to distortion due language barriers and absenteeism on the part of the recipients thus they become inadequate in conveying messages to the recipients. Similarly, Kiriago (2013) found that when oral communication was used by students, administrators, HODs, teachers and support staff to communicate to their external target audience, there is a high tendency of people to forget too fast. However, it has been observed that technology such as the internet has improved communication as it enables users to access news, search for information, plan and book vacations and even buy households from home (Kefalaki, 2012).

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One of the common challenges of communication is failing to communicate the deliberations of meetings with staff in the time leading to information failure or late communication ( Mamuli, Mustosto, Namasaka and Odera, 2013).It is also noted that ‘Top-down’ communication affect organization cohesion as employees don't feel that their supervisor interact with them enough or communicate reliable information about the organization to them (Njuru, 2015).Effective communications within the institutions thus serve as a driving force behind successful activities hence there is need for every organization to embrace the utilization of good channels of communication. Management information systems therefore provide information to administrators and the teachers for informed planning, policy making and evaluation (Madiha, 2014). It is such an important tool for management of schools as teachers and other members of staff can sign in online as they come and leave school. Management information systems are utilized on tracking students who have defaulted on fee payment (Benwari, 2014).

Information Systems, need structures which will enable them to work. Kamile (2006) opined that the number of computers, computers connected to the internet, their location; and software used in schools are part of the important facilities for utilization of ‘Information Systems’ in schools. Although Information Systems have proved so vital in public secondary school management, not all schools have utilized the technology. Aduwa-Ogiegbaen and Iyam (2005) argue that lack of appropriate software which was culturally suitable to Nigeria was a stumbling block to technology adoption. This finding was different from that of Kamile(2006), that found that school principals’ perceptions about IS, determined the level of their utilization. While Mingaine (2013) argued that: in Kenya, the challenges of IS implementation were due to limited qualified teachers and high cost of infrastructure. On the other hand, Shah (2014) opined that management information systems (MIS) utilization was impeded by administrators’ lack of time, skills, and technical support. Kimbo, Gakuu, and Nderito (n.d) study in selected schools in Kenya, concurred with shah that lack of skills in ‘Information Systems’, prevented school managers from utilizing the technology.

Short Message Service (SMS) is a household name common in almost all mobile phone users, and as reported by Queensland Government (2013),its’ civil servants even use government network in their departmental offices to communicate to friends, family members, do online banking or pay bill, access breaking news and other online media site. Carke(2015) said that in New Zealand, most schools use SMS to capture achievement data and parents are given report using the stored information and standard templates in SMS. This SMS technology has had a wide application in Tanzanian education sector where rural schools uses mobile network to send Education Management Information System(EMIS) and other statistical data via SMS to Ministry of Education and Vocational Training(MoEVT).

Traxler and Dearden (n.d) say that these returns are used by ministry officials in sub-Saharan Africa in allocating resources, however, their transmission process currently used by letter-post, courier or by phone conversation is slow, expensive and error prone and most are stored and never used. SMS has been used in notifying students about changes in the timetables and sending bulk learning material resources in the rural areas in the United Kingdom (UK) (Nix, Russel, and Keagan, n.d). Obrien (2015) observed that parents want curriculum description and instructional programs, calendar of events and meetings, information on students safety(quality of teaching and educational program changes) communicated through e-mail, website, SMS, and voice messaging.

Queensland, government officials use SMS from their departments for personal use in communicating with friends, family members, and, for online banking and paying bills; but in New Zealand, most schools use it to capture achievement data of students which are then sent to parent from stored information and standard templates. In Tanzania, the SMS is used to send EMIS to the MoEVT headquarters whereas in Nyamira North Sub-county the studies did not reveal SMS usage. The study also found that there was low-level computer implementation prompting usage of SMS as it has a high acceptability, coverage, ownership among teachers and is socially inclusive (Traxler and Dearden,n.d).

Sunday and Oni (2012) found that Nigerian school administration used, e-mail to send and receive, bulk information to and from parents and other stakeholders and receive and send information on students, staff, and materials to and from government and other agencies. Cynon (n,d) said that schools and colleges use the website to advertise for places and students and parents apply through the website. Whereas management information systems are used in the offices to store data on students and personnel (Shah, 2014),

Shih and Kin(2003) argued that currently distance learning is primarily limited to colleges and corporate training secondary and elementary schools have not adopted it due to limitations of network infrastructure, experiences, manpower, effective policy and acceptance from the employees.

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Zajicova(2007) said that e-learning encompasses computer learning, internet resources and educational websites offering worksheets and interactive exercises for children. Questions can be answered online and can answer emergency questions at any time. E-learning courses will help teachers and offer new ideas to make their lessons more attractive for their students and thus make them more active during the lesson. A study by Kiilu (2012) in Kitui County, which examined E-readiness implications of e-adoption in Kenya, found that 10% of secondary schools offer computer studies which are an indicator of e-readiness. However, another study by Muluva and Kyalo(2013), on relationship between principals' teachers' and students' attitude towards e-learning adoption in curriculum implementation, using cross-sectional survey research design found that the students' attitude had significant influence on schools' readiness to adopt e-learning

**3. RESEARCH METHODOLOGY****Research design:**

This study employed survey design. This is a design which involves a brief interview and collection of information or data in its original form. The design is able to collect views from a large population using a single questionnaire (Cresswell & Plano, 2011). This method was appropriate in this study to gather a lot of information on 'Information Systems' utilization using a questionnaire from the many sparsely populated schools within a short time. The researcher thereafter used 'Structured in-depth interview schedule' to collect more information on the utilization of information systems from two key informants (principals of the two national schools). A mixture of quantitative and qualitative mixed method approach (paradigm) was suitable for this study as opined by Cresswell and Plano (2007) that Mixed Method Design methodology provides a better understanding which either method cannot. The researcher thus administered 80 principals' questionnaires and 217 HODs' questionnaires in 80 public secondary schools in Nyamira County, Kenya.

In Mixed methods approach, the researcher based the inquiry on the assumption that collecting diverse types of data, best provided an understanding of a research problem as it brought with it, abroad survey in order to generalize results to the population and then focused, in a second phase, the researcher concentrated on detailed qualitative structured interviews on the key informants to collect detailed views from participants an idea shared by (Creswell, 2003).

**Study area:**

The area of study was Nyamira County, Kenya. It is found in Nyanza region, bordering Bomet County, Kisii County, Homabay County and Kericho to the North Nyamira County lies between latitude 0030' and 00 45' south and between longitude 340 45' and 350 00' east and it has 182 secondary schools which are a large number, from where a representative sample was obtained. Each category of schools was fairly homogenous categorized into national, county and sub-county. The county had most of its parts with a fair distribution of electricity which makes computer utilization and implementation possible. The area is widely covered by the Airtel and Safaricom mobile and internet network making every home accessible to mobile and internet usage. Therefore it was suitable for this study due to the presence of network and electricity which are the basic factors determining the usage of information systems.

**Study population:**

The population of the study was drawn from 182 public secondary schools distributed in the five sub-counties of Nyamira County i.e. Nyamira North 54, Manga 28, Borabu 21, Nyamira South 47 and Masaba North 32. The schools are stratified as National schools (2), County schools (24) and Sub-county schools (156). The respondents were 182 principals, and 400 HODs who were distributed as 2 National schools (16 HODs), 24 County schools with 3 HODs each (72 HODs), and 156 Sub-county schools with 2 HODs each to make a total of 312 HODs

**Sample size and sampling procedures:**

The sample size was obtained using Proportionate Stratified Random Sampling method. Mwangi (2015) said that this method involves the division of a population into strata with members sharing similar characters and then obtaining a random sample from each stratum that is proportional to the stratum's size as relates to the population.

The sample size was obtained using Willen (2013)' table 3.1. The margin of error for this study- that is the deviation between the opinions of the respondents and the entire population was 5% and the confidence level 95%. The total number of respondents for the study was 302 who have distributed thus: 2 national schools each contributing 8 HODs making a total of 16, county schools number is 24, each contributing 3 HODs making a total of 72 HODs. The county and

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national schools sample HODs were selected by purposive sampling technique. is a type of non-probability sampling method that relies on data collection from members who are conveniently available to participate in the study. It is advantageous because it is easy to sample respondents, data collection can be facilitated in a short duration of times and it is cost effective (Trochim, 2008).

The number of HODs who participated in the study was obtained from Willem’s table proportionately; where a population of 500 contributed a sample of 217 at 95% confidence level. Since 400 is not in the table, it was taken to be nearer 500 than 100, thus a sample of 217 HODs was taken for the study

**Table 3.1: Willem’s 2013 sample size selection and confidence levels table**

Population	Confidence level=95% margin of error			Confidence level=99% Margin of error		
	5%	2.5%	1%	5%	2.5%	1%
100	80	94	99	87	96	99
500	217	377	475	285	421	485
1000	278	606	906	399	727	943
10 000	370	1332	4899	622	2098	6239
100 000	383	1513	8702	659	2585	14227
500 000	384	1532	9423	663	2640	16055
1000 000	384	1534	9512	663	2647	16317

Once the schools had been sampled and the number of HODs determined, the schools from which the sample of HODs was selected, were obtained by simple random sampling at each sub-county.

**Methods of Data Analysis:**

The data was collected using questionnaires and in-depth interview schedule. The questionnaires containing data from the respondents were coded and edited to ensure completeness and consistency. The items in the questionnaire were divided into; demographic, general and specific IS utilization. Demographic data the analyzed using descriptive statistics, while general and Specific IS utilization data in Objective one; two and three were analyzed using one-way Analysis of Variance (ANOVA). Objective four was analyzed using regression. ANOVA is a statistical test which analyzes variance and it is helpful in analyzing two or more population means which enables a researcher to draw conclusions on various results and predictions about two or more sets of data (Howell, 2010). This method was appropriate in the analysis of this research data, for it considered data from sub county, county and national schools from public secondary schools in Nyamira County which formed three independent groups.

**Ethical considerations:**

The principals and HODs were invited to participate voluntarily, with a clear understanding that they were under no obligation to do so and that there were no negative consequences for them if they did not assist in the research. They were also assured that all the responses given would be treated with confidentiality and anonymity.

All the HODs and principals involved the in researches were made fully aware of what they were being asked to do and any potential negative consequences of their participation were explained before the exercise began.

**4. RESULTTS**

**Utilization of Information Systems on Management of Communication:**

Communication in schools enables activities to be carried as and when required. Some communications are top-down, down-up and others horizontal; but all function to bring order to the school. The study investigated and answered the question:

How are IS utilized on the management of communication between sub county, county and national public secondary schools in Nyamira county, Kenya?

**Utilization of Information System on Communication by Principals:**

This information was sought in order to establish the type of IS and how they are utilized in public secondary schools in Nyamira County, Kenya. The study first determined the type of information systems using descriptive statistics. The

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second part of the study involved analysis of variance to determine the significance of the difference in IS utilization and then hypothesis testing. The data was further subjected to post hoc HSD analysis to identify the differences in levels of IS utilization between sub county, county, and national public secondary schools.

**Information System Utilization on Communication by Principals:**

The study sought from the questionnaire to find out the type of information systems utilized by principals on the management of communication in public secondary schools in Nyamira County. The results are illustrated in the form of frequencies and percentages in Table 4.23.

**Table 4.1: Information Systems General Utilization on Communication by Principals**

Information Systems	No. of schools	%	No of on users of schools	%
E-mail	20	<b>25.0</b>	60	<b>75.0</b>
MIS	18	<b>22.5</b>	62	<b>77.5</b>
SMS	61	<b>76.3</b>	19	<b>24.7</b>
Website	39	<b>48.8</b>	41	<b>51.2</b>

**N=80**

Data in Table 4.1 shows that Principals’ utilization of SMS was 61 (76.3 %) compared to e-mail 20 (25.0%) and MIS 18 (22.5%) respectively. SMS utilization is important especially in calling for meetings because it is faster, cheaper and convenient to communicate as the communicated information can be retraced for reference. SMS is applicable in all forms of communication vertical, horizontal and diagonal communication. E-mails and MIS were minimally utilized because their ease of use is limited due to accessibility factors. This was further investigated using the 3<sup>rd</sup> null hypothesis at  $p < .05$  statistical significance levels;

H0: There is no significant difference in the utilization of IS on the management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.

**Information Systems Utilization on Communication by Principals**

The study sought to find out the type of information systems utilized by principals in managing the communication process in their schools. The investigation was conducted from general to specific areas of information systems utilization.

**Significance of Difference Analysis of Information Systems General Utilization on Communication by Principals**

Analysis of significance of difference was conducted to establish the type of information systems utilized on the management of communication in sub county, county, and national public secondary schools. The results are illustrated in the form of frequencies and percentages in Table 4.1.

**Table 4.2: Significance of Difference Analysis of Information Systems General Utilization on Management of Communication by Principals**

		Sum of Squares	df	Mean Square	F	Sig.
com mis	Between Groups	51.580	2	25.790	<b>6.683</b>	<b>.002</b>
	Within Groups	297.170	77	3.859		
	Total	348.750	79			
Com-e-mail	Between Groups	40.755	2	20.377	<b>7.875</b>	<b>.001</b>
	Within Groups	199.245	77	2.588		
	Total	240.000	79			
Com sms	Between Groups	81.428	2	40.714	<b>64.031</b>	<b>.000</b>
	Within Groups	48.960	77	.636		
	Total	130.387	79			
Com webs	Between Groups	38.742	2	19.371	<b>36.197</b>	<b>.000</b>
	Within Groups	41.208	77	.535		
	Total	79.950	79			

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In Table 4.2, analysis of variance was conducted to test for significance of differences in MIS, SMS, e-mail, e-learning and website utilization on curriculum implementation in public secondary schools in Nyamira County. It was established that there is a statistical significant difference at  $p < .002$  in MIS utilization,  $MIS F(2, 77) = 6.683$ , at  $p < .001$  for e-mail utilization,  $e-mail F(2, 77) = 7.875$ , at  $p < .000$  for SMS and website utilization on communication. Since  $p < .002$ ,  $p < .000$  and  $p < .001$  are less than  $p < .05$ , the null hypothesis is rejected: 'There is no significance difference in IS utilization on the management of communication in public secondary schools in Nyamira County, Kenya.' Therefore, the alternative hypothesis is accepted; 'There is a significant difference in IS utilization on the management of communication in public secondary schools in Nyamira County, Kenya.' Thus the data has revealed that MIS e-mail, website, and e-learning are utilized on the management of communication, but their utilization varies between sub county, county and national public secondary schools in Nyamira County, Kenya. This is in agreement with the findings in Table 4.23 which show that the Principals' utilization of SMS was being 61 (76.3 %) compared to e-mail 20 (25.0%) and MIS 18 (22.5%) respectively.

The F-values show that the variability in e-mail ( $F=7.875$ ) and MIS ( $F=6.683$ ) is small compared to SMS ( $F=64.031$ ) and website ( $F=36.197$ ). Therefore, this means that e-mail and MIS utilization between sub county, county, and national schools do not differ to a great extent but there is a great difference in utilization within sub county, county or national schools themselves. On the hand, website ( $F=36.197$ ) and SMS ( $F=64.031$ ) utilization between these categories of schools differ to a great extent low-quality but the differences in utilization within sub county, county or national schools is small. The small differences in the utilization of e-mail between sub county, county and national schools can be explained from the government policy that requires schools to file EMIS returns through e-mail. These, therefore, compels all school principals to utilize e-mail, thus narrowing the variability. While on the other hand, the absence of a policy framework for the utilization of SMS and website in communication has resulted in different utilization levels between sub county, county, and national public secondary schools, thus bringing about great variability.

**Significance of Difference Analysis of Information Systems Specific Utilization on Communication by Principals**

This study sought to conduct the analysis of variance to establish the significance of the difference of specific IS utilization on the management of finance in sub county, county, and national public secondary schools. The results are illustrated in Table 4.3.

**Table 4.3: Significance of Difference Analysis of Information Systems Specific Utilization on Management of Communication by Principals**

Variable	IS utilization	SSB	SSW	FB	DFW	MSB	MSW	F	Sig
Used for communication	MIS	51.580	297.170	2	77	25.790	3.888	<b>6.683</b>	<b>.002</b>
	e-mail	40.755	199.245	2	77	20.877	2.588	<b>7.875</b>	<b>.001</b>
For convening meetings	SMS	59.760	55.760	2	77	29.580	.720	<b>41.500</b>	<b>.000</b>
For KNEC registration	Web site	7.840	7.360	2	77	3.920	.096	<b>41.011</b>	<b>.000</b>
Used for obtaining information	SMS	53.527	56.160	2	77	26.764	.729	<b>36.690</b>	<b>.000</b>
	e-mail	1.246	10.302	2	77	.624	.134	<b>4.664</b>	<b>.012</b>
Sending EMIS	e-mail	2.640	4.560	2	77	1.320	.059	<b>22.289</b>	<b>.000</b>
Sending information	e-mail	.637	8.113	2	77	.318	.105	<b>3.022</b>	<b>.000</b>
	SMS	18.428	23.760	2	77	9.214	.309	<b>29.859</b>	<b>.000</b>

\*. The mean difference is significant at the 0.05 level.

N= 80(sub county- 54, county-24, national-2)

SSB-sum of squares between -sum of squares within, of-degrees of freedom between,DFW-degrees of freedom within, MSB-mean squares between, MSW-mean squares within, F- ANOVA value, sig- significance

In Table 4.3, analysis of variance was conducted to test for significance of differences between MIS, SMS, e-mail, e-learning and website utilization with respect to general communication, convening meetings, obtaining information, sending EMIS, and sending general information between; sub county, county and national public secondary schools in Nyamira County. It was found out that there is a statistical significant difference at  $p < .002$  in MIS utilization on general communication;  $MIS, F(2, 77) = 6.683$ ,  $p < .002$  between sub county, county and national public secondary schools. Since  $p < .002$  is less than  $p < .05$ , the null hypothesis is rejected: 'There is no significant difference in IS utilization on management of communication between sub county, county and national public secondary schools in Nyamira County,



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Kenya.' Therefore, the alternative hypothesis is accepted: 'There is a significant difference in IS utilization on management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.' Thus, the study has found out that MIS is utilized for general communication.

From the F-values; ( $F=6.683$ ) is small, indicating that there is a small variability in MIS utilization on communication between sub county, county and national public secondary schools in Nyamira County. Therefore the ratio of MIS utilization between sub county, county, and national schools does not differ. On the other hand, there is a high variability in MIS utilization within sub county, county, and national schools. Therefore, the MIS utilization may have been embraced in a few schools at sub county, county, and national schools.

Similarly, there is a significant difference at  $p < .000$  level in SMS utilization on: convening meetings; SMS,  $F(2, 77) = 41.50$ , obtaining information, SMS,  $F(2, 77) = 36.690$ , and sending information; SMS,  $F(2, 77) = 29.859$ ,  $p < .000$  between sub county, county and national public secondary schools. Since  $p < .000$  is less than  $p < .05$ , the null hypothesis is rejected: 'There is no significant difference in IS utilization on the management of communication in public secondary schools in Nyamira County, Kenya.' Therefore, the alternative hypothesis is accepted: 'There is a significant difference in IS utilization on the management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya. Thus, the data has revealed that MIS is utilized on convening meetings, obtaining information and sending information in sub county, county and national public secondary schools in Nyamira County, Kenya.

From the F-values ( $F = 41.5$ ,  $F = 36.690$  and  $F = 29.859$ ), they indicate that there is an average variability in SMS utilization on convening meetings, obtaining information and sending information between sub county, county and national public secondary schools in Nyamira County. Therefore, the SMS utilization on convening meetings, obtaining information and sending information, has been embraced to different degrees in sub county, county, and national schools. On the other hand, SMS utilization on convening meetings, obtaining information and sending information to the sub county, county or national schools shows low or minimal variance.

E-mail utilization shows a significant difference at  $p < .000$  level in utilization on sending EMIS, e-mail,  $F(2, 77) = 22.289$ , sending information, e-mail,  $F(2, 77) = 3.022$  and on general communication, e-mail,  $F(2, 77) = 7.875$ ; and at  $p < .001$  on obtaining information e-mail,  $F(2, 77) = 4.664$ ,  $p < .012$  between sub county, county and national public secondary schools in Nyamira County, Kenya. Since  $p < .000$ ,  $p < .001$  and  $p < .012$  are less than  $p < .05$ , the null hypothesis is rejected: 'There is no significant difference in IS utilization on the management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.' Therefore, the alternative hypothesis is accepted: 'There is a significant difference in IS utilization on the management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya. Thus the data has revealed that e-mail is utilized on; sending EMIS, sending general information, for general communication and obtaining information in sub county, county and national public secondary schools in Nyamira County, Kenya. The question how IS are utilized on the management of curriculum implementation and supervision in public secondary schools in Nyamira County, Kenya is answered. Equally, the 3<sup>rd</sup> null hypothesis was tested at  $p < .05$  statistical significance levels.

Each of the two principals concurred that e-mail was utilized on; general communication, obtaining information, convening meetings and sending EMIS to TSC headquarters.

Detailed information on the utilization of e-mail was obtained from the in- depth interview of the principals. The explanations given indicate that e-mail is convenient and safe for utilization on sending and obtaining information. The information sends through e-mail was said to be secure as it is accessed through use of the secret password. The principal 1 in school 1 said that information sent through e-mail reaches the intended destination immediately. The principal further explained that sent information ranges from a few sentences to bulk notes and thus it is a sure method of a one to one communication. Whereas principal 2 in School 2 does not dispute that, the principal said that the message may not reach the recipient immediately owing to the fact that the recipient may take time to check his or her e-mails. However, they were in agreement that e-mails are secure means of obtaining and sending information.

The two principals, on the other hand, concurred that e-mail has been very useful in sending EMIS to the TSC headquarters through a network, replacing the ordinary method where hard copies are sent through the post office; a method that takes a to reach the intended destination. Principal 1 in school 1 explained that E-mail utilization on sending EMIS returns to TSC headquarters has greatly reduced the time and cost of sending hard copies through the post office thus improving communication efficiency and effectiveness. While principal 2 in school 2 echoed the sentiments of

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Principal 1 in school 1, Principal 2 in school 2 but retaliated that e-mails could also be utilized on sending queries to education headquarters; however, the infrastructure development for its utilization was still low.

From the F-values (  $F = 22.289$ ,  $F = 3.022$ ,  $F = 7.875$  and  $F = 4.664$ ), show that there is a small variability in e-mail utilization on sending EMIS, sending general information, for general communication and obtaining information between sub county, county and national public secondary schools in Nyamira County. Therefore, the e-mail utilization on sending EMIS, sending general information, for general communication and obtaining information utilization between sub county, county, and national schools have minimal differences; however, its utilization on sending EMIS is slightly more varied. On the other hand, e-mail utilization within each sub county, county, and national schools varies more. This means that the sub county, county, and national schools have not embraced e-mail utilization to the same level.

SMS utilization has a significant difference at  $p < .000$  level on convening meetings, SMS,  $(2, 77) = 41.500$ , obtaining information, SMS,  $(2, 77) = 36.699$  and on sending information, SMS,  $(2, 77) = 29.859$  between sub county, county and national public secondary schools in Nyamira County. Since  $p < .000$  less than  $p < .05$ , the null hypothesis is rejected: 'There is no significant difference in IS utilization on management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.' Therefore, the alternative hypothesis is accepted: 'There is a significant difference in IS utilization on the management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya. Thus the data has revealed SMS utilized on; convening meetings, obtaining information and sending information in sub county, county and national public secondary schools in Nyamira County, Kenya.

The detailed information on how SMS is utilized was obtained through the in-depth interview of principals of national public secondary schools. When each of the principals was asked to explain how SMS was utilized for convening meetings, sending and sending information, Principal 1 in school 1 said that SMS was widely used in communicating within and outside the school while principal 2 in school 2 said that SMS was very convenient in sending information to parents to inform them about general meetings. Principal 2 in school 2 said that; what was needed was to write a short message on the internet connected computer and making a single click, would send bulk messages to all intended parents of the school. Principal 2 in school 2 further explained:

It is a wonderful tool of communication as feedback is given immediately when the parents receive the message. Principal 2 in school 2 further explained that SMS could be used to convene staff meetings, HODs' meetings and urgent meetings in general because it was a quick and effective means of communication. Although, Principal 2 in school 2 said that SMS was the quickest means where feedback was instant; in some instances HODs reported that teachers played ignorance and failed to attend meetings blaming it on message failure.

From the F-values (  $F = 41.500$ ,  $F = 36.699$  and  $F = 29.859$ ), show that there is moderate variation in SMS utilization on convening meetings, obtaining information and sending information between sub county, county and national public secondary schools in Nyamira County. On the other hand, it means that SMS utilization on convening meetings, obtaining information and sending information to each sub county, county, and national schools variation is reasonably high. This means that means that each sub county, county, and national schools have embraced SMS utilization on convening meetings, obtaining information and sending information at different levels hence the variation.

Website utilization has a significant difference at  $p < .000$  level on KNEC registration of KCSE candidates, website  $(2, 77) = 41.001$  between sub county, county and national public secondary schools in Nyamira County. Since  $p < .000$  less than  $p < .05$ , the null hypothesis is rejected: 'There is no significant difference in IS utilization on the management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.' Therefore, the alternative hypothesis is accepted: 'There is a significant difference in IS utilization on the management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya. Thus the data has revealed that Website is utilized on KNEC registration in sub county, county and national public secondary schools in Nyamira County, Kenya.

When the principals of national public secondary schools were asked to explain how website is utilized, each of the two principals concurred that website was very useful in the registration of KCSE candidates, filing tax returns and as a source of information for research on teaching and learning materials; however, its utilization was hampered by power failures, lack of manipulative skills on the side of principals and HODs and lack of infrastructure such as the internet. Principal 1 in school 1 explained:

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The website is the most common and reliable source of information available for students and teachers to search for teaching and learning materials. Any material that a teacher or a student is in need of is found on the website. Kenya National Examination Council (KNEC) utilizes the website for registration of Kenya Certificate of Secondary Education (KCSE) candidates online. It is also used by teachers to file, Kenya Revenue Authority (KRA) tax returns. There is no more queuing at KRA offices or filling hard copy forms. One needs to only visit the KRA website, access the online form and follow instructions as filling proceeds.

From the F-values (F= 41.001), it shows that there is moderate variation in website utilization on KNEC registration between sub county, county and national public secondary schools in Nyamira County. On the other hand, it means that website utilization on KNEC registration within each sub county, county, and national schools variation is moderately low.

**Post Hoc Multiple Comparisons of Information Systems Specific Utilization on Communication Management by Principals**

Post hoc multiple comparisons were done to establish where the differences in IS utilization occurs between sub county, county and national public secondary of Nyamira County. This would indicate where variability in IS utilization occurred.

**Table 4.4: Post Hoc Multiple Comparisons of Information Systems Specific Utilization on Communication**

Dependent Variable	(I) cat of school	(J) cat of school	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
out-inf-email	1 Sub county	2 County	<b>-.264*</b>	.089	<b>.011</b>	-.48	-.05
		3 National	<b>-.264</b>	.263	<b>.577</b>	-.89	.37
	2 County	1 Sub county	<b>.264*</b>	.089	<b>.011</b>	.05	.48
		3 National	<b>.000</b>	.269	<b>1.000</b>	-.64	.64
	3 National	1 Sub county	<b>.264</b>	.263	<b>.577</b>	-.37	.89
		2 County	<b>.000</b>	.269	<b>1.000</b>	-.64	.64
obt-inf- SMS	1 Sub county	2 County	<b>-1.560*</b>	.207	<b>.000</b>	-2.06	-1.06
		3 National	<b>-3.000*</b>	.615	<b>.000</b>	-4.47	-1.53
	2 County	1 Sub county	<b>1.560*</b>	.207	<b>.000</b>	1.06	2.06
		3 National	<b>-1.440</b>	.628	<b>.063</b>	-2.94	.06
	3 National	1 Sub county	<b>3.000*</b>	.615	<b>.000</b>	1.53	4.47
		2 County	<b>1.440</b>	.628	<b>.063</b>	-.06	2.94
snd-inf- SMS	1 Sub county	2 County	<b>-.360*</b>	.135	<b>.025</b>	-.68	-.04
		3 National	<b>-3.000*</b>	.400	<b>.000</b>	-3.96	-2.04
	2 County	1 Sub county	<b>.360*</b>	.135	<b>.025</b>	.04	.68
		3 National	<b>-2.640*</b>	.408	<b>.000</b>	-3.62	-1.66
	3 National	1 Sub county	<b>3.000*</b>	.400	<b>.000</b>	2.04	3.96
		2 County	<b>2.640*</b>	.408	<b>.000</b>	1.66	3.62
snd-inf- email	1 Sub county	2 County	<b>-.189*</b>	.079	<b>.049</b>	-.38	.00
		3 National	<b>-.189</b>	.234	<b>.700</b>	-.75	.37
	2 County	1 Sub county	<b>.189*</b>	.079	<b>.049</b>	.00	.38
		3 National	<b>.000</b>	.239	<b>1.000</b>	-.57	.57
	3 National	1 Sub county	<b>.189</b>	.234	<b>.700</b>	-.37	.75
		2 County	<b>.000</b>	.239	<b>1.000</b>	-.57	.57
reg knec-web	1 Sub county	2 County	<b>-.160</b>	.075	<b>.090</b>	-.34	.02
		3 National	<b>-2.000*</b>	.223	<b>.000</b>	-2.53	-1.47
	2 County	1 Sub county	<b>.160</b>	.075	<b>.090</b>	-.02	.34
		3 National	<b>-1.840*</b>	.227	<b>.000</b>	-2.38	-1.30
	3 National	1 Sub county	<b>2.000*</b>	.223	<b>.000</b>	1.47	2.53
		2 County	<b>1.840*</b>	.227	<b>.000</b>	1.30	2.38

\*. The mean difference is significant at the 0.05 level.

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obt-inf-email-obtaining information using e-mail, obt-inf- sms-obtaining information using SMS, snd-inf- SMS- sending information using SMS, snd-inf- email- sending information using e-mail, reg knec-web-registering in KNEC using website

Information Systems utilization on communication cannot be ignored especially during this period of global digitalization. The data in Table 4.4, show that there is a significant difference at  $p < .011$  and at  $p < .049$  level in the utilization of e-mail on obtaining and sending information between sub county and county public secondary schools of Nyamira County, with mean differences of;  $-.264$  and  $-.189$  respectively. Since  $p$ -value  $p < .011$  and  $p < .049$  are less than  $p < .05$ , the null hypothesis is rejected: 'There is no significant difference in IS utilization on management of communication between sub county and county; sub county and national public secondary schools in Nyamira County, Kenya.' Therefore, the alternative hypothesis is accepted: 'There is a significant difference in IS utilization on management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya. Thus the data has revealed that there is a variance in e-mail utilization on obtaining and sending information between; sub county, county and national public secondary schools in Nyamira County, Kenya. A negative mean difference of  $-.264$  and  $-.189$  in its utilization is lower at sub county compared to county public secondary schools. Therefore county schools have adopted the utilization because they have better capital resources for the acquisition of the necessary infrastructure.

Contrastingly, the data shows that there is no significant difference at  $p < .577$  and  $p < 1.000$  in e-mail utilization on obtaining and sending information between sub county and national; and county and national public secondary schools in Nyamira County respectively. Therefore, since  $p < .577$  and  $p < 1.000$  are greater than  $p < .05$ , the null hypothesis is not rejected: 'There is no significant difference in IS utilization on the management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.' Thus, the findings show that the utilization of e-mail on obtaining and sending information between sub county and national public secondary schools does not vary. This argument can be attributed to the fact that sub county schools are striving to supplement the shortages in materials using information systems, while the national schools are trying to improve their effectiveness and efficiency through information systems.

In modern communication, SMS is the most common form of communication in all sectors of society. The data from the table indicate that there is a significant difference at  $p < .000$  and  $p < .025$  level in SMS utilization on obtaining and sending information between sub county and county public secondary schools of Nyamira County with mean differences of;  $-1.560$  and  $-.360$  respectively. Equally, the mean difference for SMS utilization on obtaining and sending information between sub county and national schools is  $-3.000$  and between county and national schools is  $-1.440$  respectively. This shows that SMS utilization is less at sub county and county schools when compared to national schools. This means that principals in sub county schools are not using SMS for obtaining and sending information as much as the county schools; and county schools are not using SMS for obtaining and sending information as much as the national schools do. Since  $p < .000$  and  $p < .025$  are less than  $p < .05$ , the null hypothesis is rejected: 'There is no significant difference in IS utilization on management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.' Therefore, the alternative hypothesis is accepted: 'There is a significant difference in IS utilization on management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya. Thus the data has revealed that there is a variance in e-mail utilization on obtaining and sending information between; sub county, county and national public secondary schools in Nyamira County, Kenya. Thus, the data in table 4.27 supports the argument that SMS utilization by principals is low in sub county schools which are smaller in size hence there is more physical contact between the principal and other workers enabling one on one communication, as compared to county and national schools that are large making, thus reducing physical contact and one on one communication in that order.

Contrastingly, the data shows that there is no significant difference at  $p < .063$  in SMS utilization on obtaining information, between the county and national public secondary schools in Nyamira County. Therefore, since  $p < .063$  is greater than  $p < .05$ , the null hypothesis is not rejected: 'There is no significant difference in IS utilization on the management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.' Thus, the findings show that the utilization of SMS on obtaining information between the county and national public secondary schools does not vary. These two categories of schools have almost similar structures in their administrative organization; therefore, the utilization of SMS in obtaining information from the various departments does not vary.

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The requirement by the KNEC body, that each school register the KCSE candidates online; using KNEC website, has revitalized the services offered by the body. The data in the table above show that Website utilization has a significant difference at  $p < .000$  levels in registering KNEC candidates with a mean difference of  $-.160$  between sub county and county,  $-2.000$  between sub county and national; and  $-1.840$  between the county and national public secondary schools. Since  $p < .000$  is less than  $p < .05$ , the null hypothesis is rejected: 'There is no significant difference in IS utilization on management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.' Therefore, the alternative hypothesis is accepted: 'There is a significant difference in IS utilization on management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.' Thus the data has revealed that website utilization on registering KNEC candidates is low at sub county schools compared to county and national; and county compared to national public secondary schools in Nyamira County, Kenya. This means that principals in sub county schools mostly use technicians at cyber cafes for KNEC registration of their candidates because of inadequate IS facilities at school. Quite a number of their counterparts in county schools also do the same as supported by the small mean difference of  $-.160$  between sub county and county schools. This practice reduces confidentiality of school documents because of exposure to non-professional cyber cafes staff. Therefore, schools ought to embrace IS utilization at school level in order to uphold quality education.

Contrastingly, the data shows that there is no significant difference at  $p < .090$  level in website utilization on KNEC registration between sub county and county public secondary schools in Nyamira County. Therefore, since the  $p < .090$  is greater than  $p < .05$ , the null hypothesis is rejected: 'There is no significant difference in IS utilization on the management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.' Thus, the findings show that the utilization of website on KNEC registration between sub county and county public secondary schools does not vary owing to the inadequate IS facilities and manipulation skills of the principals. Although it is a requirement by KNEC that schools register their candidates online from school, the practice has not been successful. This is because a good number of sub county and county schools lack adequate facilities such computers, the electricity statistically and internet which is pre-requisite for IS utilization. As such utilizing cyber cafes denies them the practice of the skills and knowledge necessary for adoption of IS leading to low level IS utilization by principals of sub county and county public secondary schools.

Table 4.5: Post Hoc Multiple Comparisons of Information Systems Specific Utilization on Communication Continued

Dependent Variable	(I) cat of school	(J) cat of school	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
snd-kra web	1 Sub county	2 County	<b>-.240*</b>	.090	<b>.025</b>	-.45	-.03
		3 National	<b>-2.000*</b>	.267	<b>.000</b>	-2.64	-1.36
	2 County	1 Sub county	<b>.240*</b>	.090	<b>.025</b>	.03	.45
		3 National	<b>-1.760*</b>	.272	<b>.000</b>	-2.41	-1.11
	3 National	1 Sub county	<b>2.000*</b>	.267	<b>.000</b>	1.36	2.64
		2 County	<b>1.760*</b>	.272	<b>.000</b>	1.11	2.41
snd-emis-email	1 Sub county	2 County	<b>-.240*</b>	.059	<b>.000</b>	-.38	-.10
		3 National	<b>-1.000*</b>	.175	<b>.000</b>	-1.42	-.58
	2 County	1 Sub county	<b>.240*</b>	.059	<b>.000</b>	.10	.38
		3 National	<b>-.760*</b>	.179	<b>.000</b>	-1.19	-.33
	3 National	1 Sub county	<b>1.000*</b>	.175	<b>.000</b>	.58	1.42
		2 County	<b>.760*</b>	.179	<b>.000</b>	.33	1.19

snd-kra web- sending kra returns using website, snd-emis-email- sending EMIS – using e-mail

The utilization of IS on KRA and EMIS returns in Table 4.5, show that there is a significant difference at  $p < .025$  level in utilization of website on filing and sending KRA returns with a mean difference of  $-.240$  between sub county and county; and  $.240$  between county and sub county; and at  $p < .000$  level in utilization of e-mail on sending EMIS with a mean difference of  $-2.000$  between sub county and national; and  $-1.760$  between county and national schools. Since  $p < .025$  and  $p < .000$  are less than  $p < .05$ , the null hypothesis is rejected: 'There is no significant difference in IS utilization on management of communication between sub county, county and national public secondary schools in Nyamira County,

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Kenya.’ Therefore, the alternative hypothesis is accepted: ‘There is a significant difference in IS utilization on management of communication between sub county, county and national public secondary schools in Nyamira County, Kenya.’ Thus, the data reveals that website utilization on filing and sending KRA returns with a mean difference of -.240 between sub county and county; and e-mail utilization on sending EMIS with a mean difference of -2.000 between sub county and national; and -1.760 between county and national schools, is low. The low utilization of website and e-mail among principals of sub county secondary schools is attributed to the inadequate skills and resources necessary for the IS adoption. This therefore means that these services are not offered to most sub county and county schools and as a result the principals seek these services from cyber cafes which are at a distance. Overall, there is a lot time wasted in the process of seeking for these services leading to poor quality of education.

**5. DISCUSSION**

This study established that SMS, website, and E-mail are utilized by principals in the process of communication in the day to day running of the schools. However, the principals, in addition to SMS, website, and e-mail, utilized MIS. It was established that SMS was mostly used in sending and obtaining information and for convening meetings. In addition to utilization on general school communication; e-mails used for sending EMIS to the Teachers Service Commission (TSC). These findings were contrary to the study of Mostosto, Namasaka, and Odero (2013) that indicated Masinde Murilo University of Science and Technology (MMUST) relied on HODs verbal communication, group representations, memos, notice boards, face to face and telephones for its communication. Whereas the website has provided fast, efficient and effective means of candidate registration for KNEC, Odero, and Oroko, (2013), argue that it reduces multiple registration and impersonation cases in KCSE examinations in Kenya.

Odhiambo (2005) argued that principals used school assemblies, staff meetings, HODs as information carriers, memos, staff reports and consultations to communicate within the schools. However, it was noted that these channels are prone to distortion due to language barrier and absenteeism on the part of the recipients. This gap can be bridged by IS utilization such as MIS, E-mail, website, and SMS which provide efficient and effective means not prone to distortion.

The study found from both HODs and principals, that SMS was utilized in sending and receiving information, and for convening meetings but as reported by Clarke (2015), in Newzealand, most schools use SMS to send achievement data of student to parents. While in Tanzania, it is used to send Education Management Information Systems (EMIS) and statistical data to the Ministry of Education and vocational training (MoEVT). These studies agree with the present findings to the extent that SMS has a wide application in the management of Education, hence its utilization in the management of public secondary schools in Nyamira county could bring effective and efficient service delivery.

Utilization of website in the management of public secondary schools in Nyamira County was found to affect KNEC KCSE registration and filing of KRA returns, obtaining information, covering meetings and sending EMIS to TSC. This study agrees in part to that carried out by Sunday and Oni (2012), in Nigeria which found that school administration used E-mail to send and receive bulk information to and from parents and other stakeholders. This information could be mainly on students, staff, and materials from the government and other agencies.

Where there is efficient and effective communication, information is received and sent on time; thus facilitating decision making. This would mean that vital information is passed to the ministry of education, TSC and the youth in schools on time; enabling them to participate in national issues. This would ensure that the graduates are well informed about national activities to be able to participate in nation building.

**6. CONCLUSION**

The study has established that there is a positive relationship between IS utilization and management of fee collection problem, lesson attendance by teachers and students, timetable, examination analysis, lesson delivery in class, and cost of communication. Information Systems have significantly improved; fee collection problem, number of lessons missed by teachers and students, number of days taken to analyze examinations, number of days taken to make timetable and the cost of communication between the school and education headquarters: thereby, improving service delivery leading to achievement of school set goals.

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### Recommendations of the study:

This study recommends the following;

- i. All schools should be connected with electricity to enable them to install computers in schools.
- ii. The government of Kenya should provide internet connectivity to schools to enable them to utilize information systems as a way of enhancing management efficiency.
- iii. Every secondary school in Kenya should embrace IS utilization in order to overcome management challenges facing secondary school principals, as this study indicates, that fee collection problem, fraud, money loss and wastage of time can greatly be reduced from IS utilization.
- iv. A policy framework should be developed to guide IS utilization development for all schools for them to experience fair and professional IS utilization and implementation.

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