



Journal Homepage: -www.journalijar.com
**INTERNATIONAL JOURNAL OF
 ADVANCED RESEARCH (IJAR)**

Article DOI:10.21474/IJAR01/ 9609
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/9609>



RESEARCH ARTICLE

AN EVALUATION OF THE FACTORS AFFECTING THE USE OF ICT IN SECONDARY SCHOOLS' MANAGEMENT IN KENYA: A CASE OF NAROK COUNTY.

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Manuscript Info

Manuscript History

Received: 20 June 2019

Final Accepted: 22 July 2019

Published: August 2019

Key words:-

ICT, Client, Management, Internet, Bundles.

Abstract

The purpose of this study was to determine whether there existed a relationship between three selected ICT variables and management of secondary schools in Narok County in Kenya. The selected variables that were used in the study included IT literacy level, accessibility of internet or internet enabled devices and awareness in ICT usage. Quantitative research methodology was used under the umbrella of survey research design. Purposeful sampling strategy was used to select 240 parents (4 parent representatives from forms 1-4) as accessible population for the study. Questionnaires were used to collect data from parents in Narok County. A Cronbach's alpha index was used to check reliability which was found to be .76 for all items used. Collected data were analyzed using Pearson's correlation coefficient with the help of Statistical Package for Social Sciences (SPSS). The findings of the analysis of data revealed that there exists a relationship between literacy of the clients, accessibility of internet by clients and level of awareness of ICT and principals management using ICT in secondary schools in Narok County. The findings revealed that the use of ICT was a new phenomenon and its adoption had challenges but vital in school management. Out of this study, recommendations were made to the Narok community members who formed major clients in schools, the County and National Governments and education stake holders in Kenya.

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Introduction:-

Information communication technology (ICT) is the application of computers and telecommunications equipment to store, retrieve, transmit and manipulate data, often in the context of a business management and other enterprises for example management of schools (Pountain, 2003). User adoption of a technology has become a crucial measure of the success and effectiveness in the success of many schools and businesses across the world (Raul & Hashagen, 2000). Revolutionary development in Information and Communication Technology (ICT) in the past 20 years has had effects on individuals as well as schools and businesses in a profound way. While ICT is considered a quick means of communication to clients who in this case are parents, students, the community and education officials, it is noted that there is need for clients to be ready to receive information at any time, a fact that has been found wanting in Narok County. More and more schools are transforming from their traditional approach of "bricks and mortar" into a "clicks and mortar" one under the recent emergence of electronic commerce and business (Chau &

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Lai, 2003; Morrison & Lowther, 2010). Though customer acceptance is a key driver determining the rate of change in the management, it is vital to note that holding customers from acceptance of ICT usage has been an uphill task (Sathye, 1999). Use of ICT in Narok schools is wanting but it is a must do thing in this era where information about what is happening in schools has to be known not only to the parents but to other education stake holders in the country and the world at large. There are challenges to the use of ICT in management of schools in Narok that principals need to tackle if a success story has to be told.

Background to the Study

Though many people belief and perceive ICT to be a new phenomenon, history has shown that humans have been storing, retrieving, manipulating and communicating information during the times of Sumerians of Mesopotamia. The term information technology was first used and appeared in 1958 in the Harvard Business Review. The proponents of ICT terminology in the business and management world were Leavitt and Whisler whose work appeared in 1958. Based on the storage and processing technologies employed, it is possible to distinguish four distinct phases of IT development: pre-mechanical (3000 BC – 1450 AD), mechanical (1450–1840), electromechanical (1840–1940) and electronic (1940–present) (Butler, 2012). The first and earliest mechanical analogue computer (geared mechanism) referred to as the Antikythera mechanism was used at the beginning of the first century. However, it was not until 1645 when the first mechanical calculator capable of performing the four basic arithmetical operations was developed (Leavitt & Whistler, 1958).

It was not until 1940s when electronic computers, using either relays or valves began to appear for use in business and as a tool for management of organizations with electromechanical (Zuse Z3) completed in 1941 as the world's first programmable computer, and by modern standards one of the first machines that could be considered a complete computing machine. The use of ICT innovation in school management can be tracked back to the 1970s when the computerization of schools gained momentum. However, a visible presence of this was evident to the customers since 1980s when some schools in Kenya could communicate to the outside world without necessarily using letters. In the early 1990s there emerged automated voice response (AVR) technology. The 1990s is a period in Kenya when the policy allowed the teaching of computer science in secondary schools as a subject though with challenges in terms of trained personnel and lack of power for most schools especially in the rural areas. On the other hand, Webb (2011) found out that school administrators have an uphill not only in the use of ICT in managing schools but also in its use in classrooms. Through the pledges by the current president and deputy president of Kenya during their campaigns, the piloting of teaching of Computer literacy has commenced in standard one in all Kenyan primary schools (Ngeno, 2015).

Statement of the Problem

The use of ICT in the management of secondary schools in Kenya and Narok County in particular are enormous. As a government, Kenya has made remarkable progress putting in place an ICT policy framework and implementation strategy, complete with measurable outcomes and time frames (Farrell, 2007). However, universal implementation is challenging given the lack of resources, national ICT infrastructure, and even electricity supply particularly in the rural areas. Uses of ICT challenges not only face the recipients of information but also the originators of the same information. Many parents in Narok County are either computer illiterate or semi-literate, a phenomenon that makes it difficult for them to implement and use ICT in the management of their schools. This aspect is also affecting the parents who are not only recipients of information from schools but also general consumers of the product of ICT. Narok County is one of the rural and remote Counties in Kenya with majority of the sparsely populated settlements not served with electricity. This poses a challenge in the use of ICT devices both in schools and students' homes.

Research Hypotheses

1. There is no relationship between IT literacy level of parents and management of secondary schools in Narok County.
2. There is no relationship between accessibility of internet and internet enabled devices by parents and management of secondary schools in Narok County.
3. There is no relationship between the level of awareness in ICT usage by parents and management of secondary schools in Narok County.

Literature Review

Database management systems emerged in the 1960s to address the problem of storing and retrieving large amounts of data accurately and quickly. One of the earliest such systems was IBM's Information Management System (IMS), which is still widely deployed more than 40 years later (Butler, 2012). IMS stores data hierarchically, but in the 1970s Ted Codd proposed an alternative relational storage model based on set theory and predicate logic and the familiar concepts of tables, rows and columns. The first commercially available relational database management system (RDBMS) was available from Oracle in 1980. All database management systems consist of a number of components that together allow the data they store to be accessed simultaneously by many users while maintaining its integrity. A characteristic of all databases is that the structure of the data they contain is defined and stored separately from the data itself, in a database schema. The extensible markup language (XML) has become a popular format for data representation in recent years. Although XML data can be stored in normal file systems, it is commonly held in relational databases to take advantage of their "robust implementation verified by years of both theoretical and practical effort". As an evolution of the Standard Generalized Markup Language (SGML), XML's text-based structure offers the advantage of being both machine and human-readable (Laudon, Travor, Laudon, 1996).

Research conducted in 1997 has shown that age is a factor in the adoption of the use of ICT in management. According to Lemaître (1997), young individuals between 18 and 35 years old appeared to be the future customers of direct distribution channels, as these people seemed to be more open towards newer technologies. Conversely, adult individuals were less interested in online and direct channels, as they manifested stronger desires for social interactions, and were less receptive to use technological innovations. Preservation of culture among the Maasai in Narok County is well adhered to and this has some impacts in the usage of ICT in management. Sathye (1999) found that human beings try to resist change, especially towards technological innovations. Customers, particularly the senior citizens, preferred personal interaction with the ICT sources and they appeared to have technology phobia (Guru, Vaithilingam, Ismail & Prasad, 2000).

The lack of access to computers was one of the reasons for slow adoption of ICT related knowledge. Daniel (1999) who did his study in UK on this aspect revealed that lack of customer access to suitable PCs was the main reason for low usage of electronic relaying of information. On the same view, Ramsay and Smith (1999) found that accessibility was one of the main reasons for non-adoption of internet related reception of information. Studies have shown that low levels of home-owned PCs or lack of internet connectivity slowed down internet adoption growth rate. The Wallis report (1997) also found the access to internet enabled devices and the internet to be inversely related to the adoption and use of internet related information reception.

Ayo, Ekong, Fatudimu and Kapurubandara (2007) studied the level of e-commerce adoption in developing countries and emphasized the need for training programs, workshops and seminars in local languages for awareness and skill development of the locals as encouragement to adopt ICT. Related to this is a study conducted in Kampala by Namirembe in 2007 which found out that user awareness of ICT information reception, e-funds transfer and Internet banking services could be increased through putting in place community based workshops before introduction of new technology funded by the management aspects. Her argument was that few people in Uganda were ICT literate and therefore the introduction of those technologies without any education could hinder the usage of ICT in management.

Heeks (2002) found that personal computer access was very important for online reception of information. Personal computer penetration and electronic reception of ICT information were directly linked to each other. A normal personal computer cost about Ksh 30,000 which is above the average salary of most Kenyans. A study by (Sathye, 1999) concluded that access to computers and the internet was a prerequisite for adoption of Internet reception of ICT information.

Methodology:-

This study was carried out in Narok County which is about 145 km from Nairobi city. Survey research design along with quantitative research approach and questionnaires were used in this study (Gay, Mills & Airasian, 2006; Bryman, 2012). The target population comprised of 60 secondary schools out of which purposeful sampling was done to select 240 parents as accessible population that represented forms 1-4 at the 60 secondary schools in Narok County. Questionnaires were administered to 240 parents to react to items which were measuring various aspects of ICT usage in management. The researcher used Cronbach's alpha index to test the reliability of questions. The test

gave an alpha index of .76. Face validity was used in this study. The data collected were scored, coded and analyzed using Pearson's correlation analysis with the help of SPSS software. Study variables, means, standard deviations, df and r critical were used in the analysis for the production of results. The hypotheses were tested at an alpha level of .05 while r value and r critical were used to determine relationships between variables and rejection or retention of nulls (Gay, Mills & Airasian, 2006; Bryman, 2004; Gall, Gall & Borg, 2003). Results were presented using Tables.

Data Analysis, Presentation and Interpretation of Results

After analysis of data, it was presented and results interpreted. The study variables, means, standard deviations that were used during computation, df and r critical are shown in Table 1.

IT Literacy Level of Parents

To determine whether there was a significant relationship between internet literacy level of parents and management of secondary schools in Narok County, Hypothesis 1 was used.

Hypothesis 1

There is no relationship between IT literacy level of parents and management of secondary schools in Narok County.

To test this relationship, a Pearson product-moment correlation analysis was computed between IT literacy level of parents ($M=1.63$, $SD=.417$) and Management of Secondary Schools ($M=1.70$, $SD=.571$) as shown in Table 1. At 240 degrees of freedom (df), critical $r = .0.139$ at an alpha level of 0.05. The analysis produced an r of .631 which was greater than 0.139 (see Table 2). The result in Table 2 indicates that there was a positive correlation between IT literacy level of parents and management of secondary schools in Narok County. According to the rule of thumb, the two variables were moderately correlated ($r(240) = .631$, $p < .05$). From the results of the analysis for Hypothesis 1 (see Table 2), it came out that there was a significant relationship between IT literacy level of parents and management of secondary schools in Narok County.

Table 1:-Study Variables' Means and Standard Deviations

Variables	M	SD
IT literacy level of parents	1.63	.417
Accessibility of Internet and Internet Enabled Devices	1.57	.465
Level of Awareness of ICT Usage	2.03	.726
Management of Secondary Schools	1.70	.571
$\alpha = 0.05$; $df = 240$, critical $r = .0.139$		

Table 2:-Pearson's Correlation Analysis of the Relationship Between IT literacy level of parents and management of secondary schools in Narok County.

Variables		IT Literacy Level of Parents	Management of Secondary Schools
IT Literacy Level of parents	Pearson correlation	1	.631
	Sig. (2-tailed)		.031
	n	240	240
Management of Secondary Schools	Pearson correlation	.631	1
	Sig. (2-tailed)	.031	
	n	240	240

$P < .05$; $df = 240$; critical $r = 0.139$; $\alpha = 0.05$.

From the results, with an r value of .631 it means that the relationship was moderate and significant. This means that the more literate the parents were the more they were involved in the usage of IT to respond to issues of school management and vice versa. The results also indicated that r -critical (0.139) was less than the observed r (.631) that was used to determine the status of the null hypothesis in this study. This means that the null hypothesis was rejected thus “there is a significant relationship between IT literacy level of parents and management of secondary schools in Narok County.

Internet and Accessibility of Internet Enabled Devices

To establish whether there is a significant relationship between accessibility of internet and internet enabled devices and management of secondary schools in Narok County, Hypotheses 2 was used.

Hypothesis 2

There is no relationship between accessibility of internet and internet enabled Devices by parents and management of secondary schools in Narok County.

To check this relationship, a Pearson correlation analysis was done to determine whether there existed a relationship between the parents’ accessibility of internet and internet enabled devices ($M=1.57$, $SD=.465$) and management of secondary schools in Narok County ($M=1.70$, $SD=.571$) as indicated in Table 1. With 240 degrees of freedom (df) the critical $r = 0.139$ at an alpha level of 0.05. The analysis produced an r of .111 which was less than .0.139 (see Table 3). The results displayed in Table 3 indicate that there was a positive correlation between parents’ accessibility of internet and internet enabled devices and management of secondary schools in Narok County. The two variables were moderately correlated ($r(240) = .111$, $p > .05$). From the results of Hypothesis 2 testing (see Table 3), it emerged that there was a significant relationship between parents’ accessibility to internet and internet enabled devices and management of secondary schools in Narok County. From the results produced, with a Pearson’s correlation value of .111 it means that the relationship was minimal but significant. This can be interpreted to mean that accessibility of internet and internet enabled devices by parents had no consequence in school management issues while the reverse could be the case.

Table 3:-Pearson’s Correlation Analysis of the Relationship Between Accessibility of Internet and Internet Enabled Devices by Parents and Management of Secondary Schools in Narok County

Variables	Accessibility of Internet Enabled Devices	Management of Secondary Schools
Accessibility of Internet Enabled Devices	Pearson correlation 1 Sig. (2- tailed) n 240	.111 .085 240
Management of Secondary Schools	Pearson correlation .111 Sig. (2- tailed) n 240	1 .085 240

$P > .05$; $df = 240$; critical $r = .0.139$; $\alpha = 0.05$.

The results also indicated that the r -critical (0.139) was greater than the Pearson’s correlation r (.111) that was used to determine whether to retain or reject the null. This means that null hypothesis 2 was retained thus “there is no relationship between accessibility of internet and internet enabled devices by parents and management of secondary schools in Narok County”.

Level of Awareness of in ICT Usage by Parents and Management of Secondary Schools in Narok County.

The other aspect that was tested in this study was the level of awareness of ICT usage by parents and management of secondary schools in Narok County. This was done by the use of hypothesis 3.

Hypothesis 3

There is no relationship between the level of awareness of ICT usage by parents and management of secondary schools in Narok County.

This relationship was tested using a Pearson correlation analysis i.e between level of awareness on ICT usage by parents ($M=2.03$, $SD=.726$) and management of secondary schools in Narok County ($M=1.70$, $SD=.571$) as indicated in Table 1. With 240 degrees of freedom (df) the critical $r = 0.139$ at an alpha level of 0.05. The analysis produced an observed r of .246 which was greater than 0.139 (see Table 4). The results shown in Table 4 indicate that there is a positive correlation between the level of awareness of ICT usage by parents and management of secondary schools in Narok County. The two variables had a minimal correlation, $r(240) = .246$, $p < .05$. This result (see Table 4), indicates that there is a significant relationship between parents' level of awareness of ICT usage and management of secondary schools in Narok County.

With a Pearson's correlation value of .246 it means that the relationship was minimal but significant. This means that the more the level of awareness of parents had, the more they were involved in school management issues. The result also indicated that r -critical (0.139) was less than the .246 (see Table 4) that was used to reject the null hypothesis. This means "there was a relationship between the level of awareness of ICT usage by parents and management of secondary schools in Narok County".

Table 4:- Pearson's Correlation Analysis of the Relationship Between the Level of Awareness of ICT Usage by Parents and Management of Secondary schools in Narok County

Variables		Level of Awareness of ICT Usage	Management of Secondary Schools
Level of Awareness of ICT Usage	Pearson correlation	1	.246
	Sig. (2- tailed)		.000
	n	240	240
Management of Secondary schools	Pearson correlation	.246	1
	Sig. (2- tailed)	.000	
	n	240	240

$P < .05$; $df = 240$; critical $r = 0.139$; $\alpha = 0.05$.

Discussions:-

Internet literacy is an important aspect that enhances management of schools in many parts of the world. Literacy level and having knowledge in internet are essential in school management. Out of the results of the analysis of this study it came out that there was a significant relationship between IT literacy level of parents and management of secondary schools in Narok County. The results of the analysis of the internet literacy as variable of this study revealed that indeed knowledge in the use of internet is paramount to management of secondary schools in Narok County. Pearson's correlation analysis revealed a positive and significant relationship between internet literacy level and school management. This shows that internet literacy has a role to play in managing schools in terms of receiving and conveying of matters related to management of schools in Narok County. The results of this analysis confirm to the existing literature (Daniel, 1999) that internet knowledge and literacy is an important aspect in school management.

Being literate on how to use internet is itself not enough for parents to access information on school management matters. Parents must also have access to internet services in order for them to receive, retrieve and give feedback. The study findings (see Section 7.2) indicated that parents' accessibility to internet and internet enabled devices was not a major factor in enhancing school management. However, existing literature reveals that personal computer access was very important for online reception and reaction to official matters from schools. However, in Narok the aspect of accessibility to internet and internet enabled devices was found to be insignificant. Level of awareness of the usage of ICT among parents was also tested against secondary schools' management in Narok County. The findings indicated that there was a relationship. Available literature shows that the adoption of internet was

necessary for school management. Literature available also indicates that user awareness should be created through putting in place community based workshops before introduction of new technology.

Conclusion:-

The purpose of this study was to find out whether IT literacy level; accessibility to internet and internet enabled devices; and level of awareness of the usage of ICT among parents had a relationship to secondary schools management in Narok county. To investigate these phenomena, quantitative method was used with the aid of a questionnaire as a tool for data collection. Data collected were analyzed by the use of Pearson r. Apart from the accessibility to internet and internet enabled devices among parents, the findings revealed that internet literacy level and level of awareness of the usage of ICT among parents had significant positive relationships with secondary schools' management in Narok County. The findings of the study were significant in that the IT literacy level and level of awareness of ICT usage by parents were found to have an influential role among parents in the management of secondary schools in Narok County. However, in this study, accessibility to internet and internet enabled devices was found to be insignificant. In other words, parents should be encouraged to increase their IT literacy level and level of awareness of usage of ICT in order to enhance school management. On the other hand, accessibility to internet and internet enabled devices issue that was found to have no relationship with management of secondary schools should be addressed since literature available has emphasis on it implying that it was a necessary phenomenon in other parts of the world from where literature for this study was drawn.

Recommendations

IT literacy level of parents; accessibility of internet and internet enabled devices; and level of awareness of ICT usage by parents and their relationship to management of secondary schools were the independent variables and dependent variable respectively for this study. Out of the findings, recommendations were made. Firstly, it was recommended that civic education should be given to parents about the importance of the use of IT in modern Kenya especially to the Maasai community in relation to school management. This should be initiated at school level during parents' annual general meetings. Secondly, with the assistance of their children in various schools in Narok County, parents should be advised to use cell phones that are internet friendly. On the other hand, once they own internet enabled cell phones, they should be advised to spare some money to buy bundles that they can use to access internet through which they can access information from schools. Lastly, it was recommended that local politicians in collaboration with Kenya Power and Lighting Company should work in harmony to enable the County to have many homes access electricity so that parents can be able to use their desk top computers and lap tops at home instead of taking them to far places especially to Narok Town for re-charging. This is true to even cell phones that require frequent re-charging in order for one to be able to communicate with the school management.

Suggestions for Further Research

This study concentrated on three aspects that can enhance secondary schools management using ICT in Narok County in Kenya. However, there is need for more researches on other factors in relation to management of secondary schools in Narok County. First, the findings on the first aspect (level of awareness of the usage of ICT among parents and secondary schools management in Narok County) indicated that there was no relationship. It was suggested that there is need to research on whether parents in Narok County are ready and willing to accept the use of ICT in the management of secondary schools.

Secondly, there is need to conduct research whether increased family usage of electricity in the rural areas can increase the rate at which parents get influenced and accept management of schools through ICT in Narok County.

Lastly, research should be conducted on the impacts management of secondary schools using ICT in Narok County. This can focus on aspects related to efficiency and school performance in general.

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