



Influence of Organizational Factors on Education Management Information Systems Outcomes in Counties of Nyanza Region, Kenya

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ARTICLE INFO

Article No.: 041714188

Type: Research

DOI: 10.15580/GJER.2014.3.041714188

Submitted: 17/04/2014

Accepted: 15/05/2014

Published: 22/05/2014

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Keywords:

Factors, Education, Information Systems Outcomes, Organizational, Nyanza Region, Kenya

ABSTRACT

Information systems are created to enable organisations utilise technologies to gather and use information for effective management. The Ministry of Education (MOE) is committed to the implementation of Education Management Information System (EMIS) to provide data to improve planning, policy formulation and decision-making. MOE provides IT infra structure, trains personnel to manage data collection and it provides funds annually to the District Education Officers (DEO) to facilitate EMIS activities since 2004. Despite these efforts, EMIS technical team survey reveals that data capture completion rate has been low at the districts education offices thereby delaying the nationwide data processing; while the counties of Nyanza had the lowest data entry completion rate. Therefore this study determined the influence of organizational factors on EMIS outcomes in the counties of Nyanza Region. The study employed both correlation and descriptive survey designs. The population consisted of 36 District EMIS coordinators, 72 Data Capture Personnel, 36 DEOs and the Regional EMIS Coordinator. Stratified sampling technique was used to select 29 District EMIS coordinators, 68 Data Capture Personnel, 29 DEOs and 1 Provincial EMIS Coordinator. The data were collected using questionnaires and Interview schedules. The regression results showed that organizational factors contributed 18.3% towards EMIS outcomes. Management support ($\beta = 0.295$) and resources allocation ($\beta = 0.286$) were the best organizational predictors of EMIS outcomes. The study recommended the transfer of data capture process from the DEOs to individual learning institutions to reduce the bulk of work of data capture and number of EMIS personnel at DEOs office.

INTRODUCTION

Ang et al. (2001a) cite Deming's (1986) theory of Total Quality Management (TQM) which emphasizes that continual gathering and use of statistical data and information leads to effective management. To improve business process and enhance productivity, organizations have therefore developed Information Systems (IS) (Kelegai and Middleton, 2004). Information Systems are the means by which people and organisations utilise technologies, to gather, process, store, use and disseminate information (Burch and Grudnitski, 1989). According to DeLone and McLean (2003), Information System correlates to profitability and productivity in organization, at the same time it leads to motivation of personnel.

Hua and Herstein (2003) noted that successful management of education requires effective policy-making and system monitoring through data and information. Therefore, Education Management Information System (EMIS) is designed to organize and processes information related to the management of education resources and services, to improve planning, resource allocation, monitoring, policy formation and decision-making (Wako, 2003). It is usually established within a national Ministry or department responsible for education. Most EMIS programmes process and disseminate information about learning institutions, demographics of students, teachers and non teaching staff, performance measures data, learning activities, financial management information, community participation and evaluative outputs (Ibrahim, 2005; UNESCO, 2006; Kingdom of Cambodia, 2008).

Countries around the world have invested significant resources into collecting, processing and managing data through EMIS. For example, Cassidy (2006) notes that considerable amounts of resources were directed to EMIS activities in South and Central America in the 1990s. While Caribbean countries have focused on both national and region-wide effort to develop EMIS for over 15 years. In 2006 and 2007 at least four Caribbean countries; Jamaica, Barbados, Antigua, Barbuda and St. Lucia conducted EMIS projects. Gaible (2008) reports that Jamaica launched EMIS initiatives, funded by United States Agency for International Development (USAID), to improve access to school census data, system-wide introduction of computer-based recordkeeping and development of a school-based Geographic Information System (GIS). However, despite the completion of EMIS development, both information access and information utilization in Jamaica remained limited.

In Asia the development of EMIS has been evident in India, Cambodia and Malaysia (Kingdom of Cambodia, 2008). India developed District Information System for Education (DISE) in which all the districts were provided with adequate hardware and MIS software for data collection. By the end of 2003, it was expected that

all the districts would adopt EMIS in two years to replace the manual collection of information.

In Mozambique, EMIS provides a range of statistical information including enrolment of orphans following the HIV/Aids pandemic and about poor attendance and drop-out since 1980, with donor assistance (Trucano, 2006a). Similarly, Spratt and Crouch (2001) noted that Guinea Conakry's ministry of education with USAID and World Bank funding and technical assistance upgraded its infrastructural capacity for information management since the early 1990s. This had enabled Guinea Conakry to produce reasonably sound education statistics distributed in the form of Statistical Yearbooks and disseminated brochures. While in Ghana, Trucano (2006b) observe that attempts at developing the EMIS occurred in the late 1990s, though as a pilot exercise, when the government implemented the policy of Free Compulsory Universal Basic Education (FCUBE). Ghana enhanced and expanded EMIS over the 2004 to 2008 period, to enhance the role played by donors and the logistics associated with procurement and capacity building activities. Trucano (2006c) notes that due to lack of resources, early EMIS work was incomplete and not sustained in Nigeria, however, more recently, development of standardised software has enabled state-level EMIS to provide comprehensive information in support of decentralised management.

The World Bank (2010) acknowledges that over forty World Bank education projects have been initiated which are EMIS or ICT related projects. However, more than half of ICT-related projects have failed in the corporate sector in OECD countries, and that such rates are even higher in the public sector in developing countries. Wako (2003) affirms that EMIS projects supported World Bank projects are often behind schedule and/ or have to be significantly re-worked. Even if a system is delivered on time and within budget, it is not guaranteed that it will be used or liked by its intended users; nor will it achieve the expected benefits. Besides, in countries where EMIS data is successfully captured and documented in Statistical year books and brochures, policy-makers hardly use the data to guide education policies (World Bank, 2010). Similarly, Hwang et al. (2012) observed that implementation of IS is usually resource intensive terms of human resources, time and funds, but the results are often less than satisfactory, finally organizations are forced to abandon the IS project.

EMIS implementation in Kenya was embodied within the Kenya Education Sector Support Programme (KESSP) and the Sessional Paper No. 1 of 2005 (Republic of Kenya, 2005b). KESSP comprises twenty-three (23) investment programmes grouped around six thematic areas of financing, access, sector management, quality, retention, secondary, tertiary and higher education. EMIS is one of the 23 investment plans of KESSP whose role is to provide an effective and efficient framework for a harmonized and timely collection, processing, analysis and dissemination of education data

from all levels of education and training for policy makers, planners, managers and other stakeholders (Republic Of Kenya, 2009a).

Therefore, to achieve these objectives, the Ministry of Education (MOE) has consistently been involved in; capacity building for clerical officers to manage data collection and analysis (Republic of Kenya, 2009b); provide funds annually to the DEOs to facilitate EMIS activities (Republic of Kenya, 2010b); equipping the districts education offices with ICT accessories computers, printers and Local Area Networks (LAN) for data capture; and providing technical assistance for maintenance of the IT infrastructure (Republic of Kenya, 2009a). The data collection targets pre-primary, primary, secondary, non formal education schools, University, Teacher Training Colleges, TIVET, Adult Basic Education and Training institutions (Republic of Kenya, 2009a). The EMIS questionnaires are usually distributed to the learning institutions from MOE headquarters to be completed and then returned to the DEOs office for validation and confirmation of their completeness. Then data personnel carry out entry into system software installed into the computers at the DEOs office, the data is then backed up and sent to the EMIS data centre to be consolidated in a common national database, analyzed and compiled into a report (Republic of Kenya, 2008).

Despite immense expenditure by MOE to facilitate EMIS activities, the Republic of Kenya, (2009c) has acknowledged that incomplete, unreliable data, poor response rates from schools and untimely data collection processes has rendered the EMIS ineffective. Both the EMIS Kenya Educational statistical booklet 2003 – 2007 and EMIS Kenya, Education facts and figures 2002 – 2008 were released in 2009 and 2010 respectively, two years behind schedule and was not available on line for stakeholders' consumption (Republic of Kenya, 2009c; Republic of Kenya, 2009d; Republic of Kenya, 2010a). Similarly, non-response and other parallel systems of data collection have presented challenges in maintaining the consistency of educational indicators (Republic of Kenya, 2010a). Each of the key MOE agencies such as KNEC and TSC had their own data capture software to serve their needs. In addition, lack of continuous internet connectivity between the districts and the MOE headquarters hampered data flows in real time.

Case studies by World Bank have been done in Bangladesh, Ghana, Nigeria and Mozambique to find out best practices and lessons learned from EMIS projects (World Bank, 2011). However, since the Kenyan EMIS programme began in 2005 its effectiveness in fulfilling its objectives has never been evaluated. Yet, according to Republic of Kenya (2010c), in circular Ref No. MOE/EMIS/P/7/11, the MOE did a nationwide survey which revealed that data capture completion rate was low; only 41(15.65%) districts out of 262 had completed to capture the September 2009 data by March 2010. Amongst the 8 regions of Kenya, counties of Nyanza region had the lowest data entry completion rate at the DEOs offices (Ariko, 2014). Therefore, the purpose of the study was to investigate the influence of organizational

factors on Education Management Information Systems outcomes in the counties of Nyanza Region.

Hua and Herstein (2003) noted that the success of information systems (IS) is measured by outcomes like timeliness and reliability of its data and information processing and their effective use for policy decisions. DeLone & Mc Lean (2003) cited in Hussein et al. (2007b) proposed a model of measurable information system outcomes consisting of system use, system quality, user satisfaction, information quality, individual impact and organizational impact. While Bento and Bento (2006) employed usefulness of IT tools, effectiveness and information quality as critical outcomes of performance management systems. Yet, according to DeLone and McLean (2003) IS outcome can be gauged by profitability, productivity, personnel motivation cost and time saving capabilities in organization. Therefore in this study the EMIS outcomes encompassed; information timeliness, completeness, relevance, reliability, accessibility and user satisfaction in view of Hua and Herstein (2003), DeLone and McLean (2003) Hussein et al. (2007b) studies.

Understanding factors that influence outcomes of EMIS in the counties of Nyanza Region is requisite to diagnose how to achieve a higher level of success in its implementation. A number of organizational factors that influence IS outcomes have been advanced by researchers (Hussein et al., 2007b; Young and Jordan, 2009; Dong et al., 2009; Bento and Bento, 2006). These organizational factors include management support, decision-making structure, goal alignment, management style, and managerial EMIS knowledge and resources allocation. Saunders and Jones (1992), Ang et al. (2001b) and Lawrence (2010) studies concur that top management support is fundamental predictor of the outcome of Information System in an organization. Young and Jordan (2009) avow that top management support is the most critical factor to systems implementation success. Other more recent studies found that top management support is effective in both high and low task interdependence groups (Hwang and Schmidt, 2011).

Hussein et al. (2007b) conducted a study on organizational factors that influence information systems success in e-government agencies in Malaysia and found that the involvement and participation of the top-level management of the organization in IT/IS activities was responsive to the successful outcomes of IS. Similarly, King and Teo (1996) and Jarvenpa and Ives (1991) found that managerial support of an IS system is imperative in determining its successful outcomes. King and Teo (1996) argue that since the top management authorizes funds and implements an IS, they would be eager to reap positive results to ascertain whether their decisions were correct and fruitful.

However, not all empirical evidence supports the critical role of top management support (Dong et al., 2009). Sharma and Yetton (2011) asserts that effect of top management support on IS could be situational and not universal as reported by Young and Jordan (2009) and Hwang and Schmidt (2011). Sharma and Yetton

(2011) explain the inconsistency by asserting that top management support is critical when task interdependence is high, but relatively weak and probably not critical component when task interdependence is low.

Ang et al. (2001b) analysed the correlation between decision-making structures and IS success, and they found strong relationships. Specifically, Grover (1993) studies found decentralized decision-making as one of the strongest facilitators of IS/IT use in large and complex organization. Similarly, Trucano (2006c) in Nigeria points out that the development of standardised software augured well for state-level EMIS to provide comprehensive information in support of decentralised management. These findings on decision-making structures are incongruent with Hussein et al. (2007) findings. Hussein et al. (2007) on their part tested a hypothesis that indicated that there is a positive relationship between a centralized decision-making systems with successful outcomes of an IS. They attributed these findings to the nature of the public sector environment which adopts the traditional style of centralized IS structure.

O'Reilly and Pfeffer (2000) assert that highly centralized companies tend to have more bureaucratic traits, while highly decentralized companies may tend to appear to be more out of control. Gaible (2008) noted that centralized structure have met opposition by some governments as they complain that EMIS are imposed by donors more as control mechanisms than as tools for effective planning. Gaible (2008) observed further that local governmental authorities may have similar complaints about their participation in EMIS managed by a central governmental authority, especially where there is no history of sharing information and receiving anything useful in return. From these studies there is no conclusive evidence as to which of the decision-making systems has effect on IS outcome; with centralized having high influence in some studies and decentralized systems better in others (Grover, 1993; Trucano, 2006c).

Hussein et al. (2007) found that management style is highly correlated to IS like system reliability and usability, information relevance and timeliness as well as user satisfaction. According to Hussein et al. (2007), management style deals with the way in which the managers tend to influence, coordinate, and direct people's activities towards group's objectives. In Bento and Bento's (2006) study, they considered decision-making style such as command and control verses collaborative which they found to be related to three critical outcomes of IS; information quality, effectiveness, and usefulness. Hua and Herstein (2003) argue that collaborative management style is crucial for EMIS success since different experts have specific roles to play.

Managerial IT knowledge is yet another fundamental organizational factor that Hussein et al. (2007) found to be positively related to IS success dimensions. Ang et al. (2001b) confirms that senior management experience, background and knowledge on IS/IT, awareness and recognition of IS activities and potentials, as well as their ability to plan strategically has

an impact on IS outcomes. According to Gaible (2008), there has been slow adoption of ICT policies in education sector, due to policymakers' lack of understanding of ICT issues. For example in St. Lucia, Gaible (2008) noted that an ICT-in-education policy was drafted based on the 2002 OERU (OECS (Organisation of Eastern Caribbean States) Education Reform Unit) template, yet the completed policy has not been adopted as of mid-2007.

Ang et al. (2001b) found that goal alignment is the second strongest predictor of IS usage amongst organizational factors. They succinctly defined goal alignment as linking of business goals and corporate IS goals together. Studies by Hussein et al. (2007) and Hua and Herstein (2003) considered goal alignment to be important in determining the outcome of IS. For example, World Bank (2010) observes that management information systems in the education sector have been unsuccessful because they are often designed by technical people, ignorant of prevailing educational policies and with insufficient input from education specialists. According to Hua and Herstein (2003), a shared vision for EMIS leads to all stakeholders, from data entry staff to policy-makers, feeling a sense of ownership not just in EMIS but in its outcome as well. It empowers individuals and units to do more than merely comply with directives and do whatever is in their power to guarantee the success of EMIS.

Wixom and Watson (2001) also found significant relationship between resources and IS implementation. Concurring, Hussein et al. (2007) found resource allocation to be related to system quality, information quality, perceived usefulness and user satisfaction. They argued that organizations having sufficient funds and people tend to succeed in implementing their goals and objectives. Hussein et al. (2007) observed that, the Malaysian government had allocated a huge amount of fund in the national ICT projects and most of them succeeded. Gaible's (2008) experience in Jamaica and Trucano's (2006c) study in Nigeria reveal that early EMIS work in those countries was incomplete and not sustained due to lack of resources. According to Hua and Herstein (2003) EMIS activities are frequently funded initially through one-off disbursements by donor organizations with little hope of funds for sustainability. Gaible (2008) study realized that the high costs associated with acquisition, operation and maintenance of ICT infrastructure was a significant barrier to the increased effectiveness of EMIS programs. In addition, procurement-related issues arising from differing accounting systems and priorities by donors vis-a-vis inter-ministry coordination have led to delays of EMIS projects (Hua and Herstein, 2003).

These reviews on organizational factors as predictors of outcomes of IS tend to suggest that leadership is paramount in determining the outcome of EMIS. However, these studies were limited in scope as they did not consider personnel motivation as a dimension of leadership in the organization in the education sector. It is apparent that research on IS/IT, has often been focused on populations and organisations based in United

States, Malaysia and Australia and large multinational companies like World Bank (Havelka, 2002; Hussein et al., 2007b). These studies seldom focused in institutions operating in an unstable economic environment like Africa in which IT/IS is challenged by low level of ICT skills; lack of functional ICT policy; economic barriers; ICT infrastructure and poor level of computer literacy (Okiy, 2005). More so some conclusions on factors that influenced IS were based on a synthesis of previous theoretical and empirical studies on IS conducted in the 1980s and 1990s (DeLone and McLean, 2003) yet the role of IS has changed during the last decade and academic inquiry into IS effectiveness has progressed over the same period. Hua and Herstein (2003) work was paper presentation based on their decade experience working on EMIS development in MOE in Egypt, Jamaica, Malaysia, Ghana and Latvia. To date there is no pragmatic study that focuses on the management style of

DEOs, yet they play key role in the educational management in Kenya.

In an attempt to fill these knowledge gaps, it was therefore imperative that the influence of motivational mechanism as an organizational factor was investigated in addition to other factors like management support (Ang et al., 2001a; Lawrence, 2010; Young and Jordan, 2009; Hwang and Schmidt, 2011; Hussein et al., 2007b; King and Teo, 1996), decision-making structure and management style (Ang et al., 2001a; Hussein et al., 2007b), managerial EMIS knowledge (Hussein et al., 2007b; Ang et al., 2001b; Gaible, 2008), resources allocation (Wixom and Watson, 2001; Trucano, 2006c; Hua and Herstein, 2003). By focusing in Nyanza Region within Kenyan education sector, this study offered a more current supplementary research to validate the observations made by DeLone and McLean (2003) and Hua and Herstein (2003) in an African context, in a different sector and economic environment.

METHODOLOGY

The study adopted both correlation and descriptive survey designs. The study population were 36 District EMIS coordinators, 72 Data Capture Personnel, 36 DEOs and the Provincial EMIS Coordinator. The sample size of 29 was estimated by adopting the procedure proposed by Krejcie and Morgan (1970) cited in Cohen et al. (2000). Stratified sampling technique was used to select 29(80.6%) District EMIS coordinators and 12(33.3%) DEOs. The 6 strata were Homa Bay, Kisii, Kisumu, Migori, Nyamira and Siaya counties of the Nyanza region. Snowball sampling technique was used to select 68 Data Capture Personnel, and the Regional EMIS Coordinator was purposively sampled. Questionnaires were used to collect information from data capture personnel and EMIS coordinators while in-depth interview helped in collecting information from the District Education Officers and Regional EMIS Coordinator. The pilot study was conducted and questionnaires were pre-tested to test reliability in 8.33% of the entire population namely; 3 District EMIS coordinators, 6 data capture personnel and 3 DEOs. The responses on organizational factors were placed on a rating scale of very high influence, high influence, moderate, low influence and very low influence were rated 5, 4, 3, 2 and 1 respectively, while the responses on EMIS outcomes were placed on a rating scale of Very good, good, moderate, poor and very poor were similarly rated 5, 4, 3, 2 and 1 respectively. Cronbach Alpha formula was used to estimate internal

consistency of items in the questionnaire. An overall internal consistency index of 0.79 and 0.74 were obtained for the 5 items on organizational factors and 6 items on EMIS outcome respectively. These coefficients showed that the instrument was internally consistent. Descriptive statistics such as frequency, mean, standard deviation and percentage of the respondents ratings on EMIS outcomes and influence of organizational factors on the EMIS outcomes were presented in tabular form. Correlation analyses were performed to test relationships among those variables in organizational factors and EMIS outcome variables. Regression analysis was conducted to assess the differentials of influence of components of organizational factors variables on the EMIS outcome. The responses obtained from the semi-structured interviews were transcribed and organized according to the study objectives.

RESULTS

EMIS outcomes

To explore the state of EMIS outcomes in the Sub counties of Nyanza region, Data capture personnel (n =68) and EMIS coordinators (n= 29) responses were recorded. Table 1 shows the descriptive statistics for the responses on ratings of EMIS outcomes in counties of Nyanza Region measured in a 1-5 scale ranging from 'Very Poor' to 'Very Good'.

Table 1: Ratings of EMIS outcomes in counties of Nyanza Region by Data capture personnel (n =68) and EMIS coordinators (n= 29).

Variable	Respondents	Mean	SD
Timeliness of Information.	Data capture personnel	2.66	1.39
	EMIS coordinators	2.48	1.37
Relevance of information.	Data capture personnel	3.38	1.23
	EMIS coordinators	3.52	1.29
Completeness of data.	Data capture personnel	2.83	1.08
	EMIS coordinators	2.62	1.40
Reliability of information.	Data capture personnel	3.28	1.08
	EMIS coordinators	3.24	1.04
Accessibility of information.	Data capture personnel	2.74	1.39
	EMIS coordinators	2.71	1.42
Personnel Satisfaction.	Data capture personnel	2.53	0.88
	EMIS coordinators	3.00	1.18
Overall mean responses on EMIS outcomes	Data capture personnel	2.90	1.24
	EMIS coordinators	2.93	1.28
	Overall response	2.91	1.25
Interpretation: Very Poor = 1.0 -1.9 Poor = 2.0-2.9 Fair = 3.0-3.9 Good = 4.0 - 4.9 Very Good = 5			

Results in Table 1 show that the Data capture personnel indicated that the best EMIS outcome in the Nyanza region was 'Relevance of information' (3.38) followed by 'Reliability of information' (3.28). Similarly, these two EMIS outcomes; 'Relevance of information' (3.52) and 'Reliability of information' (3.24) were found to be the best EMIS outcomes as well as 'Personnel Satisfaction' (3.00) according to the EMIS coordinators too. The response from Regional EMIS Coordinator and DEOs during the interviews corroborated the Data capture personnel's and EMIS coordinators' responses that EMIS data was relevant and reliable. Regional EMIS stressed that, "The EMIS information is relevant, especially in regard to access to school, equity and transition rate. EMIS data assisted in calculation of gender parity and determination of teacher shortage".

Likewise, a DEO was categorical in his comment when he said; "EMIS data very relevant especially information on schools' enrolment helps in effective intervention, policy implementation, feedback and decision making." while another DEO observed that: "EMIS data helps in determination of state of infrastructure such classrooms and toilets." Besides another observed that: "This data had assisted to reveal the extent to which the various ministerial policies on infrastructure have been implemented and areas that still suffer underachievement and hence need for reinforcement and follow up".

Data capture personnel further indicated in Table 1 that 'Personnel Satisfaction' (2.53) was the poorest EMIS outcome followed by 'Timeliness of Information' (2.66), 'Accessibility of information' (2.74), and 'Completeness of data' (2.83). This view was shared by EMIS coordinators who suggested that the poor EMIS outcome in the Nyanza region were attributed to poor; 'timeliness of Information' (2.48), completeness (2.62) and accessibility (2.71) of data. Similarly, results from interviews with DEOs revealed that maintaining data timeliness and consistency was hard. In their unequivocal

response, 7(58.9 %) of DEOs said: "it was quite difficult to beat the deadlines". To that effect, one DEO explained that; "deadlines could not be met because Ministry of Education submits EMIS forms late to the DEOs thus they remit to the educational institutions late too." This view was supported by Regional EMIS Coordinator who proposed that; "when data capture forms are given to DEOs offices in time from headquarters then data capturing can be timely." However there was evidence from the 5 (41.7%) DEOs interviewed that there were attempts to ensure relevance of EMIS data. For example one said: "The TAC tutors do follow-ups and ensure timely submission of the forms and there is always personnel in charge who is held responsible who ensures that data is captured routinely and is relevant."

A considerable disparity was noted that whereas Data Capture Personnel indicated that 'Personnel Satisfaction' (2.53) was the poorest and thus the least influential organizational factor on EMIS outcomes, yet according to the EMIS coordinators, 'Personnel Satisfaction' (3.00) was the third best influential factor (Table 1). Data Capture Personnel's views of poor 'Personnel Satisfaction' was supported by a DEO's comment that: "the EMIS personnel are not motivated, they do the work reluctantly and many are unenthusiastic to work given that they are expected to work overtime including weekends yet EMIS data capture was not their core duty, unless money is set aside to motivate them". By and large, EMIS outcomes in Nyanza Region was poor (M=2.91, S.D=1.25) with both the Data capture personnel and EMIS coordinators indicating a mean rating response of 2.90 and 2.93 respectively.

Influence of Organizational factors on EMIS outcomes

To explore the Influence of Organizational factors on EMIS outcomes in Nyanza Region, Data capture personnel (n =68) and EMIS coordinators (n= 29)

responses were recorded. Table 1 show the descriptive statistics for the responses on their ratings on influence of Organizational factors on EMIS outcomes Nyanza Region

measured in a 1-5 scale ranging from very low influence to very high influence.

Table 2: Ratings of the influence of Organizational factors on EMIS outcomes by Data capture personnel (n =68) and EMIS coordinators (n = 29).

Variable	Respondents	Mean	SD
Management support	Data Capture Personnel	3.49	1.46
	EMIS Coordinators	3.43	1.33
Decision making structures & management style	Data Capture Personnel	3.30	1.33
	EMIS Coordinators	2.92	1.40
Managerial EMIS/ IT knowledge	Data Capture Personnel	3.23	1.32
	EMIS Coordinators	3.52	1.12
Resources allocation	Data Capture Personnel	2.21	1.20
	EMIS Coordinators	2.24	1.22
Motivation mechanisms	Data Capture Personnel	2.40	1.16
	EMIS Coordinators	2.81	1.29
Mean responses on organizational variables	Data Capture Personnel	2.93	1.29
	EMIS Coordinators	2.99	1.27
	Overall response	2.96	1.28

Interpretation: Very Low Influence = 1.0 -1.9
High Influence = 4.0-4.9

Low Influence = 2.0-2.9
Very high influence = 5.0

Moderate = 3.0 - 3.9

The results obtained in Table 2 shows that the Data Capture Personnel indicated that 'Management support' (3.49) was the most important organizational factor that influenced EMIS outcomes, this was followed by 'Decision making structures & management style' (3.30) and 'Managerial EMIS/ IT knowledge' (3.23). They further indicated that 'Resources allocation' (2.21) and 'Motivation mechanisms' (2.40) were the least influential organizational factors on EMIS outcomes.

According to the EMIS coordinators, 'Managerial EMIS/ IT knowledge' (3.52) and 'Management support' (3.43) were the most influential organizational factors on EMIS outcomes according to Data Capture Personnel responses. Though Data Capture Personnel had a similar response on management support, but to a comparatively higher mean to EMIS coordinators' response (Table 2). Similarly, results from interviews revealed that the senior officers supported EMIS activities. For example, Provincial EMIS Coordinator stated that his office supported EMIS activities by relaying of information from MEO head quarters to districts, identifying those districts with problems and alerting EMIS headquarter teams, providing technical support, coordinating the monitoring or EMIS progress, advising the personnel and a number of staff has been trained by MOE head quarters under my guidance. In addition, further DEOs' responses showed that they greatly supported EMIS activities. Specifically the majority 5(41.7.7%) DEOs provided financial,

4(33.3%) indicated that they provided office computers or offered their personal laptops for EMIS data capture. Besides, 3(25.0%) DEOs noted that they coordinated the data collection process from educational institutions through TAC tutors. While another said that they give moral support and follow-up with grassroots to ensure that data collection and capture into the computers was timely.

However, a closer analysis of Table 2 reveals that less emphasis was placed on 'Motivation mechanisms' (2.81) and 'Resources allocation' (2.24) by EMIS coordinators, they considered these factors to have had least influence on EMIS outcomes. These findings confirmed that, 'Resources allocation' and 'Motivation mechanisms' were the least influential organizational factors on EMIS outcomes as indicated by the Data capture personnel too. Interestingly, interviews with the DEOs and Regional EMIS coordinator were in the contrary concerning resource allocation. They were unanimous that computers and some funds were put in place to facilitate the success of EMIS. One DEO emphasized that; "the funds were used for servicing computers". However, the DEOs identified four broad categories of challenges: "Inadequate funding, late disbursement of funds, technical incompetence, limited staff and some schools do not remit the correct data". To this effect one DEO opined that; "the EMIS personnel are not motivated, they do the work grudgingly and many are unwilling to work." while another DEO said that "the EMIS

personnel are mostly motivated if money is set aside to facilitate the data capturing process since this was not their core duty.” But the Regional EMIS coordinator felt that the EMIS personnel who had been sponsored for training were motivated, however not so much, as the MOE no longer pay for the keying in data as was the case when the programme was first introduced.

A significant difference was noted that while, Data Capture Personnel indicated that ‘Decision making structures & management style’ (3.30) was the second most influential organizational factors on EMIS. Whereas according to the EMIS coordinators, ‘Decision making structures & management style’ (2.92) was the third least influential factor, a view which was supported by a DEO’s comment that: “Bureaucracies involved in decision making militate against effective observation of deadlines in EMIS”. In an interview with the Regional EMIS coordinator, he explained that: “The decision making process for EMIS is mainly up bottom approach, the headquarters develops what should be implemented and this is communicated to the lower offices.” This was evident when another DEO said that: “In many occasions we emphasize to the heads of institutions in our meetings the necessity and urgency of EMIS data, this has helped us to meet our deadlines in data capture.”

The observed ‘high influence’ of EMIS outcomes by management support and managerial EMIS/ IT in (Table 2) was in agreement with findings from interviews

with the Regional EMIS Coordinator's opinions. For example when the Regional EMIS Coordinator was asked; “how has your experience and knowledge in EMIS and ICT assisted you to facilitate EMIS”, he commented that; “My experience and knowledge in EMIS and ICT assisted me to facilitate EMIS and I have been able to sort out less complex technical issues in EMIS data capture for example installation of the system.” However, there was a general observation from the DEOs that due to inadequate sensitization (30.4%) and incompetence in ICT (40.7%), it has made it impossible for them to effectively manage EMIS data, but having realized the meaning and importance of EMIS, they have decided to set aside a computer to be used in EMIS.

Taking all the factors together, the influence of organizational factors on EMIS outcomes was low ($M=2.96$) however with high Standard Deviation of 1.28 depicted a view of the respondents being so varied.

Relationships between organizational factors and EMIS outcomes

To show the relationships between the organizational factors and EMIS outcomes, further statistical analyses in the form of Pearson’s moment correlation was done. The analyses were based on the responses on the five organizational factors in Table 1 and the six EMIS outcome variables in Table 2.

Table 3: Pearson product correlation between EMIS outcome and organizational factors n = 97.

Table 5. Pearson product correlation between EMIS outcome and organizational factors (n = 57)							
Dependent Variables (EMIS Outcomes)	Independent Variables (organizational factors)						
		Timeliness	Relevance	Completeness	Reliability	Accessibility	Satisfaction
Management support	r	.542*	.572*	.402	.311	.372	.615*
	p	.021	.020	.062	.086	.064	.004
Decision making structures & Management Style	r	.391	.346	.236	.568*	.193	.494
	p	.074	.067	.072	.015	.270	.067
Managerial EMIS/ IT knowledge	r	.435	.411	.598*	.607*	.396	.623*
	p	.096	.108	.004	.002	.125	.023
Resources allocation	r	.615*	.372	.592*	.472	.458	.341
	p	.004	.062	.023	.018	.067	.094
Motivation mechanisms	r	.411	.458	.608*	.388	.341	.336
	p	.092	.043	.002	.064	.094	.072

r – Pearson correlation coefficient

p – significance level

* Correlation is significant at the 0.05 level (2-tailed).

The result in Table 3 shows that positive and strong relationship existed between management support and timeliness ($r = .542$, $p = 0.021$), relevance ($r = .572$, $p = 0.020$), personnel satisfaction ($r = 0.615$, $p = 0.004$). This meant that Management support contributed significantly to timeliness, relevance of EMIS data and user satisfaction. However no significant relationship was

depicted between “Management support” and completeness, reliability and accessibility of EMIS data. Decision- making structures & Management Style had a significant positive relationship with reliability ($r = .568$, $p = 0.015$) of data alone. Neither did Decision making structures & Management Style, have any significant effect on timeliness, relevance, completeness,

accessibility nor personnel satisfaction at $p = 0.05$. This signifies that Decision-making structures & Management Style had the greatest contributor to the poor EMIS outcome as it was noted in Table 1.

There was a significant relationships between Managerial EMIS/ IT knowledge and completeness ($r = .568$, $p = 0.015$) reliability ($r = .607$, $p = 0.002$) and satisfaction ($r = .623$, $p = 0.023$). Resources allocation contributed significantly to EMIS outcomes like; timeliness($r = 0.615$, $p = 0.004$), completeness ($r = 0.592$, $p = 0.023$) and reliability ($r = 0.472$, $p = 0.018$). There was

no significant relationship between resources allocation and accessibility($r = 0.458$, $P = 0.067$), relevance ($r = 0.372$, $p = 0.062$) and personnel Satisfaction($r = 0.341$, $P = 0.094$). Motivation mechanisms contributed only to completeness of data significantly ($r = .608$, $p = 0.002$), but had weak no significant relationship with the rest of the five EMIS outcome variables.

Multiple regression analysis was used to test if the organizational factors significantly predicted EMIS outcomes. The results were as shown in Table 4.22.

Table 4:Linear Regression Model Summary of organizational factors and EMIS outcomes.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.428	0.183	0.179	.46757

a. Predictors: (Constant), Motivation mechanisms, Management support, Managerial EMIS/ IT knowledge, Decision making structures & Management Style.

Table 4 gives the linear regression model summary of organizational factors and EMIS outcome which shows that coefficient of determination (R^2) was.183. This indicates that all organizational factors explained a significant 18.3% proportion of the variance in EMIS outcomes. In other words, 18.3% of the variance in EMIS

outcomes was accounted for by the motivation mechanisms, management support, managerial EMIS/ IT knowledge and decision making structures & management style; rest of 81.7% is explained by other factors not mentioned in this regression model.

Table 5: ANOVA test for organizational factors and EMIS outcomes^a.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.694	5	.539	2.464	.042 ^b
	Residual	13.554	62	.219		
	Total	16.248	67			

a. Dependent Variable: EMIS outcomes

b. Predictors: (Constant), Motivation mechanisms, Management support, Managerial EMIS/ IT knowledge, Decision making structures & Management Style

The ANOVA results in Table 5 shows that two organizational factors significantly predicted EMIS outcomes ($F(5, 67) = 2.464$, $p = 0.042$).

Table 6:Regression Analysis for effect of organizational factors in EMIS outcomes n=97.

Model		Coefficient coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.764	0.29		12.979	.000
	Management support	0.292	0.07	0.295	4.171	.001*
	Decision making structures & Management Style	0.081	0.075	0.083	1.080	.086
	Managerial EMIS/ IT knowledge	0.034	0.044	0.036	0.773	.143
	Resources allocation	0.283	0.086	0.286	3.291	.004*
	Motivation mechanisms	0.092	0.074	0.094	1.243	.067

Table 6 shows Regression results which indicated that two of the five organizational variables were statistically significant at 0.05 levels. Specifically, the variables 'Management support' ($t = 4.171, p = .001$) and 'resources allocation' ($t = 3.291, p = .004$) were a statistically significant predictors of EMIS outcomes. While, the variables 'Decision making structures & Management Style' ($t = 1.08, p = .086$), 'managerial EMIS/ IT knowledge' ($t = .773, p = .143$) and 'motivation mechanisms' ($t = 1.243, p = .067$) were not statistically significant predictors of EMIS outcomes. It can also be seen from the data in Table 6 that 'management support' (beta = 0.295) was the highest predictor of EMIS outcomes followed by 'resources allocation' (beta = 0.286).

DISCUSSION

The results show that organizational factors significantly predicted EMIS outcomes; organizational factors explained a significant 18.3% proportion of the variance in EMIS outcomes. However individual organizational factor had differential contribution levels. Consistent with other studies by Saunders and Jones (1992), Ang et al. (2001a) and Lawrence (2010) studies, the data from Nyanza region suggested that Management support was the most important organizational factor that influenced EMIS outcomes. Management support emerged to be the most influential (Table 2) and the greatest and significant predictor of EMIS outcomes (Table 6). In addition Pearson's moment correlation revealed that management support contributed significantly to timeliness, relevance of EMIS data and user satisfaction (Table 3). This finding corroborates the finding of Ang et al. (2001a) and Lawrence (2010) which documented positive effect of top management support on the

outcome of Information System in Malaysian Public Sector.

Similarly, King and Teo (1996) and Jarvenpa and Ives (1991) found that managerial support of an IS system is imperative in determining its successful outcomes. Two arguments could support the reason behind the influence of EMIS outcomes by Management support. First, King and Teo (1996) argue that since the top management authorizes funds, secondly they are the implementers of the IS, they would be eager to reap positive results to ascertain whether their decisions were correct and fruitful. However no significant relationship was depicted between "Management support" and completeness, reliability and accessibility of data (Table 3). In addition, absence of legal provisions to guard against misinformation by heads of learning institutions that provided inaccurate data to suit their unique circumstances (Republic of Kenya, 2012).

Young and Jordan (2009) would agree with Hwang et al. (2012) results and concluded that top management support amongst organizational factors is the most critical factor to Information systems' implementation success. Similarly, Hussein et al. (2007b) documented positive effect of involvement and participation of the top-level management of the organization in IT/IS activities in their study of e-government agencies in Malaysia.

Whereas 'resource allocation' had been viewed to have had low influence on EMIS outcomes from the analysis of the responses in the rating scale (Table 2), the regression results proved that 'resource allocation' (beta = 0.283) was a significant predictor of EMIS outcomes (Table 6). This discrepancy may be attributed to large variability in the standard deviation. According to Hwang et al. (2012), though the high influence of organizational factors like resource is generally recognized, their effect has been characterized as

situational and their effect may be moderated by other variables.

But still the correlation results showed that resources allocation contributed significantly to EMIS outcomes like; timeliness, completeness, reliability and relevance of data (Table 2). No wonder, 'Relevance of information' followed by 'Reliability of information' were the best EMIS outcomes in the Nyanza region (Table 1). These findings on resources allocation support the previous work of Gaible (2008), Wixom and Watson (2001), Hua and Herstein (2003) and Ang et al. (2001a) which showed that resources allocation was a fundamental factor in the IS success. In their review of integrated data and information systems and their implications in educational management at Harvard University, Hua and Herstein (2003) pointed out that availability of sufficient funds; appropriate people and enough time have positive effects on EMIS project's outcome. Gaible's (2008) experience in Jamaica and Trucano's (2006c) study in Nigeria revealed that early EMIS work in those countries were incomplete and not sustained, partly due to lack of resources and high costs associated with acquisition, operation and maintenance of ICT infrastructure. In fact, Gaible (2008) attributed impediments in the process of acquisition of ICT infrastructure to protracted procurement procedures, differing accounting systems, and priorities by donors and inter-ministry coordination. Furthermore, some researchers, such as Hua and Herstein (2003), and Hwang et al. (2012) have observed that implementation of information systems is usually resource intensive, but the results are often less than satisfactory due to organizational factors.

Wixom and Watson (2001) also found significant relationship between resources and IS implementation. They observed that having sufficient funds, appropriate people and enough time have had positive effects on project's outcome. Hussein et al. (2007b) found resource allocation to be related to system quality, information quality, perceived usefulness and user satisfaction. However, there was no significant relationship between Resources allocation and accessibility, and personnel Satisfaction. Hussein et al. (2007b) observed that, the Malaysian government had allocated a huge amount of fund in the national ICT projects. Hua and Herstein (2003) noted that EMIS activities have been frequently funded initially through one-off disbursements by donor organizations with little hope of funds for sustainability thus prevent realization of the anticipated goals. Therefore, according to Wixom and Watson (2001), having sufficient funds, appropriate people and enough time has had positive effects on project's outcome. This is consistent with other studies such as Hussein et al. (2007b), which observed that, the Malaysian government had allocated a huge amount of fund in the national ICT projects and most of which succeeded. In deed Hussein et al. (2007) found resource allocation to be related to system quality, information quality, perceived usefulness and user satisfaction.

A significant difference was noted that while, Data Capture Personnel indicated that 'Decision making structures & management style' was the second most influential organizational factors on EMIS, to the EMIS coordinators, 'Decision making structures & management style' was the third least influential factor, a view which was supported by a DEO's. This discrepancy may be due to bottlenecks brought about the three-tier-decision making structure within MOE, leading to time delays in actualizing EMIS activities. It is worth noting that decision making structure at the MOE in Kenya is a hybrid of a centralized system at the MOE headquarters and decentralized to county-level, DEOs offices and school level. Following O'Reilly and Pfeffer's (2000) assertion that highly centralized organizations tend to have more bureaucratic traits, it could have been possible that feedback from institutional heads on the EMIS was hardly ever sought by MOE headquarters, yet thrust of implementation of any education policy lies with institutional heads (Digolo, 2013). Indeed this argument is supported by Gaible's (2008) observation that lower tier authorities may complain about their participation in EMIS managed by a central governmental authority, especially where there is no history of sharing information and receiving anything useful in return.

Inconsistent with other studies by Hussein et al. (2007), Saunders and Jones (1992) and Ang et al. (2001a) regression analysis of, the data from Nyanza region suggested that decision making structures & Management Style was not a statistically significant predictor of EMIS outcomes (Table 6). Hussein et al. (2007), Saunders and Jones (1992) and Ang et al. (2001b) found management style to be highly correlated to information system's reliability and usability, information relevance, timeliness and user satisfaction.

Evidence by Bento and Bento's (2006) and Ang et al. (2001a) studies, considered decision-making style to be related to three critical outcomes of IS; information quality, effectiveness, and usefulness. However, the findings of the current study do not support these previous researches; neither did it find decision making structures. In this study, decision making structures & Management Style only had a significant positive relationship with reliability. This signifies that 'Decision Making Structures & Management Style' had greatly contributed to the poor EMIS outcome in Nyanza Region (Table 1).

While Hussein et al. (2007) found successful outcomes of an IS in public sector environment which adopts the traditional style of centralized IS structure, Trucano's (2006c) on the other hand in Nigeria found that the development of standardised software augured well for state-level EMIS to provide comprehensive information in support of decentralised management. It seems that there is no conclusive evidence as to which of the decision making systems has effect on IS outcome (Trucano, 2006c), and since this study did not find decision making structures to be significant predictor of IS, it's only prudent to resort to collaborative management style amongst the central coordinating body, lower tiers

of management and stakeholders is crucial for EMIS success (Hua and Herstein, 2003).

Contrary to Ang et al. (2001a) and Hussein et al. (2007b) findings, this study did not find 'managerial EMIS/ IT knowledge' as a statistically significant predictor of EMIS outcomes (Table 6). Similarly, responses from Data capture personnel and EMIS coordinators revealed that managerial EMIS/ IT knowledge had 'low influence' on EMIS in the counties of Nyanza (Table 1). The non-significant relationship between managerial EMIS/ IT knowledge and the EMIS outcomes could be ascribed to what Gaible (2008) referred as 'slow adoption of ICT policies in education sector by policymakers and lack of understanding of ICT issues'. Moreover, World Bank (2010) draws our attention to the fact that management information systems in the education sector are often designed by technical people, ignorant of prevailing educational policies and with insufficient input from education specialists.

Yet, according to Ang et al. (2001b) senior management experience, background and knowledge on IT, awareness and recognition of IS activities and potentials, has been found to have had an impact on successful IS outcomes.

This is in contrast with Hussein et al. (2007b) and Ang et al. (2001b) finding that managerial IT knowledge, awareness and recognition of IS activities and potentials, as well as their ability to plan strategically has an impact on successful IS outcomes. This finding implies that poor EMIS outcomes could have been accentuated by the managers' limited managerial EMIS/ IT knowledge. It was therefore not surprising that correlation results showed a non significant relationships between Managerial EMIS/ IT knowledge on key EMIS outcomes like timeliness, accessibility and relevance of data which has been illusive to attain (Republic of Kenya, 2009c).

Motivation mechanism is yet another organizational factor that this study did not find to be a significant predictor of EMIS outcomes (Table 6). They further indicated that 'Motivation mechanisms' were the least influential organizational factors on EMIS outcomes. (Table 2). In addition, it was not therefore strange to note that motivational mechanism was not significantly related to five out of the six EMIS outcomes apart from completeness of data (Table 6).

This suggest that Data capture personnel were less motivated than the EMIS coordinators and the funds were not readily available to support the activities of EMIS and therefore negatively influenced to EMIS outcomes leading to lack of timeliness, relevance, reliability, accessibility and personnel satisfaction. This finding was further augmented by the views of the DEOS that the personnel were not motivated, worked reluctantly and many are unenthusiastic to work given that they are expected to work overtime including weekends yet EMIS data capture was not their core duty, unless money is set aside to motivate them.

The differentials in response between Data Capture Personnel and EMIS coordinators on Personnel Satisfaction are of concern in this study. While Data

Capture Personnel indicated that 'Personnel Satisfaction' was the poorest and thus the least influential organizational factor on EMIS outcomes, the EMIS coordinators, 'Personnel Satisfaction' was the third best influential factor (Table 1). This disparity could be ascribed to the fact that the EMIS coordinators were the oversee officers for their EMIS activities and were directly responsible to the DEOs, they were therefore probably keen on viewing EMIS as a success, thus they could have felt shy to give a response of dissatisfaction even though the data capture personnel were dissatisfied.

CONCLUSION

This study investigated influence of organizational factors on Education Management Information Systems in Nyanza Counties, Kenya. It was revealed that study on the influential organizational factors of EMIS outcomes in the Sub counties of Nyanza region were management support and resources allocation. The low EMIS data capture completion rate at the DEOs offices in Nyanza region was symbolic of leadership factors affecting EMIS outcomes. Specifically, decision making structures & Management Style, managerial EMIS/ IT knowledge and motivation mechanisms had low influence on EMIS outcomes. It emerged from this study that EMIS outcomes in Nyanza was poor especially with respect to data completeness, data accessibility, personnel satisfaction and timeliness of data.

RECOMMENDATIONS

- a) The EMIS personnel Staff should be well facilitated to carry out EMIS activities effectively and efficiently.
- b) The process of data capture should be decentralized to the individual learning institutions from the DEOs offices then transmitted directly to improve timeliness. This would reduce the bulk of work of data capture at DEOs office by the limited number of EMIS personnel.
- c) The Ministry of Education and its agencies should provide ample opportunity for consultation with experts in the field of EMIS and other stakeholders to arrive at adequate consensus on the modus operandi to avoid duplication of data collection.
- d) Continuous EMIS staff development programmes and sensitization of educational managers should be done to improve managerial EMIS/IT knowledge.

REFERENCES

- Ang, C. L., Davies, M. A. & Finlay, P.N. (2001a). An Empirical Study of the Use of Information Technology to Support Total Quality Management. *Total Quality Management*. 12 (2): 145-157.
- Ang, C. L., Davies, M. A. & Finlay, P.N. (2001b), An Empirical Model of IT Usage in the Malaysian Public

- Sector. *Journal of Strategic Information Systems*. 10(3): 159-174.
- Ariko, C. O. (2014). "Impact of Selected Factors on Education Management Information Systems Outcomes in the Counties of Nyanza Region, Kenya." Unpublished Master of Education Thesis, Maseno University.
- Bento, A. & Bento, R. (2006). Factors Affecting Performance Management Systems. *Journal of Information Technology Management*. 17(2):1042-1319
- Burch, J. & Grudnitski, G. *Information Systems: Theory and Practice*. (5th ed). New York: John Wiley, 1989. p3.
- Cohen, L., Manion, L. & Morrison, K. (2000). *Research Methods in Education* (5th ed.). London: Routledge/Falmer.
- DeLone, W. H. & McLean, E. R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*, 19(4): 9-30.
- Deming, W. E. (1986). *Out of the Crisis*. Cambridge, Massachusetts: Massachusetts Institute of Technology.
- Dong, L., Neufeld, D., and Higgins, C. (2009) Top management support of enterprise systems implementations, *Journal of Information Technology*, 24, 55–80.
- Education Management Information System (EMIS) *EMIS: Needs Assessment Report*.
- Gaible, E. (2008). Survey of ICT and Education in the Caribbean: A summary report, Based on 16 Country Surveys. Washington, DC: infoDev / World Bank. Available at <http://www.infodiv.org/en/Publication.441.html> Retrieved on 11th June 2011 at 9.45am.
- Grover, V. (1993). An empirically derived model for the adoption of customer-based inter-organizational systems. *Decision Sciences*, 24(3), 603-639.
- Havelka, D. (2002). *User Personnel Factors That Influence Information System Development Success*, Miami University, IACIS
- Hua, H. & Herstein, J. (2003). "Education Management Information System (EMIS): Integrated Data and Information Systems and Their Implications in Educational Management, Harvard University." *Annual Conference of Comparative and International Education Society*. New Orleans, LA.
- Hussein, R., Selamat, M. H., Anom, R. B., Shahriza, N., Karim, A. & Ali, M. (2007b). The influence of organizational factors on information systems success in e-government agencies in Malaysia. *Electronic Journal on Information Systems in Developing Countries*. Available at [http://kmap2005.vuw.ac.nz/papers/the impact of org](http://kmap2005.vuw.ac.nz/papers/the%20impact%20of%20org) Retrieved on 11th June 2011 at 9.45am.
- Hwang M. I, Lin, C.T and Lin, J. W. (2012). Organizational factors for successful implementation of information systems: disentangling the effect of top management support and training. *Proceedings of the Southern Association for Information Systems Conference, Atlanta, GA, USA March 23rd-24th, 2012*
- Hwang, M.I. and Schmidt, F.L. (2011) Assessing moderating effect in meta-analysis: A re-analysis of top management support studies and suggestions for researchers, *European Journal of Information Systems*, 20, 6, 693-702.
- Jarvenpa, S., & Ives, B. (1991). Executive Involvement and Participation in the Management of Information Technology. *MIS Quarterly*. 15 (2): 205-227.
- Kelegai, L., & Middleton, M. (2004). Factors influencing information systems success in Papua New Guinea organisations: a case analysis. *Australasian Journal of Information Systems*, 11(2): 57-69
- King, W. R., & Teo, T. H. (1996). Key Dimensions of Facilitators and Inhibitors for the Strategic Use of Information Technology. *Journal of Management Information Systems*, 12(4): 35-53.
- Kingdom of Cambodia (2008). *Ministry Of Education, Youth and Sports. Education Management Information System (EMIS)*. Country Workshop on Statistical Capacity Building Phnom Penh Hotel, 20 March 2008, Phnom Penh, Supported by ADB RETA 6333
- Krejcie, R. V. & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.
- Lawrence, J. (2010). "The Factors that Influence Adoption and Usage Decision in SMEs: Evaluating Interpretive Case Study Research in Information Systems" *The Electronic Journal of Business Research Methods*, 8(1) 51-62. Available at www.ejbrm.com Retrieved on 19th July 2011 at 10.36am.
- O'Reilly, C. A. & Pfeffer, J. (2000). *Hidden Value*. Boston: Harvard Business School Press.
- Okiy, R.B. (2005). *Strengthening Information Provision in Nigerian University Libraries through Information Communication Technologies*. The Electronic Library 23.3: 311-318.
- Republic of Kenya. (2009a). Ministry of Education: Education Management Information System, Facilitator Guide for EMIS Training on May 2009. Nairobi: Ministry of Education.
- Republic of Kenya. (2009b) Training on Education Management Information System. Nyanza Team District Level Data Management at Tom Mboya Labour College from 15th to 19th June 2009.
- Republic of Kenya (2009c) Ministry of Education Letter dated 4th June 2009. EMIS TOT Training 7th to 12th June 2009. Nairobi: Ministry of Education.
- Republic of Kenya. (2009d). EMIS Kenya, Education Facts and Figures 2002 - 2008. Nairobi. Ministry of Education.
- Republic of Kenya. (2010a). EMIS Kenya, Education Statistical booklet 2003 – 2007. Nairobi. Ministry of Education.
- Republic of Kenya. (2010b). Ministry of Education Letter Ref no. AC/EXP/25/VOL.VIII, Authority to Incur Expenditure. Ref .No. R31-9060-2010/2011 dated 20th August 2010.

- Republic of Kenya. (2010c). Ministry of Education, Ref No. MOE/EMIS/P/7/11. 2009 EMIS School Census Data Management and EMIS Team Technical Support.
- Republic of Kenya. (2012). Ministry Of Education. National Education Sector Support Programme (NESSP). Priorities and Proposed Sector Programme 2012/2013 - 2017/2018. Final Draft Five (15th November, 2012)
- Republic of Kenya. (2005b). "Ministry of Education Science and Technology. Kenya Education Sector Support Programme 2005 – 2010. Delivering Quality Education and Training to all Kenyans." Nairobi: Government Printer.
- Saunders, C. S. & Jones, J. W. (1992). Measuring Performance of the Information Systems Function. *Journal of Management Information Systems*, 8(4): 63-73.
- Sharma, R. & Yetton, P. (2011) Top management support and IS implementation: Further support for the moderating role of task interdependence, *European Journal of Information Systems*, 20, 6, 703-712.
- Spratt J. & Crouch, L. (2001). EMIS Success in South Africa & Guinea: Insights from Practitioners. By, Rti Technologies at Work Techknowlogia, January/February, 2001 © Knowledge Enterprise, Inc. www.TechKnowLogia.org
- The World Bank. (2011). Education Management Information Systems (EMIS). Case Studies and Lessons Learned. The World Bank, Washington, DC. Available At: <http://www.Infodev.Org/En/Index>, Retrieved on 12th October 2010 at 10.30am
- The World Bank. (2010) Education Management Information Systems (EMIS). Case Studies and Lessons Learned. | Washington D. C., USA http://www.infodev.org/en/Page_ Retrieved on 12th October 2010 at 10.30am
- Transparency International Kenya (2010). The Kenya Education Sector Integrity Study Report 2010.
- Trucano, M. (2006a). *Education Management Information System: A Short Case Study of Mozambique. Working Paper No. 3, October 2006* Cambridge Education. (InfoDev). The World Bank, Washington, DC
- Trucano, M. (2006b). *Education Management Information System: A Short Case Study of Ghana. Working Paper No. 4, October 2006.* Cambridge Education. (InfoDev). The World Bank, Washington, DC
- Trucano, M. (2006c). Education Management Information System: A Short Case Study of Nigeria. October 2006 Working Paper No. 5, 2006 Published in February, 2006. <http://www.infodev.org/en/Document.503.pdf>. Retrieved on 12th October 2010 at 10.30am.
- UNESCO. (2006). Data Collection and Education Management Information Systems (EMIS) International Institute for Educational Planning 7-9 rue Eugene Oelacroix, 75116 Paris IIEP web site: www.unesco.org/iiep Retrieved on 12th October 2010 at 11.30am
- Wako, T. N. (2003). *Education Management Information Systems*. Harare, Zimbabwe. NESIS/UNESCO.
- Wixom, B. H. & Watson, H. J. (2001). An Empirical Investigation of the Factors Affecting Data Warehousing Success. *MIS Quarterly*, 25(1):17–41.
- Young, R. and Jordan, E. (2009) Top Management support: Mantra or necessity? *International Journal of Project Management*, 26, 7, 713-725.