Benefits and Bottlenecks of Information Communication Technologies in Enhancing Quality Education in Institutions of Higher Education in Kenya

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Abstract: *The inclusion of information communication technology (ICTs) in institutions of higher Education is a sure way of enhancing the quality of education in developing nations in the 21st century. As a developing Nation, Africa, stands to develop faster in all areas than ever before in particular, the E-Learning and ERP technologies have the potential to revolutionizing methods of data harnessing, implementation and management. Through these innovations, the quality of education shall concomitantly be enhanced. However, how well equipped is the African Country, Kenya, to better use Enterprise Resource Planning (ERP) within the ICT system in administering data gathering, implementation and management in institution of higher learning? These institutions offers training for Manpower Development required for Political Economic and Social Development of the nations and therefore are required to have better ICTs infrastructure to enhance quality education. Researchers of this paper addressed threefold objectives in institution of higher learning in Western Region of Kenya. The first objective was, ₊to establish the benefits of using ICTs in education management in higher learning institutions. Second objective was to find out bottlenecks, if any, of using ICT system in the management of data in institution of higher learning in higher learning institution of Western Kenya. The third objective was to outline strategies to alleviate challenges in the employment of ICT in higher institution of education in Western Kenya. The target population was the academic staff in institutions of higher Education that are directly involved in the management of Education, they were 325 in number. The sample for this study was, 60 (80%) CODs and Deans of departments and schools/faculties respectively; and 210 (84%) Lecturers. The study instruments were questionnaires and interviews schedules. The findings indicated that ICTs impacted on data flow and access of information that improved the quality of education in institutions of higher learning however incompetency and limited ICTs hindered the inclusion of ICTs in institutions of higher learning. Among the strategies that can be employed to alleviate challenges to ERP included training of the teaching personnel in using the advanced ICT software and giving the financial support to institutions of higher learning, Accordingly, we recommend that institution of higher learning should appreciate the benefits from using ICTs and advocate for their frequent use, emphasize on financial support by government and demystify ERP systems and their uses in institutions.*

Keywords: Benefits, Quality, Higher Education, Strategy, bottleneck and management

1. Introduction

The potential of technology to improve the quality of learning and teaching is undeniable. This potential has been indicated by numerous people. Valdez (2004) observes that technology offers many opportunities to improve learning and that it has the potential to provide people in their own homes and work settings with access to knowledge in very large universities. Furthermore, he argues that technology has the potential to make everyone a producer of original knowledge that can be shared with the world at very little cost. On its effectiveness in classroom practices. Franklin (2000) observed that technology in education may promote new learning environments in which enquiry and problem solving increase student achievement. The use of technology in education is one of the major trends in educational reforms all over the world. Integrating technology into the learning and teaching processes is widely perceived as a great assert in those reforms.

Hansen (2003) highlights the importance of technology in teacher preparation, pointing out three benefits. First, technology can be a powerful tool for helping individuals achieve personal and shared goals. Second, technology alleviates human suffering and promotes social justice to help people make a difference in their worlds. Third, people must have knowledge and skills to evaluate and decide appropriate courses of action when confronted with problems. According to Barron *et. al,* (2003), technology provides an excellent avenue for student motivation, exploration, and instruction in a multi sensory diverse world. They further argued that technology touches more aspects of our daily lives. They observe that the integration of technology into the institutions of higher learning curriculum is no longer a luxury, rather "it is a means to survival in the future that will be driven and supported by technology". In general, Barron *et.al,* (2001) reported the following benefits of integrating technology noting that technology promotes active learning, promotes critical thinking, offers diversity and self-paced learning and individual growth, motivates and inspires students by making

learning exciting and relevant, provides flexibility for students with special needs, promotes cooperative learning and increases teacher-student interaction, enhances communication skills, supplies information through multi sensory channels (supporting students with various learning styles and Helps students to build cultural bridges. (Baron *et. al*, 2001).

Further the 10 year report of the Apple Computer (1995) called the Apple Computer Classroom of Tomorrow (ACOT), the benefits of using computers were discussed and the tremendous impacts of using technology on student learning were outlined. Independent researchers in the project found that students in ACOT classrooms not only continued to perform well on standardized tests but were developing a variety of competencies not usually measured, they reported the following abilities of students developed from using technology asserting that students**:** explored and represented information dynamically and in many forms, became socially aware and more confident, communicated effectively about complex processes, used technology routinely and appropriately , became independent learners and self-starters knew their areas of expertise and shared that expertise spontaneously . There is no doubt that integrating technology is very valuable in the process of learning and appeals to many aspects of students' learning. Therefore, technology integration in education provides students with ample opportunities to benefit from and manage their learning while it facilitates the teaching process.

ERP software architecture that facilitates the flow of information among the different Functions within an enterprise facilitates information sharing across organizational units and geographical locations. It enables decision-makers to have an enterprise-wide view of the information they need in a timely, reliable and consistent fashion. ERP provides the backbone for an enterprise-wide information system. At the core of this enterprise software is a central database which draws data from and feeds data into modular applications that operate on a common computing platform an ERP system, data needs to be entered only once. A primary benefit of ERP is easier access to reliable, integrated information. A related benefit is the elimination of redundant data and the rationalization of processes, which result in substantial cost savings. The integration among business functions facilitates communication and information sharing, leading to dramatic gains in productivity and speed. Cisco Systems, for example, harnessed ERP to help it become the market leader in the global networking industry. Cisco's ERP system was the backbone that enabled its new business model Global Networked Business based on the use of electronic communications to build interactive, knowledge-based relationships with its customers, business partners, suppliers and employees. In the process, Cisco doubled in size each year and reaped hundreds of millions of dollars in both cost savings and revenue enhancements. Autodesk, a computer-aided design software company, reported a decrease in its order fulfillment times from two weeks to 24 hours after installing an ERP system. Similar examples abound in today's business environment. Based on the promise of tightly-integrated

corporate functions, globally optimized decisions and fast and easy access to accurate information, enterprise software has become an essential part of the operations of large businesses in many industries. The integrated information architecture would improve the quality of education.

However the use of ICT technology has bottlenecks, the implementation process of technology integration has been surrounded by skepticism concerning its effectiveness. Challenges to and gaps in technology integration have been identified and discussed by scholars based on different contexts. In the context of higher education in developing countries, despite notable progress, many challenges loom concerning the use of technology. The findings revealed that although there were significant efforts and positive attitudes toward the use of computers in learning and teaching, the process of technology integration at the university faced impediments that affected its effectiveness. The impediments included lack of enough computers, absence of sound computer knowledge and skills of teachers and students so as to effectively integrate technology into learning and teaching, absence of adequate and effective teachers' professional development programs on technology, and lack of effective technology planning and technology plans. The result of this study indicated that the four Ely's conditions of diffusion of innovations were not effectively met at the university and that the university's technology integration process was leveled at entry and adoption stages of ACOT's Stages of Development. Administrative support. Administrative support to teachers and students is very crucial in ICT teaching and learning processes. Administrators need to be interested, committed, and competent in many issues that involve ICT in education. Technical support (Sife *et. al,* 2007). He also argued that in most cases support is not available and that this was a prevailing problem in developing countries where there are few experts. On staff development, they argued that ICT integration does not only deal with introduction of new hardware and software, but both trainers and the students have to adopt new roles and change their ICT behaviors and ways of teaching and learning. Faculty staff members require training fundamentally in how people learn and in instructional design so staff training should be a continuous process of regular updates with the development of ICTs. They also observed that there were inadequate funds to enable the successful implementation and integration of ICTs in education.

2. Purpose of the study

The purpose of this study was to establish the benefits and bottlenecks of information communication technologies in enhancing quality education in institutions of higher education in Kenya.

3. Objectives of this study

a) To establish the benefits of using ICTs in education management in higher learning institutions

b) To find out bottlenecks, if any, of using ICT system in the management of data in institution of higher learning in higher learning institution of Western Kenya.

c) To outline strategies to alleviate challenges in the employment of ICT in higher institution of education in Western Kenya.

4. Method

A descriptive survey design was employed in this study. According to Mugenda and Mugenda (1999), the method is suitable because it measures the characteristics of a large population and yields a great deal of information which is not manipulated. This enabled the researcher to gather information that can be used to describe the existing conditions in school management. According to Wiersma (1995) this research design involved collection of data at one and only point from a random sample representing some target population. The design measured change when the defined group reflects change. In this design the treatment is included by selection rather than manipulation (Orodho, 2003). The characteristics of the design are relevant to this study because, the incidence, relationship and distribution of variables are studied. The variables were not manipulated but studied as they occur in a natural setting. The research design was typical for this study because the design worked to find out occurrences, relationship and distribution of ICT facilities in institutions management and how the factors influence their management.

Data Collection Instrument
The methods of data collection included the Questionnaire, Observation, Interview Schedules and document analysis. A Questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms. This instrument give the respondent adequate time to give well thought answers hence large samples can be made use of and the results obtained are dependable and reliable (Kothari,2003). Five categories of questionnaires used. The Questionnaire is easy to administer and more time saving compared to other tools like Interview Schedules, Tests and Observation (Mugenda and Mugenda, 1999). it was designed to seek information concerning the benefits of using ICTs in education management in higher learning institutions,

bottlenecks, if any, of using ICT system in the management of data in institution of higher learning in higher learning institution of Western Kenya and e strategies to alleviate challenges in the employment of ICT in higher institution of education in Western Kenya.

The Interview schedule was used along with the principal's questionnaire. It was a follow up to the questionnaire because principals may not have the time to fill the questionnaire fully. The selection of this tool was necessitated by the nature of data to be collected, the time available and the objectives of the study. The research was mainly concerned with; views, opinions, perceptions, feelings and attitudes of the respondents and therefore sure information can be best collected through this technique. (Mugenda and Mugenda, 1999).

Observation Schedule is where information is sought by way of investigators own direct observation without asking from the respondent (kothari, 2003). It was used to find out ICT facilities and programmes in the institutions. This is appropriate since it eliminates subjective bias, if done accurately. The information obtained through observation relates to what is currently happening and it is not complicated by either the past behavior or future intentions or attitudes and lastly the method is independent of the respondent's willingness to respond and as such is relatively less demanding of active co-operation (Kothari, 2003).

The researcher reviewed secondary data. The data reviewed included the inspection report on the integration of ICT in institutions management.

5. Results and Discussion

Objective one: To establish the benefits of using ICTs in education management in higher learning institutions.

ICT use has so many benefits in education management such as enhanced and quick communication and a well coordinated management system with limited mistakes. Table 1 shows some of the benefits the are accrued from the use of ICTs in improving the quality of education

Table 1: The benefits of ICT in the Management of higher education as Reported by the respondents

Respondents	Benefits in management								Total
	Improved Communication		Accurate Services		Quick Access		Improved Coordination		
	f	%	f	%	f	%	f	%	
CODs	12	40	7	23.3	7	23.3	4	13.3	30 (100%)
Deans	13	43.3	8	26.7	5	16.7	4	13.3	30 (100%)
Lecturers	71	33.8	50	23.8	49	23.3	40	19	210 (100%)

The findings from the table show that most of the 12(40.1%) of the CODs while 7(23.3%) of the indicated that there was accurate services offered and quick access of information with the use of ICTs, Then 13(43.3%) of the deans and 71(33.8%) of the lecturers indicated that there was improved communication in their institutions while only 8(26.7%) of the deans and 50(23.8%) indicated that there was accurate

services offered. however 4(13.3%) of the CODs and deans indicated improved coordination of activities in higher institutions. This implies that the benefits of ICT propelled institutional management to think of placing the ICT facilities in the strategic position of management in order to enhance quick communication, have efficient management and quick service delivery. The findings of the current study are similar

to those of Lavigne, (1996) ICT who established that ICTs gave institutions of higher learning many benefits such as efficient communication making it easy to use and keeps the management updated and that ICTs Standardized documentation and made information availability to be easily accessed from any computer and that information is searchable means that it is very easy to facilitate the sharing of information.

Objective two: To find out bottlenecks, if any, of using ICT system in the management of data in institution of higher learning in higher learning institution of Western region of Kenya.

Table 2: bottle necks of using ICT in institutions management as reported by the respondents

Respondents	bottle necks of integrating ICT in school management						Total
	Inadequate funds		Incompetence		inadequate time		
	f	%	f	%	f	%	
CODs	19	63.6	9	30.3	2	6.1	30 (100%)
Deans	26	84.8	3	9.1	2	6.1	30 (100%)
Lecturers	52	23.8	112	48.5	64	27.7	210 (100%)

Table shows that inadequate funds was the major constraint as reported by 19(65.6%) of CODs, 26(84.8%) of Deans and 52 (23.8%) of the lecturers. Incompetence in the use of ICT was high amongst the respondents but least among the lecturers and 3(9.1%) lack of time or the overcrowded curriculum was greatly witnessed among the lecturers 64(27.7%). Most of lecturers, 112(48.5%) found incompetence to be the main constraints on the integration of ICT in school management. This could be attributed to that fact that most institutions do not have huge investments and income generating activities and instead Schools mainly rely on fees paid by parents which at times is not enough to buy the ICT facilities. The incompetence among the academic staff was due to lack of training in the basic computer skills at college level. This coupled with the overcrowded curriculum and inadequate time contributed to the inability to integrate ICT in institutions. This could be interpreted to mean that institutions face a lot of challenges in integrating ICT into its management. This coupled with finance made integration to be very minimal. The findings of the current study agreed with those of Mangesi, (2007) indicated that inadequate finance and incompetence were the bottlenecks for the ICT-based programs that could not survive after the donor money ran out. Many ICT-based education programs funded by aid agencies or by corporations could not be sustained because the government failed to step in with necessary financing nor were the local communities in a position to generate the resources needed to continue these programs.

Objective three
To outline strategies to alleviate challenges in the employment of ICT in higher institution of education in Western Kenya. The study sought to establish the strategies to be employed to alleviate the challenges encountered by institutions of higher learning and the findings are shown in table 3

Table 3: in servicing training on ICT Integration as reported by the respondents

Respondents	Refresher courses				Total
	Yes		No		
	f	%	f	%	
CODs	27	90.0	3	10.0	30 (100%)
Deans	22	73.3	8	26.7	30 (100%)
Lecturers	70	33.3	140	66.7	210 (100%)

Findings from the table indicated that majority of 27(90.0%) of the CODs reported that they had not undergone in-service training, also the most of deans 22 (73.3%) reported that they had undergone in-service training and 70(33.3%) of the lecturers reported that they had undergone in-service training while. 3 (10.0%) of CODs reported that they had not undergone the in-service training. also 8(26.7%) of the deans reported that they had not undergone in-service training and 140 (66.7%) of the lecturers reported that they had not undergone the in-service training. The interview schedules with the school administrators concurred with the administration position that the MOEST offered limited refresher courses/ trainings on the integration of ICT in school management. This reflected some laxity on the part of the administrators on integrating ICT since they are the determinants of policy implementation in the school. The study revealed that there is still inefficiency and ineffectiveness in the integration of ICT in school management.

6. Conclusions

The conclusions made were based on the findings of the study .The study found out that institutions had integrated ICT on a limited scale. Institution managers were partially competent in the use of ICT in institution management, the use of ICTs in institutions management were minimal and the institutions that had the ICT facilities witnessed their effects on quality of education and lastly, the institutions had serious challenges in the integration of ICT. From this, it is therefore inevitable to conclude that the top level management has an important role to play in integrating ICT in institutions. It can also be concluded that if the cost implications of ICTs can be considered in relation to the output, then the quality of education will out do it. Quality in education brings with it a lot of benefits such as improved academic performance, enhanced technology which are pre-requisite in the world of economics.

The integration of ICT in enhancing quality of education is limited and most institutions have not completely embraced it. The integration of ICT in institutions still faces resistance from most institutional heads who would not wish some information to be known by other levels . The MOE should therefore come up with a clear policy and put in place measures in order for the institutions to completely integrate ICT to enhance the quality of education . Finally it can be concluded that the literacy levels and ICT infrastructures availability can collectively lead to enhanced quality of education.

7. Recommendations

1) There is need for more ICT facilities to be integrated in institutions to stream line communication, record keeping and the general performance of the institutions.
2) Institutions managers should create an enabling environment for ICT use.
3) In servicing in and out of the institutions should be encouraged so as to increase the use of ICT competence.
4) More finances should be set aside by the MOE specifically for purchasing ICT facilities and even allow donations from non-governmental organizations so as to support the use of ICTs in promoting quality in education

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