ICT Adoption in the Educational Management of Primary Schools in Kenya

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Abstract Information Communication Technology (ICT) plays an important role in enhancing the quality of education. The adoption of ICT for educational management in developed countries has significantly transformed the education sector in terms of data storage, resource management, and decision making. In African countries, initially, the use of ICT in management of schools was low compared to other fields such as business and engineering, however, in recent times, school managers have embraced ICT in the education sector. In the case of Kenya, through the ministry of education, the Kenyan government has made deliberate attempts to encourage the use of ICT to revolutionize the management of schools, which is evident through the introduction of National Education Management Information System (NEMIS), putting in place an ICT policy and creation of institutional websites. However, very few primary schools have effectively adopted ICT for management with a majority using it for teaching and learning. This is attributed to a myriad of challenges facing most schools and consequently resulting in slow and low adoption rates despite its promise and potential for improving educational management in schools. As such, this paper analyses the slowness that has surrounded the adoption of ICT in the management of Kenyan schools. The focus is on the benefits of introducing ICT in educational management, the current status of ICT adoption in educational management in Kenya and barriers to the adoption of ICT in educational management of primary schools in Kenya.

Keywords ICT Adoption, Educational Management, Primary Schools, Kenya, Barriers

1. Introduction

In the past, little attention was focused on the use of Information Communication Technology (ICT) for educational management than its use in teaching and learning. Nevertheless, rapid growth in the global economy and technological advancement has pressurized the education institutions to use ICT not only for teaching and learning but also for managing school operations [1]. Since ICT has become an essential part of everyday life, its integration in education is inevitable and cannot be avoided. The term ICT is an extension of the term Information Technology (IT) that emphasizes the role and integration of communication to aid users' access, storage, transmission and manipulation of information. In this paper, ICT is defined as all technological gadgets which include but not limited to computers and the internet used to communicate, create, manage, store and disseminate information [2]. The term basic education in the Kenyan context is defined as formal schooling that begins at the age of six running through the age of fourteen. Based on the 8-4-4 Kenya national education system, it is equivalent to primary education that lasts for eight years.

The adoption of ICT has contributed positively to the educational management of schools [3] with education institutions attesting a high success rate in using ICT for resource planning and management. In a study by the European Commission in Cyprus secondary schools, the researcher observed that secondary schools in Cyprus integrated ICT as a teaching tool as well as a tool for personnel, students, resources, financial and general management. Many developed countries such as Malaysia have formulated ICT strategies and policies for managing their education system [4]. In African countries, the use of ICT in the management of schools was initially low compared to other fields such as business and engineering. Consequently, the African population missed out on the benefits of ICT use in the management of schools. However, in recent times, school managers have seen the need to integrate ICT in the management of the education sector. This is evident with new project developments and

announcements of initiatives related to ICT for education (ICT4E) on an almost daily basis somewhere on the continent [5]. However, its expansion and adoption are challenged by lack of effective ICT policies, lack of infrastructure and financial constraints [5]. As such, the introduction of ICTs in the education sector and the overall transformation of the African Education System (AES) in some of the African schools has the potential of widening the digital divide.

In Kenya, the government encourages the use of ICT as a tool to revolutionize management in schools, enhance more effective organizational structures, create stronger links with the community and empower learners with skills necessary for independent learning. The government of Kenya recognizes the positive impact of ICT in making the country a middle-level economy as is envisaged in Kenya vision 2030 [6]. Through the Ministry of Education, the government of Kenya has made deliberate attempts to actualize vision 2030 by introducing the National Education Management Information System (NEMIS) which collects data and information from education institutions aimed at tracking performance mobility of learners and teaching staff to ensure efficiency and effective utilization of education resources. Also, it has put in place an ICT policy that guides ICT integration in the education sector. Further, it has put a lot of emphasis on the creation of institutional websites to catalyze access to institutional information, ease student registration process and acquisition of results. Despite the effort made by the Kenya government through the Ministry of Education, the use of ICTs in management of the primary schools is greatly underemphasized. This is attributed to a myriad of challenges facing most schools and consequently resulting in slow and low adoption rates despite its promise and potential for improving educational management in schools. The few primary schools that have adopted ICT, use computers for learning and teaching basic computer skills. Therefore, a more holistic approach requires that educational managers in primary school be receptive and open to technological changes [7], provide technological support and visionary leadership [8] for purpose of improving the quality of education and resource utilization.

This paper is organized as follows; Section II explains the benefits of introducing ICT in educational management, section III discusses the status of ICT adoption in management of schools in Kenya, section IV explains major barriers to the adoption of ICT in management of primary schools in Kenya and section V concludes by suggesting strategies that education manages in Kenyan schools can embrace for effective adoption of ICT.

2. Benefits of Introducing ICT in Educational Management

In the recent past, there has been a rapid increase in the use of ICT in educational management. This is attributed to its efficiency and effectiveness in managing educational data. Initially, ICT was purposely used to automate school office activities such as data entry and storage. However, the power of ICT to aid in analysis, planning, and decision making has changed the perception of a majority of school managers who now view ICT as a valuable tool. School managers who used to spend a lot of in resource allocation, monitoring, planning and decision making have the option of implementing Management Information Systems (MIS) that can help deal with complex problems [9]. In Kenya through the ministry of education, the government attempted to achieve this by introducing the National Education Management Information System (NEMIS) meant to ensure efficiency and effective utilization of education resources by tracking the performance mobility of learners and teaching staff. However, the system failed due to a myriad of challenges.

ICT in educational management is used to overcome the barriers of distance and time and significantly improves the accessibility of information and knowledge. Studies by Becta [10] indicate that information is made available to parents and the public at large through central administration websites and in some cases through direct access to central databases by school personnel.

Education institutions deal with a vast amount of student and staff information ranging from records of student accounts, students' performance and progression, staff mobility, and performance. The sensitivity and of this information requires a well maintained and established system of record keeping. The era of keeping records in manual files has been overtaken by time, therefore, school managers desire a tool that makes storage of this data safe and easily available. ICT is a valuable tool for storing and analyzing data on education indicators such as student performance, physical and human infrastructures [11] which saves a lot on physical files since it is replaced by electronic files [1].

It is a desire for any school manager of an educational institution to be able to effectively manage institutional resources. Institutional resources can be both physical infrastructures and members of staff. ICT software such as Management Information System (MIS) can ease tracking and analyzing resource distribution and expenditure. Additionally, school managers can fully track the performance and mobility of their staff. According to Gavua et al [12], MIS has contributed a lot to efficient educational management.

3. Status of ICT Adoption in Educational Management in Kenya

The use of ICTs in the education sector for management is designed for reporting, monitoring, tracking, alerting parents, timetabling and communication, all of which if

used properly can result in educational development. Kenya has made remarkable progress in facilitating ICT adoption in the education sector, even though the entire process is marred with a series of challenges. For instance, most secondary schools in Kenya have computer equipment though very few are installed with ICT infrastructure. In most cases acquisition of computer equipment and ICT infrastructures has been through initiatives supported by parents, the government, development agencies and private sector, including the New Partnership for African Development (NEPAD) E-schools program [13]. Attempts to set up ICT infrastructures in primary school is almost negligible.

A report by the Ministry of Education (MoE) on national ICT strategy for education and planning [14] cited that access to ICT facilities is currently one of the major challenges in Africa, and Kenya is no exception. While the ratio of one computer to 15 students is the norm in most developed countries, the ratio in Africa stands at one computer to 150 students. This ratio is even wider in disadvantaged regions. In Kenya, the ratio for university and colleges is one computer to 45 students, one computer to 120 students at secondary school level while access at the primary school level remains much more limited at one computer to 250 students. Besides, it is noted in the Education Policy Framework (EPF) that there are several challenges concerning access to and use of ICT in Kenya. These include high levels of poverty that hinder access to ICT facilities, limited rural electrification, and frequent power disruptions.

In a report on ICT education in Kenya Farrell [15] reported that the Ministry of Education developed a Kenya Education Sector Support Program (KESSP) in 2005 that featured ICT as one of the priority areas to mainstream ICTs into the teaching and learning process. The National ICT Policy embedded this intent as a national priority and provided the impetus for the ministry to develop its sector policy on ICT in Education.

The EMIS Survey (2003/2004) indicated that over 70% of secondary schools and a much larger proportion of primary schools require functional telephones. Indeed, many parts of Kenya cannot easily get Internet services because of poor telephone networks. About 90% of secondary schools need to establish standard Local Area Networks (LANs) to improve the sharing of learning resources.

4. Barriers to the Adoption of ICT in the Educational Management of Primary Schools in Kenya

Despite the Ministry of education through the Kenyan government being committed to implement ICT in education, the process is hindered by many challenges. The most outstanding barriers being political barriers, poor planning, corruption and shortage of infrastructure. Below is a discussion of the fore mentioned barriers.

4.1. Political Barriers

Political goodwill plays a very important role in the development of a country. In a study carried out to try and understand barriers in using technology for education among developing countries, Sharma [16] noted that one of the most prominent barriers is the lack of political goodwill of the rulers of a country. In most developing countries allocating sufficient funds for the education sector and ICT does not seem to be a priority or is not attractive enough to the leaders of the country. This is evident in the way developing countries prefer a big budgetary allocation for defense forces than the education sector [17]. In the context of Kenya, issuing laptops to primary school pupils was a viable project, however, faced with challenges of lack of teachers with ICT skills and lack of electricity by most schools, it did not get government goodwill in tackling the challenges which lead the project to crush. The whole laptop project was seen as a campaign strategy meant to channel jubilee political ambitions to power. Therefore, there is a need for the government to prioritize and focus on rural electrification which will ensure primary schools in the remote area have access to electricity and embark on massive and comprehensive training of primary school teachers in ICT use.

4.2. Poor Planning

A popular adage often attributed to Benjamin Franklin states that "failing to plan is planning to fail." The absence of proper planning can detrimentally affect the timely delivery of project deliverables. For effective implementation of ICT in the educational management of schools, there is a need for both the government and education institutions to have a fixed vision and plan. In the context of the laptop project for primary schools in Kenya, teachers lamented that the entire project was ill-timed and poorly planned. They mentioned that other pressing issues needed immediate attention than attempting to buy a laptop for every child. Langat [17] cited critical issues such as child care, providing conducive and secured classrooms, hiring more teachers and motivating existing teachers by increasing their pay. Other critical issues that could have been considered before rolling out the laptops include ensuring electricity installation especially in schools in remote areas and training the primary teachers in preparation for using the laptops. Also, Langat [17] noted that most of the ICT programs introduced are not based on a need assessment and market demand instead they are directly copied from foreign countries and end up lacking in context.

4.3. Corruption

Corruption in the educational management of schools

threatens the wellbeing of a society because it erodes social trust and worsens inequality [18]. It also affects policymaking, planning and financial management and procurement procedures in schools. For instance, in the case of Free primary education in Kenya. In 2009, an audit report revealed that senior government officials and headteachers had misappropriated Free Primary Education (FPE) money and subsequently, donors suspended funding through the government of Kenya in 2010 and started channeling the funds to multilateral agencies and non-governmental organizations [19]. In Kenya corruption is also evident in the allocation of resources to the education budget, leaving the sector under-resourced. Also, corruption in Kenya is seen in the award of sh. 24.6 billion tender to Olive Telecommunication which was later canceled by the public procurement review board for lack of financial capability [17].

4.4. Shortage of Infrastructure

Effective implementation of ICT requires the availability of equipment, supplies of computers and their proper maintenance including accessories [20]. Some of the equipment includes hardware, software and telecommunication in form of computers, scanners, digital cameras, phones, faxes, modems, CD and DVD players and recorders, digitized video, radio, and TV programs [17]. However, most Kenyan primary schools in rural areas lack electricity, while some use sheds of trees as classrooms. In areas where electricity is available, the school managers are faced with the challenge of lack of internet access or low-speed internet access which is a requirement for updating software and integrating ICT into teaching and learning situations. Even though the Kenya government set out to implement rural electrification as a way to empower rural populations mainly in education and health, it was faced with challenges of vandalism of power line, high connection fees and inadequate funds [21].

5. Conclusions

Use of ICT in the educational management of schools is a relatively new research area that requires before school managers adopt it, they should have an in-depth understanding of its benefits, challenges accompanied by its adoptions and the effect it may pose on school processes. In Kenya, primary schools have great potential to tap the benefits of adopting ICT in managing operations in the education sector. Even though the Kenyan government has put measures geared towards ICT adoption, there are marred with challenges of implementation. For instance, through the Ministry of Education, the government of Kenya developed an ICT policy that is meant to guide ICT integration in the education sector. However, the development of the policy did not involve local experts and

did not create an enabling framework for effective adoption. This resulted in the policy not matching with school cultures which made some schools reject its implementation. Also, there should be ICT policies that target the specific level of the institution. For instance, an ICT policy that would stimulate the effective adoption of ICT in educational management would be compulsory training for primary school managers and administrators in the use of ICT based management tools. By so doing, the future generation of school managers and administrators would be highly trainable in using ICT in the educational management of schools. Therefore, there is a need to develop comprehensive and forward-looking ICT policies that create an enabling framework for effective adoption of ICT in the educational management of schools. Also, there is a need for a more holistic approach that will make the school managers and administrators more receptive and open to the changes ICT may make.

In general, Kenya as a country is not badly off in the effort to encourage and implement ICT adoption for educational management in schools. The government has set up initiatives to harness the potential accrued with the use of ICT. This is seen in its initiative through the ministry of education to develop an ICT policy to guide ICT integration, development of a Kenya Education Support Programme (KESSP) that featured ICT as a priority, introducing the National Education Management Information System (NEMIS) which was meant to ensure efficiency and effective utilization of education resources by tracking performance mobility of learners and teaching staff and encouraging school mangers to implement Management Information Systems (MIS) that can help deal with complex problems. Therefore, as a developing country, there is evidence of some effort channeled towards this venture. However, for the adoption process to be effective, the government has a role to play concerning materializing the implementation strategies and enacting policies that support and drive forward the adoption process.

REFERENCES

[1] S. Ghavifekr, M. Afshari, and S. S. & K. Seger, "ICT Application for Administration and Management: A Conceptual Review," *Procedia - Soc. Behav. Sci.*, vol. 103, pp. 1344–1351, 2013.

[2] B. Tonui, E. Kerich, and R. Koross, "An Investigation into Implementation of ICT in Primary Schools, in Kenya, in the Light of Free Laptops at Primary One: A Case Study of Teachers Implementing ICT into Their Teaching Practice," *J. Educ. Pract.*, vol. 7, no. 13, pp. 12–16, 2016.

[3] C. R. Oyier, P. A. Odundo, G. K. Lilian, and K. R. Wangui, "Effects of ICT Integration in Management of Private Secondary Schools in Nairobi County, Kenya: Policy Options and Practices," *World J. Educ.*, vol. 5, no. 6, pp.

14–22, 2015.

[4] G. Simin, A. Mojgan, and S. Amla, "Management Strategies for E-Learning System as the Core Component of Systemic Change: A Qualitative Analysis," *Life Sci. J.*, vol. 9, no. 3, pp. 2850–2856, 2012.

[5] A. A. Barakabitze *et al.*, "Transforming African Education Systems in Science, Technology, Engineering, and Mathematics (STEM) Using ICTs: Challenges and Opportunities," *Educ. Res. Int.*, vol. 2019, 2019.

[6] A. M. Mutisya, J. M. Mwania, and D. M. Mulwa, "The influence of school-related factors on ICT integration in the management of public secondary schools in Kitui County, Kenya," *Eur. J. Educ. Stud.*, vol. 5, no. 11, pp. 193–204, 2017.

[7] D. E. J. Kipsoi, D. J. K. Chang'ach, and H. C. Sang, "Challenges Facing Adoption of Information Communication Technology (ICT) In Educational Management in Schools in Kenya," *J. Social. Res.*, vol. 3, no. 1, pp. 18–28, 2012.

[8] D. N. A. Hayes, "ICT and learning: Lessons from Australian classrooms," *Comput. Educ.*, vol. 49, no. 2, pp. 385–395, 2007.

[9] M. Shah, "Impact of Management Information Systems (MIS) on School Administration: What the Literature Says," in *5th World Conference on Educational Sciences*, 2014, vol. 116, pp. 2799–2804.

[10] A. Jones, "A Review of The Research Literature on Barriers to the Uptake of ICT by Teachers," *Br. Educ. Commun. Technol. Agency*, vol. 1, no. June, pp. 1–29, 2004.

[11] S. Al-Senaidi, L. Lin, and J. Poirot, "Barriers to adopting technology for teaching and learning in Oman," *Comput. Educ.*, vol. 53, no. 3, pp. 575–590, 2009.

[12] E. K. Gavua, S. Okyere-dankwa, and M. Offei, "The Importance of Management Information Systems in Educational Management in Ghana : Evidence from Koforidua Polytechnic," *Int. J. Innov. Technol. Explore. Eng.*, no. October 2018, 2016.

[13] H. O. Nyagowa, D. N. Ocholla, and S. M. Mutula, "The influence of infrastructure, training, content, and communication on the success of NEPAD'S pilot e-Schools in Kenya," *Inf. Dev.*, vol. 30, no. 3, pp. 235–246, 2014.

[14] MoE, "National ICT Strategy for Education and Training," 2006.

[15] G. Farrell, "ICT in Education in Kenya," 2007.

[16] R. Sharma, "Barriers to using technology for education in developing countries," *Proceedings, ITRE 2003 - Int. Conf. Inf. Technol. Res. Educ.*, no. 1990, pp. 521–522, 2003.

[17] L. A. Chris, "Barriers Hindering Implementation, Innovation, and Adoption of ICT in Primary Schools in Kenya," *Int. J. Innov. Res. Dev.*, vol. 4, no. 2, pp. 1–11, 2015.

[18] B. M. Kirya, "Education sector corruption : How to assess it and ways to address it," 2019.

[19] J. Odero, "Educational Corruption in Kenya's Free Primary Education Program," *Sundaram J. all Subj.*

[20] C. K. Clement, "Barriers To the Introduction of ICT Into Education in Developing Countries: the Example of Bangladesh," *Int. J. Instr.*, vol. 5, no. 2, pp. 61–80, 2012.

[21] Z. O. Ayieko, "Rural Electrification program in Kenya," *AEI Pract. Work.*, no. November, p. 27, 2011.