EFFECTIVE EDUCATIONAL TECHNOLOGY INTEGRATION THROUGH CAPACITY BUILDING: INEXORABLE MODERNIZATION OF THE KENYAN EDUCATION SYSTEM

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Education is vital for laying a solid foundation for national development of every nation in the world. Information communication and technologies (ICTs) are rapidly spreading to every corner of the world. In the 21st century, the field of education is progressively taking advantage of ICTs to enhance teaching and learning by efficiently and effectively distributing knowledge. Kenya, like many other developing nations, is in need of teachers who are equipped with educational technology knowledge for effective technology integration into teaching and learning so as to modernize her education sector. This paper is a review of literature on teacher capacity building as a way of effectively integrating in teaching and learning process. This will be linked to teacher capacity building, in Kenyan context, in order to identify responsive areas of strategic interventions that will modernize the education system.

Keywords: Capacity Building, Integration, Educational Technology

Introduction

Technology is part of our daily lives today. Each technology discovery is a step towards development of mankind. In the current times technological advancements have spread far and wide on earth and many people are using the new technologies. It is now imperative to equip the entire society with the knowledge of the new inventions in technology. Information and communication technologies (ICT) are permeating the education sector and they are being used to enhance the teaching and learning process using modern delivery techniques. Therefore, ICTs should be universally acknowledged as an important catalyst for social transformation and national progress in the Kenyan education system (Kirimi, 2014). The Kenya Vision 2030 (GOK, 2007) asserts that ICT could be used to propel the country to a middle level economy by improving security, lowering cost of doing business and providing Kenyans with a friendly working environment among others. Specific strategies were to include improving the quality of education by providing quality teachers, space and technology for knowledge delivery (Mingaine, 2013). However, despite the strategies developed by the government on implementation of ICT in schools, research have established that many of them are not effectively using ICT to support learning, teaching, research and management as intended by Kenya National ICT policy (Mingaine, 2013). Meoli (2007) revealed that despite efforts made by various stakeholders and the importance of ICT in education sector, the National ICT policy has to a large extent remained in draft form. Little attempt has been made to implement the policies to schools. This called for the need to analyze teacher capacity building as one of the ways to effectively integrate technology in order to modernize Kenya’s education system. It is the teachers who represent centripetal force in most educational systems worldwide and their performance is inextricably linked to educational outcomes for both learners and the system alike (Egbo, 2011). To capacity build the teachers on technology integration in their teaching and learning is a sure way to improve the educational outcomes and ensure that Kenyan education system is modernized.
Capacity Building as a Concept

Capacity building is a concept that has different meanings to different people. According to Lusthaus, Adrien and Perstinger (1999), capacity building is to enhance or strengthen a person’s or organization’s capacity to achieve their goals. Coutts (2003) states that capacity building entails upgrading the abilities and resources of individuals, organizations and communities to achieve a certain goal. In a similar manner, Linnell (2003) describes capacity building as activities that improve an organization’s ability to achieve its mission or a person’s ability to define and realize his/her goals or to do his/her job more effectively. Philbin (1996) talks about the concept of capacity building as a process of developing and strengthening the skills, instincts, abilities, processes and resources that individuals, organizations and communities need to survive, adapt and thrive in the fast changing world. United Nations Environment Program (UNEP) (2006) defines capacity building as “the process by which individuals, groups, organizations, institutions and societies increase their abilities to perform core functions, solve problems, define and achieve objectives; and understand and deal with their development needs in a broad context and in a sustainable manner”. Therefore, capacity building has to do with building abilities, relationships and values that will enable organizations, groups and individuals to improve their performance and achieve their developmental objectives.

The United Nations Committee of Experts on Public Administration (2006) explained that capacity building takes place on an individual level, institutional level and societal level. On an individual level, it requires the development of conditions that allow individual participants to build and enhance existing knowledge and skills. It also calls for the establishment of conditions that will allow individuals to engage in the process of learning and adapting to change. On an institutional level, it involves aiding pre-existing institutions and supporting them in forming sound policies, organizational structures and effective modes of management. At the societal level, capacity building supports the establishment of a more interactive public administration that learns equally from its actions and from feedback it receives from the population at large. Capacity building at individual level will be of more focus since teachers in Kenya’s primary and secondary levels are the focal point for effective educational technology integration as a way of modernizing the education system. According to UNEP (2006), capacity building on an individual level has three different dimensions namely: building awareness, building analytical capacity and building decision-making capacity. Building awareness involves offering activities, presenting new topics or demonstrating new methods through workshops, seminars and conferences. The presentations are meant to create awareness about a particular activity, topic or method so as to enable beneficiaries apply them in performing assigned tasks. Building analytical capacity involves designing a capacity building program using interactive style of presentation. It uses exercises, case studies, field visits and other elements of experiential learning, which promote critical thinking among the beneficiaries. Building decision-making capacity also has to do with laying emphasis on learning-by-doing as well as formal education. The beneficiaries are exposed to professionals to receive training on project completion. By so doing, the beneficiaries acquire learning-by-doing experiences. Therefore, for effective educational technology integration demands for teacher capacity building during the pre-service training as well as in-service training for they are the one to implement it in the classroom. Thus, capacity building is an integral part of strengthening educational institutions and providing enabling conditions for premium performance by the individual teachers within the education sector (Solomon & Ofori, 2014). Supporting this, Mati (2008) asserts that capacity building is as important as capital investment and infrastructure. UNESCO (2006) emphasize that capacity building in education is “important both for the functioning of the education system as well as for capacity building in other sectors…an essential aspect of capacity
building is enhancing the ability of individuals, institutions and systems to cope with change and unforeseen challenges”. According to Pelgrum (2001), the success of educational innovations depends largely on the skills and knowledge of teachers. Teachers’ lack of knowledge and skills is one of the main hindrances to the use of ICT in education both for the developed and underdeveloped countries (Mamun & Tapan, 2009; Pelgrum, 2001; Ihmeideh, 2009; Williams, 1995). It is therefore necessary to appreciate that teacher-building capacity in our institutions is, ultimately, bringing about development, growth and excellence in Kenya’s education system.

Modes of Capacity Building for Teachers
A wide range of approaches is available to capacity building including training, formal education, capacity building projects, networking and others (UNEP, 2006). Reimers (2003) explains that in-service training usually consists of workshops or short-term courses that would offer teachers new information on a particular aspect of their work. Stephen et al. (2006) mentioned that conferences, workshops, seminars, consultations, study tours, participatory research, on-the-job training, demonstration plots, coaching, and mentoring are the main methods to build the capacity of academic staff to guarantee a good mix of theory and practice.

On the other hand, Klasen and Clutterbuck (2002) mentioned that mentoring has been regarded as one of the learning methods used to enhance individuals learning and development in all spheres of life. Capacity building teachers through mentoring to possess the necessary sets of academic competencies can therefore have an immense impression on the effectiveness on educational technology integration into the Kenyan education system. It involves passing on skills, attitudes and knowledge from experienced teachers to the inexperienced teachers. Mentoring supports professional growth and renewal, which in turn empowers teachers as individuals and colleagues (Boice, 1992). Thus, as the protégés become empowered through the assistance of mentors, mentors themselves also feel renewed through the sharing of power and the advocacy of collegiality (Luna & Cullen, 1995). Mentors should have unparalleled skills in communicating, listening, analyzing, providing feedback and negotiating with less inexperienced persons. Eade (2007) asserts that as a mentor “you can’t build capacities in others that you don’t have yourself. And if you can’t learn, you can’t teach either.”

Effective Technology Integration and Teacher Capacity Building
Technology integration capacity building is key to teachers’ learning to integrate technology effectively into the classroom (CEO Forum, 1999). Teachers, as instructional designers and implementers, are very crucial for effective technology integration into the education system. Effective technology integration requires the time and attention of teachers in the role of instructional designers (Dexter, 2002). Dexter (2002) further asserts that it is the teacher who designs into the instruction any value that technology adds to the teaching and learning processes since educational technology itself does not possess inherent instructional value. Technology can neither substitute the teacher in the learning process nor have educational value without the input of the teacher. The teachers consider what they are to teach, what added value the technology might bring to the learning environment, and how technology can help to assess student’s learning process (Dexter, 2002).

It is therefore imperative that teachers must have frequent opportunities to simply learn how to operate the educational technology as well as learning opportunities that address more than these basic skills like emphasizing the entire instructional domain which involve pedagogy and models of implementation strategies (Dexter, 2002). Therefore during technology capacity building classroom teachers must have an opportunity to examine their
instructional objectives and develop an understanding of educational technology as an instructional tool. According to Dexter (2002):

Professional development targeted at successful technology integration at a school increases the effectiveness of technology by ensuring that teachers’ learning needs are met with both “how to operate” and “how to integrate” sessions. Because technology integration should be in support of specific outcomes and add value to and assist in the assessment of those outcomes, the professional development sessions would ideally be specific for grade levels and customized to match the outcomes they teach. This means that overall, curriculum connections should often be the central focus of technology professional development sessions and facilitate sharing or instructional planning time.

Effective technology integration is when it is used in a smooth way to support and extend curriculum objectives and engage students in meaningful learning (Dias, 1999). The instructional approach to integrate technology must involve prudent selection of technology according to the requirements of the content, framing learning objectives (Rogers, 2002).

Moersch’s (1995) six-level framework for technology integration also provides a hierarchy of steps leading to technology integration. The steps are as follows: (a) **Non-use**: There is perceived lack of access to technology-based tools or a lack of time to pursue electronic technology implementation. Existing technology is predominately text-based; (b) **Awareness**: Computer-based applications have little or no relevance to the individual teacher’s instructional program; (c) **Exploration**: Electronic technology is employed either as extension activities or as enrichment exercises to the instructional program; (d) **Infusion**: technology-based tools augment isolated instructional events; (e) **Integration**: technology is perceived as a tool to identify and solve authentic problems relating to an overall theme/concept; (f) **Expansion**: classroom teachers actively elicit technology applications and networking from business enterprises, governmental agencies, etc. to expand student experiences directed at problem solving, issues resolution, and student activism surrounding a major theme/concept; (g) **Refinement**: Technology is perceived as a process, product (e.g. invention, patent, new software design) and tool to help students solve authentic problems related to an identified real-world problem or issue.

Integration of technology is successful if technology does not stand out but is perfectly assimilated and easily used by both teachers and learners. This is against the occasional use of technology for obtaining information, analyzing and synthesizing the information and presenting it professionally (Harris, 2005). Effective educational technology integration in teaching and learning should aspire to enrich students’ learning, support teaching and reduce routine work for teachers. It should involve phases like designing suitable learning activities that apply ICTs to support varied requirements of the learners, planning strategies to handle technology and student learning, applying it for record keeping, developing effective classroom management strategies (A framework for training in-service secondary school teachers on ICT, 2010). Integrating technology is thus not about merely technology but it is primarily about content and effective instructional practices. Integration can therefore be defined not by the amount or type of technology used, but by how and why it is used (Earle, 2002).

**Technology Integration and Modernization of the Kenyan Education System**

The Kenya Government has embraced technology as a key to development. Like many developing countries, the education sector in Kenya is still in its infancy in the inclusion and utilization of educational technology. In order to effectively integrate educational technology properly to improve the quality of education, technology and teaching methods in education should go hand in hand.
The Kenyan Government has put in place the National ICT Policy that provides guidelines for transformation of the Kenyan into a digital society (MOE, 2006). The report further claims that the Government recognizes that a technology literate workforce is the foundation on which the nation will become a knowledge-based economy. Therefore, the government intended to make education a platform for equipping the nation with ICT skills in order to create dynamic and sustainable economic growth. On human resource development, the policy emphasizes integrating ICTs in teaching curriculum at all levels of education; establishing e-educational networks for sharing educational resources and promoting e-learning at all levels; encouraging and supporting ICT training for decision-makers, community and civil society leaders; creating opportunities and providing assistance for the disadvantaged, women and the youth to acquire ICT competencies and skills; and enhancing capacity for research and development in ICT sector.

Embedded in the National ICT policy is the education policy which calls for recognition of the fact that ICT provides capabilities and skills needed for a knowledge-based economy. The policy also appeals for transforming teaching and learning to incorporate new pedagogies that are appropriate for the 21st century MOEST’s mission which is to facilitate effective integration of technology to improve access, learning and administration in delivery education programs and services. The principal objective was to integrate ICT in the delivery of education and training curricula (MOE, 2006; Sessional Paper No. 1, 2005).

Integration of educational technology was to aim at supporting teaching and learning in the delivery of the various curricula to achieve improved education outcomes. The strategic objectives were: to establish model institutions that will be used to demonstrate integration of ICT to teaching and learning; to train at least 20 master integrators to support integration at the national and district levels and; to train teachers on integration techniques and sensitize education managers on ICT integration (MOE, 2006).

All the above was to be attained through training (capacity building and professional development). Training programs were to be intended for the education management sector comprising the entire MOEST, its agencies and institutional managers and the teaching staff force who comprise the primary school teachers and the secondary school teachers. This was to ensure that all levels of the education sector will be ICT-literate where the personnel have the capacity to improve the delivery of services and accountability and to make the information flow and data processing more efficient. For teachers will have the ability to improve teaching and learning in schools. However, the rapid changes in ICT demands continuous training at all levels.

Despite the ICT policy, not many schools in Kenya have effectively integrated ICTs to raise teacher efficiency. This can be attributed to a number of challenges facing many schools in Kenya with regard to embracing and implementation of ICTs in education. Most schools in Kenya have only adopted computers as technical subject and not integrated its use in the teaching and learning. As such, a more holistic approach requires that schools be receptive and open to the changes ICTs may make.

**Conclusion and Recommendations**

Effective educational technology integration is not only to operate technology and using it occasionally but requires time, training and practice. In Kenya, capacity building ought to begin in teacher training institutions where the teacher trainees can be introduced into activities like planning and developing strategies for using educational technology so as to improve the standards of teaching and learning. ICT has to be to fitted into the teacher education curriculum and facilitate instructions by teacher educators. Teacher educators need to ensure that the trainees regularly use technology and pass through the stages involving greater use of technology by the learners and finally proceed towards a phase when students
use technology for problem solving and collaborative learning, while teachers become facilitators. Knowledge of teaching by integrating ICT is implicit and therefore, trainees need to experience it and try it out during practice teaching and reflect upon it as a repetitive process as teacher educators guide them through the various stages of integration.

The pre-service teacher training should be built on and enhanced by in-service capacity building. This is because ICTs are rapidly developing technologies, teachers need to continuously upgrade their skills and keep abreast of the latest developments and best practices. Teachers need not be anxious of being replaced by technology or losing their authority in the classroom as the learning process becomes more learner-centered. Thus effective educational technology integration will be enhanced once teachers have had a deep understanding and a positive reception of their changing role.

Management plays a crucial function in the effective educational technology integration in education. School leaders should recognize that implementation of ICT in schools, is a necessary revolution of how teaching and learning is done, and a chance to entice students to the modern and better learning environment. In support of ICT integration programs to be effective and sustainable, educational leaders themselves must be skilled in the use of technology, and they must have a broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT use in education. For that reason, leaders should play a leading role in promoting teachers’ capacity building towards effective educational technology integration in education.

References


