

Information and Communication Technology skills for Effective Competence Based Curriculum Implementation in Kenya

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ABSTRACT

The vision of education service delivery in Kenya is to have an internationally competitive quality education, training and research for sustainable development. More developed countries are associated with their great investment in human capital. They are also associated with development of ICT which has led to improved standards of living and good governance. This study was carried out on 395 pre-school teachers who were undertaking their in-service training in Kiambu County. The study sort to establish ICT whether the teachers engaged in ECD centers had any skills in ICT. This study further sort to establish whether there was integration of ICT in teaching and learning in selected preschools in Kenya. A researcher designed questionnaire was used in the study. A total of 60.83 % of the total population had no knowledge of ICT and therefore did not integrate ICT in their teaching and learning in the selected preschools. All the teachers expressed that the government had not sponsored them for ICT training and the little they had they had sponsored themselves. Grounded on these findings the study recommended that the government should be on the forefront to not only invest in ICT infrastructure but also in education of teachers in ICT. With the paradigm shift in the Kenya's education curriculum this concern should be immediate. The government should take up the responsibility of ensuring that all teachers are exposed to ICT skills since these will change their interaction with the students who are quite ahead of their teachers in technology.

Key words: Early Childhood education (ECD), Information and Communication Technology (ICT), Pre-school teachers, Teacher Training, Competency Based Curriculum (CBC).

INTRODUCTION

Technology is one of the drivers of development for developing countries (Bahrini, Qaffas, Alaa 2019). Kenya is one of the developing countries that are taking a lead in adoption of technology and integrating that technology in its development agenda. Indeed, Kenya's government has incorporated ICT and internet connectivity as an engine for socio-economic growth and

development (Kevin, Sonny, Tigineh, & Sriram, 2017). Furthermore, in its attempt to meet her development goal, Kenya developed the Vision 2030. Vision 2030 was geared towards transforming Kenya's economy into a modern, globally competitive middle income country offering the quality life to its citizens by 2030. Education has been singled out in the social pillar of the vision 2030 as the best mechanism to lead the country to this desired end Michura, (2019). To ensure that this happens, it is essential that education is of highest quality. This has called upon the government not only to think the form of education to offer but also how it should be carried out.

Studies have shown that the quality of education is enhanced by adequate of ICT integration in teaching and learning. ICTs in education are potentially powerful tools for extending educational opportunities. They have a potential for increasing access to and improving the relevance and quality of Education (Gatotoh, Gakuu and Keiyo 2020; Rani, Khatter, 2019). Research has shown that increased levels of digital skills and practices and improved academic performance among students is as a result of support from their teachers (Argentin, Gui & Tamanin, 2013, Pagani & Argentin, 2015). The move in the 21st Century is geared towards digital media and information. Integration of ICT in education is therefore, a vehicle that can prepare the children to fit in this era. With the new system of education, CBC, the possible importance of ICT cannot be overemphasized. Kenya has identified the importance of ICT in its education system over time. For example, there was the emphasis in the Ministry of Education Science and Technology Option Paper No, 1 of 2005 and KESSP document on how the quality of education would be improved through e-content development and provision of computers in primary schools (Republic of Kenya 2005). This however is to witnessed in all schools in Kenya.

The importance of ICT in Education has been undisputed over time both in developed countries and in developing countries. ICT mastery and understanding of basic skills and concepts are now highly regarded by many countries (Rampersad, 2011). ICT has the ability of developing competencies needed for the current globalization (Bransford, Brown, and Cocking 2000). This is because ICT is able to motivate and help students to develop their knowledge and information (Hussein et. al 2011). Its importance to mankind has also been a global debate over time (Olaofe, 2005). This is because of its capacity to change the roles that teachers and students in teaching and the learning process (Njagi, 2013, Mungo, 2014). For example, ICTs has been found to provide a collection of powerful tools that will transform the former teacher centered method of teaching into an interactive student-centered knowledge based environment which is the current emphasis in CBC curriculum (Oketch et al 2014). Other researchers who have stated the importance of Integration of ICT in education include Wango (2009) who posits that the quality of teaching and learning can be enhance through improved teaching practices. Integration of ICT brings revolutionary changes in teaching methodologies. This innovation plays a major role as a contributor towards learner centred form of teaching and learning (Smaldino, Lowther, & Russell, 2012)

The move towards the global "Knowledge" economy also necessitated the use of ICTs. This is also confirmed by Akpan, (2003) who postulates that adoption of ICT in schools will not only accelerate national development but also facilitate globalization. With the demand of this type of economy, teachers are left without a choice but to integrate ICT in their teaching so as to empower learners in this digital era. The global economy has been reported to pressurize education systems not just in Kenya but around the world (UNESCO, 2012). This need further documented in the Ministry of Education Policy Paper of 2012.

In Kenya education is organized and reorganized by the government through KICD to fulfil individual and educational goals. Kenya's education system is undergoing a major transformation. The change is not just in the kind of curriculum that is being offered but also in the distribution of years that this will take place. The learners are expected to have two years of pre-primary, six years of primary education, and six years of secondary education. (2-6-6). The previous system had a distribution of years as follows: Eight years of primary education, four years of secondary education and four years of university education. The education curriculum is also being transformed from being teacher-centred to a student-centred curriculum which is also Competency Based Curriculum (CBC). Proponents of Competency-Based Curriculum (CBC) argue that by focusing on competencies or what learners can do with the education they have received, competency based curriculum is better suited to ensuring that education responds to the needs of society.

The CBC is geared towards nurturing every learner's potential, and also the 21st century demands citizens who are multi skilled. The new system seeks to produce a child with relevant competences to thrive in a rapidly changing world. This possible future is likely to be achieving through embracing ICT.

The new system was launched in 2017 and is yet to complete the full cycle. It is geared towards ensuring that students develop skills and knowledge that they will need to relate in their real life situation. This curriculum has been redesigned to incorporate a more personalized focus on the learner unlike the teacher-based curriculum which is being phased out. This curriculum will enable students to pursue their passions and interests unlike the past where they had to learn everything offered to them. One of the ways that these learners will unleash their potentials will be their interaction with ICT (Omariba, Ayot and Ondigi 2016). The government has invested in digitization of the educational materials through the Kenya institute of curriculum studies. It has also spent a lot of money in ICT infrastructure.

The only link to successful integration of ICT in teaching and learning seems to be in the development of teachers' skills and knowledge in ICT. Learners will need guidance from teachers who must be well equipped in the use of ICT in their teaching. This is because ICT associated with the capability of transforming the teaching learning environment to a dynamic and proactive one. (Arnseth & Hatlevik 2012). It is important therefore to equip teachers with the necessary skills and knowledge how to integrate the same in the new curriculum. Kenya's effort towards integration of ICT in major spheres of life is evident in the ICT policy of 2016 in which school managers are directed to integrate ICT in teaching and learning which will enable Kenya to achieve the vision 2030.

Although the need to have ICT integrated in teaching and learning has been put as one of the ways to improve the quality of learning, recent studies indicate that this dream is far from being achieved. A study carried out by (Kairu, 2013) indicated that there are still major challenges in Kenyan schools. The greatest challenge that hindered effective ICT integration in teaching and learning was lack of enough facilities. The study indicates lack of internet connectivity in most of the schools, lack of ICT infrastructures and lack of preparedness among the teachers in terms of training. (Kairu 2013).

A research by Sitienei, (2013) also confirmed that schools are not ready to adopt technologies for teaching and learning given that teachers were inadequately trained. The need to assess the preparedness for ICT integration in early childhood education necessitated this study. The objective of the current study was to establish the level of ICT training among early childhood teachers in Kenya.

LITERATURE REVIEW

Schooling should prepare the students for a life in the modern world that is driven by technology and technological innovations (Rafal 2014). ICT brings the changing of relationship within education. Traditional models of education turning into modern and analogue ways of communication are replacing to digital media, mobile learning, e-learning and computerized system through ICT. Along these more applications of ICT have included for reinforcement of education and these will continue to include up more to take out education from traditional model to modern model. The classes has become visual, time saving and student-centered which highly motivate the learners to engage in learning (Safi 2019).

Use of ICT should therefore be introduced to the children right from childhood through to their secondary school. This may not be possible if teachers are not deliberately trained to do this. Their traditional roles must of necessity fit in the changing trends. Most of the methods teachers used in the past will be obsolete which is learner centred and greatly enhanced with ICT.

With constantly increasing importance of technology in our lives and with the unavoidable expansion of ICT in classrooms, the role of the educator has to change. With ICT the teacher is no longer an educational authority that transfers knowledge to students but together with the students they become learners searching for knowledge (Safi 2019). It is important that teachers encourage critical thinking skills, promote information literacy and support collaborative work to prepare learners for living in the 21st century. For effective integration of ICT in the classrooms, it is important to ensure that all the teachers are equipped with the required ICT skills. Studies have shown that teachers who are use technology in teaching effectively are those who have undergone ICT training as opposed to those who had no training (Winzenried, Dalgarno and Tinkler 2010). These teachers should be knowing the significance and advantages of ICT to enable them conduct meaningful lessons by the use of ICT. Studies have not only quoted teachers as the major causes of lack of integration but Principals of different learning institutions (Ndiritu, Kidombo and Gakuu 2012).

When comparing traditional educational environments with teaching with ICT, studies have shown when ICT is integrated in teaching it has the potential to enhance modern teaching methods including mobile learning (Gatotoh, Gakuu & Keiyoro 2018; Karanezi, 2014). ICT has been found not only to assist students directly but also complete their learning tasks with ease (Gatotoh, Gakuu & Keiyoro 2018; Bietenbeck 2014). It also reduces the amount of instructions given without intervention of the teacher. Melita (2012) reports that technologies also have the potential to support the curriculum in ways that were not possible before.

Use of ICT among young children

Various researches have been done on technology and the effect it has on young children (Dirgas & Kokkalia 2014). Children have been found to develop better in the following areas as a result of

technology: socially, problem solving, reasoning and creativity and motor skills among others (Clements 1994). Other studies have also related technology with cognitive and social learning in children. This was confirmed by a study carried by Haugland (1992) who found that three to four-year-old children displayed better verbal and non-verbal skills and better problem solving skills when they used computers than those who did not use computers. Other researchers such as Booker's (2003) believe that early childhood education that is full of cooperative play and discovery learning lends itself to innovative and appropriate ways to use technology for this level.

In today's society, children have been described as the generation of digital natives (Hain, Li, & Tsai 2014). These modern children are growing up in world that has and is shaped by ICT (Siraj-Blatchford & Whitebread, 2003). Most of these children interact with a computer even before they go to school. This technology has changed the way these children think and learn. This then has caused the rethinking of learning theories and curricula. Indeed, early childhood education cannot ignore the impact of ICT in the modern child. All stakeholders now seek for better ways of integrating ICT into learning so as to make the modern child closer to 21st century expectations. The pressure to integrate ICT into learning seem to come from all sides, parents, business sector and all departs of education. In fact, many countries now regard understanding ICT and mastering its basic concepts as part of the core of education (UNESCO, 2002).

The positive relationship between use of technology and learning cannot be underestimated. Research however indicate that majority of In-service teachers have neither the skill nor the majority to use ICT in the classroom. Studies have shown that educational technology brings about positive outcomes among children. Concern has been however on the appropriateness of this technology to the developmental stages of these children. Care should therefore be taken to ensure that teachers are well equipped in ensuring that appropriate technology and content is integrated in teaching and learning. Indeed, research has also shown a positive relationship between educational technology and outcomes of children so long as this is age appropriate (McManis & Gunnewig, 2012). This view is also supported by O'Connor and Polin (cited in Flemming 1995) who assert that that ICT enhances knowledge and learning experience for both teachers and learners. Other studies have shown that learners using ICT show higher learning gains that those who don't. (Mikre, 2011).

The relationship between positive patterns and use of technology has been confirmed by Silvinkachala and Bialo (2000). This is because of the ability of technology to enhance individualized learning styles that the teacher helps in ensuring that each student achieves his/her individual goal. Although there are many positive aspects of ICT use with young children, a few issues have been pointed on its negative impact on them especially on safety. For example, Byron (2008), Stephen Plowman (2008) point out that ICT exposes children to harmful content, displaces other play activities and interferes with other cognitive, social and emotional development. This however could be out of a misconception of a child simply sitting with a computer in front of them in solitude. Hayes & Whitebread, (2006) hold that this view would change if people observe how different young children become after they interact with ICT in terms of their social interactivity and creativity.

Challenges for ICT integration in the classrooms

Several studies on why there is still limited integration of ICT in the classrooms have pointed to two major issues. Ertmer (1999) for example categorizes these barriers into first order extrinsic barriers and second order intrinsic barriers. He posits that the reasons why teachers don't integrate ICT in teaching and learning include: lack of proper training and professional development, shortage of time to lack about it and limited access to ICT infrastructure. Other researchers such as Al-Senaidi, Lin and Poirote (2009) agree on the first order extrinsic barriers that time taken to prepare to use ICT create a barrier in using it for teaching purposes. Accessibility of internet, and other technicalities like passwords all hinder teachers' integration of ICT in teaching and learning.

Ertmer (1999) called the second set of barriers second-order intrinsic barriers. These he said were emanating from the teachers themselves: the values, their principles and attitudes and their ability to use specific technology to promote deeper learning experience. Research by Parette, Quesenberry, & Blum (2010) assert that the fact that most teachers don't believe in the usefulness of ICT in learning is a major barrier to not use it.

Theoretical background

This study is based on Piaget's constructivist theory on knowledge and learning (Ultanir, 2012). This theory holds that learning is an active process where knowledge is constructed by meaningful experiences (Piaget 1975). This is relevant in the sense that technology tends to effectively engage the learner in learning activities. Piaget's constructive theory is based on the principles that advocate for children active participation in observations, hands-on experiences and their ability to relate their knowledge to real world situations. Piaget hand-on learning experiences and opportunity to relate this knowledge within real world situations. Piaget underscores the need for critical thinking skills for problem solving and decision-making. In a classroom where constructivist theory is adhered to, the teacher performs the role of a facilitator who is expected to engage the learners throughout the learning process.

In a constructivist classroom the most important component of the learning process is the learner while the teacher's role is of introducing the element of inquiry (Soujah 2014). Since the learner is expected to continually engage in activities to develop deeper understanding, this technology-enhanced instructional tools lends itself to constructivist learning theory. Multiple learning avenues are provided to the learners in the Constructivist learning environments in which the teacher provides the role of mentor. Facilitator and guide in the learning process. Various technology tools are also incorporated for active learning where constructivist pedagogies are adopted (Gallant 2000).

RESEARCH METHODOLOGY

The study utilised a descriptive survey research design. This design enable the researcher to achieve optimal results while utilizing a questionnaire to collect data (Fraenkel & Wallen, 2008, Gatotoh 2017). To determine the situation of ICT integration in the early childhood education, 395 teachers attending in-service ECD training in Nairobi were studied. The main aim of this study was to establish the role that the government was playing in enhancing ICT integration in ECD. Teachers were selected using the simple random sampling method. The research instrument used to collect

data was a questionnaire developed by the researcher. This was meant to elicit information on the teachers' skills in ICT.

RESULTS AND DISCUSSIONS

The established that a total of 60.83 % of the total population had no knowledge of ICT and therefore did not integrate ICT in their teaching and learning in the selected preschools. The findings of this study are consistent with the findings of Sang, Valcke, vanBraak, and Tondeur (2009) whose study results show that prospective ICT integration significantly correlates with teacher related variables, including constructivist teaching beliefs, teacher self-efficacy, computer self-efficacy and computer attitudes in education.

The study further established that majority of the participants although, engaged in early childhood education, and had not attended any training in ICT use in the classrooms. They also indicated that they had not received government support for such training, the few that had training has sponsored their basic ICT skill studies and therefore did not use ICTs in their day to day teaching.

"I have not received any ICT skills training ...I have no training on how I can use computers or other ICT devices for teaching in class..." ECD teacher 1

"I have not been formally trained on integrating ICTs in my teaching , however, I have trained myself basic computer skills...I have not received a government sponsored training for using ICTs for teaching and learning...I would be happy to receive such training..." ECD teacher 2

The findings of this study are consistent with (Mathevula, & Uwizeyimana, 2014) who conducted a study on challenges facing the integration of ICT in teaching and learning activities in South African rural schools some teachers had received some form of ICT training, it was evident that such training has had minimal or no impact at all on the abilities and confidence of teachers to use ICT in their teaching. Mathevula, & Uwizeyimana, (2014) argue that, there is need to deal the issue of training all teachers on use of ICT for teaching and learning by the various stakeholders.

CONCLUSIONS

Education has been regarded as the main instrument of all round development of all nations. As a major asset to bring about social, economic and political development, the quality of a country's education system should be enhanced. Since ICT has been associated with the required changes in development, it essential to recognize the role that teachers play in enhancing the acquisition of ICT skills. From the study findings it is evident that many teachers engaged in ECDE were not well equipped with adequate skills in ICT. For the Kenyan government to succeed in full integration of ICT in education, there should not only be plans to provide infrastructure but also to ensure that there are programs in which both practicing teachers and those in training are exposed to ICT skills.

RECOMMENDATIONS

The study recommends that the government invest more in equipping teachers with the necessary skills in ICT to be able to integrate the same in teaching and learning. This is especially urgent for successful implementation of the CBC curriculum and for the transformation teaching and learning using 21st century digital technology. With the paradigm shift in the Kenya's education curriculum this concern should be immediate. The government should take up the responsibility of ensuring

that all teachers are exposed to ICT skills since these will change their interaction with the students who are quite ahead of their teachers in technology.

It is also recommended that further studies be conducted in private-organized training institutions for comparison purposes. This study was limited to the use of questionnaires to gather information on the state of ICT among the ECD teachers. A research could be done to include other research instruments such as focus group discussions.

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