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Influence of Information Communication Technology on Child Education

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ABSTRACT

Purpose: The potential benefits of ICT integration in learning in schools have been extensively discussed in the academic literature worldwide. In recent years globally, there has been rapid expansion in integration of ICT in primary school education. Countries has further put in place many initiatives to enhance the same. Integration of Information and Communication Technology (ICT) is a critical factor in ensuring improved quality education. Despite the many benefits that are known to be brought by integrating ICT in teaching and learning, studies have shown that integration remains low especially in primary schools. The general objective of the study was to establish the influence of information communication technology on child education

Methodology: The paper used a desk study review methodology where relevant empirical literature was reviewed to identify main themes and to extract knowledge gaps.

Findings: The study found out that the influence of ICTs in learning cannot be dealt with in isolation. For technology to be effective, it must be availed to learners at the right time and place. There is need to be effective, it must be availed to learner's proximity; that is in classrooms or supposed learning environment

Recommendations: The study recommends that leaders need to adopt transformative leadership to achieve organizational performance. Organization should embrace transformational leadership and sound policies that will strengthen their position as a fundamental sector in generating human capital for the country's developmental and economic needs as well as the development of training programs in leadership skills and competences in transformational leadership for the leaders of enterprises

Keywords: *Information communication technology, child education*

INTRODUCTION

Background of the Study

Information and communication technology (ICT) plays a key role in promoting the economic development of a country. Many of the productive gains in the developed world economies over the past two decades (1990-2010) can, to a great extent, be attributed to the impact of ICT. According to a United Nations report (1999) ICT covers internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centers, commercial information providers, network-based information services, and other related information and communication activities. Asoma (2018) observed that education is at the core of the knowledge economy and learning society and that correspondingly, the role of ICT in the teaching and learning process in schools is increasing rapidly.

Information and Communication Technology (ICT) has become, within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy Wadi, (2020). ICT permeates the business environment, it underpins the success of modern corporations, and it provides governments with an efficient infrastructure. At the same time, ICT adds value to the processes of learning, and in the organization and management of learning institutions. The Internet is a driving force for much development and innovation in both developed and developing countries. Countries must be able to benefit from technological developments World Bank, (2016)

Technology is being utilized in various early childhood educational environments across the country. Although initial concerns by educators and parents were recognized about computer use among young children, later research proposed most of these fears were unfounded (Peas,2019). The implication is technology can be comfortably utilized in early childhood to supplement their growth and development by early exposure to the devices and shown alternative ways to interact with technology other than for recreational purposes. Technology has also been associated with increased motivation for children to learn. While there are positives to technology in the classroom, there are still some concerns by caregivers. Computers place parents in a dilemma regarding what is best for their children. Parents must make decisions on what their children can do and access while online. Which programs are suitable for the developmental level and must stay alert to any dangers these might pose (Aubrey & Dahl, 2014). Computers have become an essential tool in all sectors of the world. We use it for communication, news sources, shopping, and distance education: it is vital to embrace its use to prepare our children for future success. In 2016, the American Academy of Pediatrics (AAP) made recommendations about the use of technology by young children: specifically outlining both positive and negative effects on development. The plan, referred as The Family Media Use Plan (American Academy of Pediatrics , 2016), was intended to assist primary care providers for young children a healthy balance between technology use, and traditional learning experiences, taking into account the health, education and entertainment needs of each child (American Academy of Pediatrics , 2016). The primary recommendation was that caregivers need to prioritize times off the technological devices, encourage, and introduce children to socialized activities to promote 2 healthy holistic development. Caregivers should be thinking

proactively about the use of media with children between the ages of 18 months and five years of age. (Aubrey & Dahl, 2014). Children have a natural curiosity to learn about the world around them, and their interest in technology is no different from them learning to ride a bike or learning to tie their shoes. The inclusion of this type of learning tool has opened up an entirely new kind of discovery both to their immediate environment and the world as a whole. A verbalized concern from caregivers revolve around the safety for the children while online and interacting with the technology. Precautions such as limited time on the devices, and caregiver approved websites put in place to endure their safety. With these precautions in place children can have positive learning experiences without the harmful effect's technology has the possibility of causing.

Multimedia has had an enormous influence on education. For example, medical schools use multimedia-simulated operations that enable prospective surgeons to perform operations on a computer-generated 'virtual' patient. Similarly, students in engineering schools use interactive multimedia presentations of circuit design to learn the basics of electronics and to immediately implement, test, and manipulate the circuits they design on the computer. Even in elementary schools, students use simple yet powerful multimedia authoring tools to create multimedia presentations that enhance reports and essays. In recent years, technologies such as blogs, wikis, LinkedIn, Facebook and Twitter have been causing the next wave in technology facilitated learning. The new technologies allow unprecedented sharing and collaboration between users. Dron (2017) notes that one of the most distinctive features of social software is that control and structure can arise through a process of communication and group interaction. A mix of media each consisting and serving a specific purpose can teach. This means that, a strong print component can provide much of the basic instructional in the form of course text, as well as readings, the syllabus and the day to day schedules. Interactive audio/ video conferencing can provide real time face to face(or voice to voice interaction) while Computer conferencing or electronic mail can be used to send messages, assignment feedback and other targeted communication to one or more class members. In addition, pre-recorded videotapes can be used to present class lectures and visually oriented content. Fax on the other hand can be used to distribute assignments, last minute announcement, to receive student"s assignments and provide timely feedback Scheneiger (2017).

Although ICT is now at the center of education reform efforts, not all countries are currently able to benefit from this development and advances that technology can offer. Significant barriers often referred to as digital divide limit the ability of some countries to take advantage of technological development (Mertala, 2019). The developing countries are faced with challenges related to access, pedagogy or assessment when using ICTs to improve and reinforce education (Sargent, 2017). It is important to note that the concept, methods and application of the term ICTs are constantly evolving rapidly; starting from the popularity of the issue of computers in education in the 1980s, when relatively cheap micro-computers became available for the consumer market, later, near the end of 1980s the term was replaced by IT (Information Technology); signifying a shift of focus from computing technology to the capacity to store, analyze and retrieve information. This was followed by the introduction of the term ICTs (Information Communication Technologies) around 1992 when email and World Wide Web (Internet) became available to the general public (Scheneiger 2017). Though initially educators saw the use of ICTs in the classroom mainly as a way of teaching computer literacy, it has a broader role: that of delivering many kinds of learning

at a lower cost and with high quality than the traditional methods of teaching allow. In addition schools and universities increasingly use ICTs as do other large organizations, to reduce cost, improve efficiency and administration (Scheneiger, 2017).

There has however been a wide disparity between the levels of investments in developed countries vis-a-vis the developing countries. Srivastava (2018), nonetheless states that this disparity is not necessarily a bad thing as developing countries can learn from developed countries on ICT integration.One of the tasks of the modern school is to prepare students for life in the information society. Teachers should create an environment for students to acquire the ability to search, organize and use information from various sources and learn how to use information technology (IT) in a creative and productive way. This can be achieved by preparing students to use computers and IT as well as by using technology in the classroom with a variety of subjects, at all stages of education. The implementation of this task is a large and long-term project.

Changes in the education system should therefore take into account the changes that are taking place around us in society. One of the most important factors, which already has a huge impact on individuals, communities and entire societies is IT, which increases the possibility of active participation of citizens in the functioning of their communities. The national curriculum created by Skolverket acknowledge the importance of technology and requires the use of IT in all sectors of education since IT has become an integral part in many fields. The curriculum should take this into account. According to Johannson (2018) students should have access to the technology that is needed for a modern education. After compulsory primary school pupils should be able to use modern technology as a tool for communication, creativity and learning.

Statement of the Problem

While ICT continues to advance in Western and Asian countries, African countries still experience a lag in its implementation, and that continues to widen the digital and knowledge divides. In a recent study by Muleya (2021), observed that access to ICT facilities is a major challenge facing most African countries, with a ratio of one computer to 150 students against the ratio of 1:15 students in the developed countries. Moreover there have been concerns voiced by classroom teachers and parents that exposing young children to computers poses negative consequences. These concerns were confirmed by Selmi & Gallagher (2014) that stated long-term exposure to computers may result in learners with poor social skills and physical health because of lack of interaction with people in the physical world. Emotional, physical, and social skills are essential in young learners since they enhance their social understanding and motor competence. While those concerns are recognized, proponents of the technology believe information and communication technology (ICT) presents a new space for exploration and discovery to young children. Offering challenging activities to meet children's curiosity (Hatzigianni & Margetts, 2012). Because of the concerns, the study explored the positive and negative effects that technology in the classroom may cause. Technology in the classroom comes in many forms: computers, iPad, and adaptive technology for young children. Instead of looking at technology, the study emphasized iPad usage and the amount of time children are interacting with the device. Evidence of the negative consequences has been noticed for many years (U.S. Department of Education, 2016). The current study will bridge the gap between the positive and negative effect

of information communication technology and focus on the influence of information communication technology on child education.

Objectives of the Study

The general objective of the study was to establish influence of information communication technology on child education

Justification and Significance of the Study

The study findings may be used to facilitate the integration of ICT in the teaching and learning process by both teachers and students. This information may also be useful to administrators, policy makers and other stakeholders in education in determining the preparedness of schools in in terms of availability of appropriate ICT infrastructure for child learning. Also, may be used as a baseline data for laying strategies on increasing the level of ICT integration in countries. The study may further indicate the capacity building gaps which may be useful in formulating framework to empower ICT users in integrating ICT in school curriculum. The study findings will be significant to the teachers because it might be an eye opener in imparting ICT skills and in promoting computer literacy among the teachers and learners. The findings might also help in guiding the teachers and even the learner's attitude towards use of ICT in teaching and learning.

LITERATURE REVIEW

Theoretical review

Two theories were found to be relevant in establishing the influence of information technology on child education. The theories that were found to best inform the research constructs are the diffusion of innovation theory (Rogers 1962) and Social Learning Theory (Bandura 1977).

Diffusion of innovation theory

The study was anchored on the theory of diffusion of Innovation by Rogers (1962). Diffusion of innovation according to Rogers is the process where an innovation is communicated by use of certain channels over a given period of time. Diffusion of innovation is a special form of communication as the messages are concerned with new ideas Rogers, (1995). The theory presents five features of innovation that affect its diffusion and these include relative advantage, compatibility, complexity, trial ability and observability Rogers, (2003). The theory further divides technology adopters into five categories depending on their speed of uptake: innovators, early adopters, early majority, late majority, and laggards. Rogers, (1995) proposed that the appropriation of advancements is affected by the five qualities, and that they can clarify the rate of innovation selection. This theory explains how ICT can be adopted in learning institutions to teach learners. While there are schools that adopted ICT early, the researcher applied the theory in evaluating influence of information technology on child education. The theory was also applied in explaining how the success of such schools can be emulated to benefit learners through adoption of ICT.

Social Learning Theory

This theory was proposed by Albert Bandura (1977). According to Bandura (1977) learning would be exceedingly laborious, if not hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. However, most human behaviour is learned observationally through modelling. From observing others, one forms an idea of how new behaviours are performed, and on later occasions this coded information serves as a guide for action. Bandura (1977) believed that direct reinforcement could not account for all types of learning and that people can learn new information and behaviours by watching other people, known as observational learning (or modelling). In his famous "Bobo doll experiment", Bandura " demonstrated that children and imitate behaviours they have observed in other people. The children in Bandura's studies observed an adult acting violently toward a Bobo doll. When the children were later allowed to play in a room with the Bobo doll, they began to imitate the aggressive actions they had previously observed. Bandura identified three basic models of observational learning as a live model, which involves an actual individual demonstrating oracting out behaviour, a verbal instructional model, which involves descriptions and explanations of behaviour and lastly a symbolic model, which involves real or fictional characters displaying behaviours in books, films, television programs, or online media. From Banduras theory on social learning, ECD teachers learn and often teach the children like their tutors taught them. If teacher trainees observe their trainers using lCTs in their instruction, the teacher trainees too will aspire and at times unconsciously teach like their trainers, not like the teachers teach them to teach. The teacher trainers should be empowered and encouraged to make use of information and communication technologies in their instruction in order to act as role models to their students and the student teachers will copy them

Empirical Review

Joshua (2013), did a study on to investigate factors that influence integration of ICT in primary school science education in Molo district. The study adopted a descriptive survey approach as the research design. The opinions of all the 85 science teachers in the 44 public schools were collected through a survey questionnaire and an observation checklist. The target population was all science teachers of primary schools in Molo district. All science teachers in public primary schools were selected to participate in the study. The data collection instruments were piloted in the neighboring Kuresoi district, in order to determine their validity and reliability. Data were coded and analyzed using both qualitative and quantitative techniques and were presented in form of tables, graphs and pie charts. The findings revealed that that availability of in-service education and training opportunities for teachers, the attitudes of the teachers, the level of ICT competency among teachers and the availability of ICT resources affected integration of ICT in primary schools science education. It was also established that there was a general lack ICT resources in the schools, and those found were located in the administrative office thus not being accessible for integration of ICT.

Titus (2015), did a study to investigate factors influencing pedagogical integration of ICT in teaching and learning in public secondary schools in Keiyo Sub County, Elgeiyo Marakwet County. The research objectives were: To determine how the ICT infrastructure available influences pedagogical integration of ICT in teaching and learning in public secondary schools in

Keiyo Sub County ; To establish how access of ICT influences pedagogical integration of ICT in teaching and learning in public secondary schools in Keiyo Sub County ; To determine how leaners level of training on ICT influences pedagogical integration of ICT in teaching and learning in public secondary schools in Keiyo Sub County . To assess how the teachers‟ training in ICT influences pedagogical integration of ICT in teaching and learning in public secondary schools in Keiyo Sub County. The study applied a descriptive survey research design and data was collected using questionnaires. The study targeted public secondary schools that have installed ICT in teaching and learning. In this study, Stratified random sampling and simple random sampling was used in selection of the study sample. The findings of this study indicate that use of ICTs was largely limited to acquisition of basic skills by teachers and learners and availability of infrastructure. More efforts should focus on preparing the teachers and learners to use ICT as instructional tools. Thus, the use of ICTs in schools should focus more on the way ICTs can be used to enhance teaching and learning rather than basic computer skills. The study concludes that the potential that ICTs hold in pedagogy can only be attained if key challenges identified as influencing the use of ICTs in supporting teaching and learning are handled. These factors include availability of ICT infrastructure, lack of skills on how to integrate ICTs in teaching and learning, poor connectivity, poor electricity supply and lack of technical assistance. Based on the findings the researcher proposes further research on attitude and perception towards integration of ICT in teaching and learning and the extent of adoption of ICT in selected urban and rural schools.

Israel (2016) did a study on the positive and negative impact of ICT on education in Nigeria. This study adopted a case study research design. The study used primary data. The data was collected through an interview guide. The data collected was analyzed using content analysis .The study found out that during the last decades, considerable resources have been invested in hardware, software, connections, training and support actions under the scope of improving the quality of teaching and learning. A major tenet of the policies that supported the introduction of information and communication technologies (ICT) in education was that they can become catalysts for change. Undoubtedly, some countries have made considerable progress in bringing networked ICT into education and made it possible for teachers and learners to use them on a daily basis. In many other cases, however, implementation policies have not been a consequence of systematic analysis and reflection.

Martin (2016), did a study to establish the factors influencing the implementation of Information and communication technology projects in public secondary Schools in Kwale County. The objectives of the study were to establish how infrastructural facilities influence the implementation of ICT projects in public secondary schools in Kwale County, Kenya, to examine the role of stakeholders in ICT projects implementation in public secondary schools in Kwale County, Kenya, to determine how financial resource influence the implementation of ICT projects implementation in public secondary schools in Kwale County, Kenya, to establish the school administrative practices that supports the implementation of ICT projects implementation in public secondary schools in Kwale County, Kenya. Non-experimental descriptive survey design was used to establish the factors that influence the implementation of ICT projects in secondary schools Kwale County. There are 60 secondary schools that made up the target population. A sample of twenty schools which equated to 48% of the total population was used in the study. Stratified random was

used to allow full participation of the schools. There are 650 teachers in secondary schools that made up the target population. Four teachers were randomly sampled in each sample school to fill the questionnaire, also six students. Eight principals were interviewed to represent each category of schools. Questionnaires, observation schedule and interview enabled the researcher collect data. Piloting was done in two schools to test the reliability and validity of the research instruments. The data collected was analyzed using statistical package for social sciences (SPSS). Descriptive statistics was used to present the results of the study and the general trends; this involved tabulating and describing data. The study found out that technological revolution in schools has been beset by theoretical inadequacies that have kept educational technology at the margins of the established educational system.

Gaitho (2016), did a study to investigate the factors influencing use of ICT in teaching and learning among primary school pupils in Kandara Sub-County in Kenya. The main objective of the study was to identify the factors contributing to pupils ICT use in the country .It also looks at how ICT infrastructure influences their teaching and learning process, the skills that the teachers and the pupils need and how they influence them to use ICT in teaching and learning process. It also looks in to how they access these ICT tools and if the ICT equipments are available for them during their teaching and learning process. Survey methods have been used to collect data where the questionnaire has been the main data collection instrument. Stratified random sampling methods were used .The study focused on the 226 pupils and 14 teachers in primary schools in Kandara SubCounty. The findings revealed that 94.9% of pupils respondents and 92.9% of teachers had no access to power.97.3% of pupil respondents and 92.8% of teacher respondents confirmed that they had no computers at schools.93.3% of pupil respondents and 92.9% of teacher respondents indicated that computers are placed in offices and this had negatively affected the use of ICT in teaching and learning in primary school. 92.9% of teacher respondents and 89.8% of pupil respondent were not connected to internet in their schools. 100% of pupil respondents and 64.2% of teacher respondents reported that they had never received any training on how to use ICT devices.100% of teacher respondents and 99.5% of pupil respondents had no technical support personnel in their schools and this was one of the barriers that resulted in computers being under-utilized in classes. Teachers Service Commission is obliged to provide ICT personnel to support the teachers and pupils effectively in primary schools. 97.8% of pupils and 71.4% of teachers had never interacted with computers and therefore the respondents had no access to computers and this contributed to their inability to use ICT in teaching and learning. The government and education stakeholders should combine effort to equip schools with computing resources.

Research gaps

Geographical gap is a knowledge gap that considers, the untapped potential or missing/limited research literature, in the geographical area that has not yet been explored or is under-explored. For instance Gaitho (2016), did a study to investigate the factors influencing use of ICT in teaching and learning among primary school pupils in Kandara Sub-County in Kenya. The study found out that 94.9% of pupils respondents and 92.9% of teachers had no access to power.97.3% of pupil respondents and 92.8% of teacher respondents confirmed that they had no computers at schools.93.3% of pupil respondents and 92.9% of teacher respondents indicated that computers are placed in offices and this had negatively affected the use of ICT in teaching and

learning in primary school .The study presented a geographical gap as it was done in Kandara sub county while our current study will focus to influence of information communication technology on child education

Methodological gap is the gap that is presented as a result in limitations in the methods and techniques used in the research (explains the situation as it is, avoids bias, positivism, etc.). Martin (2016), did a study to establish the factors influencing the implementation of Information and Communication Technology projects in public secondary Schools in Kwale County. Non-experimental descriptive survey design was used to establish the factors that influence the implementation of ICT projects in secondary schools Kwale County. The study found out that technological revolution in schools has been beset by theoretical inadequacies that have kept educational technology at the margins of the established educational system.The study presented a methodological gap as it involved correlation design while our study will adopt a desktop literature review method (desk study). Which involves an in-depth review of studies related to influence of information communication technology on child education

METHODOLOGY

The study adopted a desktop literature review method (desk study). This involved an in-depth review of studies related to influence of information technology on child education. Three sorting stages were implemented on the subject under study in order to determine the viability of the subject for research. This is the first stage that comprised the initial identification of all articles that were based on influence of information technology on child education from various data bases. The search was done generally by searching the articles in the article title, abstract, keywords. A second search involved fully available publications on the subject on influence of information technology on child education. The third step involved the selection of fully accessible publications. Reduction of the literature to only fully accessible publications yielded specificity and allowed the researcher to focus on the articles that related to influence of information technology on child education which was split into top key words. After an in-depth search into the top key words (influence, information technology, child education), the researcher arrived at 5 articles that were suitable for analysis. The 4 articles were findings from Joshua (2013), who did a study on to investigate factors that influence integration of ICT in primary school science education in Molo district.The study found out that showed that there was a positive moderate relationship between the transformational leadership style and discipline .Kariuki (2013) who conducted a study to analyze the leadership styles of principals and their influence on leaners' performance of secondary schools in Kinangop district. the attitudes of the teachers, the level of ICT competency among teachers and the availability of ICT resources affected integration of ICT in primary school science education

Titus (2015), who did a study to investigate factors influencing pedagogical integration of ICT in teaching and learning in public secondary schools in Keiyo Sub County, Elgeiyo Marakwet County.The study found out that concludes that the potential that ICTs hold in pedagogy can only be attained if key challenges identified as influencing the use of ICTs in supporting teaching and learning are handled. These factors include availability of ICT infrastructure, lack of skills on how to integrate ICTs in teaching and learning, poor connectivity, poor electricity supply and lack of technical assistance.

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SUMMARY, CONCLUSION AND POLICY IMPLICATION FOR FURTHER STUDY

Summary

ICT projects and their relevance in education are spreading rapidly in schools not just in wealthy countries, but increasingly in developing ones as well. However, although schools have had computers for almost two decades and some with ICT projects underway, ways to use and implement them effectively have evolved slowly and patchily. Technological revolution in schools has been beset by theoretical inadequacies that have kept educational technology at the margins of the established educational system. Research findings across the country have revealed that there are ICT facilities in schools such as computers, computer laboratories, internet connections, alongside the traditional methods of telecommunication. Further research has revealed that projects involving ICT use and integration in the schools have both internal and external challenging factors leading to weak implementation of these ICT projects.

Conclusion

The apparent immense educational potential of ICTs has captivated stakeholders in education around the world. There is widespread belief that ICT can and will empower teachers and learners and transform teaching and learning processes from being highly teacher-dominated to student-centered. This transformation will result in increased learning gains for students, creating and allowing for opportunities for learners to develop their creativity, problem solving abilities, informational reasoning skills, communication skills and higher-order thinking skills. The research findings in this study reveal that ICTs has the potential of improving the quality of teaching and learning in secondary schools if fully exploited.

The influence of ICTs in learning cannot be dealt with in isolation. For technology to be effective, it must be availed to learners at the right time and place. There is need to be effective, it must be availed to learners" proximity; that is in classrooms or supposed learning environment

Recommendations

School management should focus on increasing their ICTs infrastructure by provision of computers, building computer laboratories and encouraging public-private partnership so as to help in internet connectivity and provision of basic infrastructure. Capacity building is an important initiative that helps in ensuring that the benefits that accrue from use of technology in education are maximized. Additionally, students should be provided with technical assistance to use ICTs in teaching and learning. They should be guided on all ICTs applications with necessary expertise to enable them acquire ICT skills for use in pedagogy. This can be done by ensuring that students are made to realize the new innovations in educational technology and be prepared and equipped with skills for the technology era

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