EFFECTS OF DIGITAL MEDIA ON TEACHING AND LEARNING OF PRE-SCHOOL CHILDREN'S READING SKILLS: A CASE OF MAVOKO SUB-COUNTY, MACHAKOS COUNTY, KENYA

[1]Helen Musyoka, [2]Dr. Esther Marima, [3]Dr. Suleiman Mwangi

[1,2,3] St. Paul's University, P.O Box Private Bag, Limuru – 00217, Kenya

Abstract: **This study aimed at assessing the utilization of digital media in teaching and learning of reading skills in Mavoko sub-county, Machakos County, Kenya. Specific objectives included to: identify types of digital media being used in teaching and learning of reading skills in ECDE Centers in Mavoko Sub-county, Machakos County, establish the level of utilization of digital media as a medium of teaching and learning of reading skills in ECDE centers within Mavoko Sub-county, Machakos County and find out the views of teachers on the effectiveness of utilization of digital media in teaching and Learning of reading skills. The study adopted descriptive research design. It relied on two sampling techniques namely: stratified random sampling and purposive sampling techniques. The study targeted head teachers, teachers, and children from both public and private ECDE centers. Face to face interviews and questionnaires were used as tools for data collection. The data was presented in form of frequencies, percentages and in form of tables and charts. The study revealed that several digital media were provided for use in teaching by the ECDE teachers, although most of instructional media were inadequate. The findings disclosed that the common digital media were computers/electronic learning aids. The study analysis also revealed that the level of utilization was generally low but comparatively high in private as opposed to the public ECDE centers. Most of the private ECDE teachers rated effectiveness of the use of digital media in teaching and learning as very. The study concludes that a variety of digital media were available in the private and public ECDE centers for teaching. It also concludes that the level of utilization of these instructional media is complex and revolved around many issues. The study recommends that all the key stakeholders concerned be involved in looking for ways of encouraging and enforcing the utilization of instructional media in the ECDE centers. The government also needs to put more efforts on setting up the ICT infrastructure in public schools so that the benefits enjoyed by private schools children can also be felt by public schools children.**

1. BACKGROUND

Technology has become part and parcel of our everyday lives and it difficult to imagine living in a world without it (Hobbs & Moore, 2013). Digital media, perhaps triggered by, among other things, global economic development, is one of the technologies which are affecting everyday life of the society as a whole and of the individual (Linebarger, 2015). According to the UN (2017), the role of digital media has been completely associated with the delivery of the new Sustainable Development Goals (SDGs) which came into effect in 2016. "Education for All" (EFA) goals can be achieved by the help of ICT use, according to EFA Global monitoring Report (2012). It was recommended that at an affordable cost ICT should be embraced to sustain EFA goals. It was further noted by the report that effective learning, knowledge and development of more efficient school services are achievable by these technologies. At the same time, the spread of digital media continue to raise many concerns especially in terms of amplifying pre-existing risks.

The use of digital media is impacting the way children learn and study. According to Marcinek (2015), technology in education has become so important that it can no longer be conceived as a separate class in a lab. Technology today is "a literacy that must be threaded throughout the fabric of a school" (p. 3). This is supported by Alharbi (2014) who acknowledges that indeed, over the past few years, information and communications technology (ICT) has become more and more important to learning institutions including schools and universities. A 2016 Digital Study Trends Survey in the US found that 46% of students said it was important to be able to study on a mobile device, while 22% said studying on a mobile device was extremely important. In addition, 60% of students surveyed said they have used their smart phones for studying. With digital media coming into focus for learners, educators are integrating educational media into their classrooms. According to this survey, despite the undeniable presence and influence of digital media in learner's lives, many teachers are integrating social media into the classroom. This survey also found out that, among 1,002 U.S. K-2 teachers, only 13% of those asked had integrated digital media as teaching and learning and teaching resource, with 18% saying they have not embraced digital media platforms. The survey also found that teachers were more reluctant to incorporate digital media into their classroom teaching and learning than in 2013.

In Kenya, according to Uwezo, (2016) reading skills in pre-school children have remained static over the years. The report points out that, only 3 out of 10 children in class 3 can do class 2 works. On average 1 out of 10 children in Kenyan Primary schools is completing class 8 without having acquired the basic competencies expected of a child completing class 2.The Kenyan government launched a Digital Learning Program whose aim is align integration of Digital Media into teaching and learning for standard-one pupils in primary schools. The components of this project include: improvement of ICT infrastructure, development of digital content, capacity building of the teachers and procurement of digital media devices. This may improve the reading skills of children at an early age.

Many children today are born to the world full of technology and they soon grow into skillful and eager users of technology (Aktaş & Yurt, 2017). Young children are therefore mostly affected by the use of the digital media. According to a report by UNICEF (2013), virtually every aspect of children's lives has become part of, even reliant on digital media either directly or indirectly (UNICEF, 2013). This is partly attributed to the fact that young children are by nature explorers who investigate everything in their environment and beyond (Hobbs & Moore, 2013). Therefore, in the context of modern world, teachers, educators and guardians must re-consider or redefine what it means to be literate in the globe today. It implies that schools need to provide a new curriculum to assist children learn and develop new skills that include but not limited to communication skills, critical thinking, reading and media literacy (Aktaş & Yurt, 2017). Encouraging or enhancing all these skills is possible under conditions when multimedia technologies are regularly used in the classes.

The exposure to digital media is therefore not contested. Spreading from high-through to middle-and low-income countries, many children, especially those from high- and middle-income households, are frequently being exposed to digital media such as the use of mobile phones, laptops, tablets, or games consoles(Livingstone, Mascheroni & Staksrud, 2015). The extent of children's exposure to digital media, sometimes even higher levels than what has been recommended by child development professionals, in high income countries has remained uncontested (Third & Collin, 2016). In Africa, digital platform especially in the form of mobile phone technology now accounts for four out of every five connections worldwide (Pathak-Shelat & DeShano, 2014). In one of the latest report by the Global System for Mobile communications (GSMA) about m-learning, more than half of all young people surveyed in Ghana, India, Uganda and Morocco who had accessed the internet, had done so through a mobile based platform or device (Kucirkova & Littleton, 2016).

As young people become increasingly exposed at a younger age to digital media, it can be more interesting to find out if this has any impact on teaching and learning than the traditional classroom. Many anecdotes, folk tales can attest that "young children tend to be more willing and open to experimenting with new ideas" (Pathak-Shelat, & DeShano, 2014, p.985). In this process, they pick up new media much more quickly compared to how the average adults process the world around them. Consequently, many believe that the digital media can be used as an effective literacy teaching tool for young children. According to Mares and Pan (2013) digital technologies have significant implications to educators since they have brought fundamental changes on how ideas are represented.

Beschorner and Hutchison (2013) also explain that digital media offers unique audio capabilities such as audible narration that is not available when using bound paper books alone, hence the potential to more fully engage children when the narrated words are timed with highlighting of the related text. However, there is little research to support the availability and utilization of digital media in Mavoko Sub County, in increasing reading skills in early childhood development centers because most of the studies done so far focus on secondary schools and colleges. This is confirmed by Normann

(2012) who researched on digital storytelling in second language learning with a focus on university students in Norwegian University of Science and Technology. Pathak-Shelat and DeShano (2014) studied digital media but concentrated on youth cultures in small town and rural Gujarat in India. Besides, opinion is still divided on impacts of digital media on children.

Proponents of digital media argue that it offers enormous potential to improve learning and children's cognitive development (Linebarger, 2015; Mares & Pan, 2013), while others, such as Greenlaw (2015), has drawn on a more techno-critical opinion to critique the transformative function of ICT in the education system. Selwyn (2016) argues that whereas there is much anxiety about the interruption of education by technology, there still is a need to problematize and analytically examine this in a more defined and nuanced manner. Therefore, in order to understand and take advantage of the potential opportunities that could be presented by the digital media, robust evidence based study from which to support its utilization is required. It is against this background that the study examines utilization of digital media in teaching and learning of reading skills in Mavoko sub-county, Machakos County, Kenya.

2. STATEMENT OF PROBLEM

Education is at the heart of Kenya's Vision 2030. Since Early Childhood Education lays the foundation for literacy and future learning, literacy development during the early years (age three to eight) is even more crucial. Consequently, the national and county government have established several ECDE centers across the counties in Kenya. In addition, there are various programs such as Tayari which seeks improvement in young children's readiness to learn as well as working with pre-school children to enhance literacy skills (Kathomi, 2015).

Despite all these efforts, poor performance in early literacy and kindergarten achievement is still occurring. According to a study by Uwezo, (2016), about 28% of children in Kenya leave primary school unable to read and write fluently. Uganda and Tanzania had 4% and 8% of children unable to pass a Standard 2 level reading test respectively. Mavoko sub-county is one of the sub-counties in Kenya with literacy levels estimated at 21%. This raises questions about the type of early childhood education programs and whether or not they are effective. Digital media is useful in ECDE teaching and learning process because of its ability to motivate children and influence their active participation in class (Mares & Pan, 2013).

Therefore, there is need to deepen our understanding on utilization of digital media in teaching and learning of reading skills. In addition, it is necessary to go a step further in suggesting the ideal type of digital media for children. So far, there is no adequate research on the use of digital media within the Kenyan context, especially Mavoko Sub-county. Moreover, not much research has been conducted to investigate its availability and utilization in ECDE teaching and learning of reading skills of children aged 5 to 8 years old in Kenya and in particular Mavoko Sub County. Kaindio and Wagithunu (2014) is one of the closest studies on the use of digital media though it focused on primary school children. Therefore, this study sought to examine availability and utilization of digital media in teaching and learning of reading skills in Mavoko sub-county, Machakos County, Kenya.

3. OBJECTIVE OF THE STUDY

The broad objective of this study was to investigate utilization of digital media in teaching and learning of reading skills of Early Childhood Children in Mavoko Sub-County, Machakos County in order to give up-to-date information that may be useful to educational planners, administration, donors, parents and pupils as well as other stakeholders. Specific objectives included:(i) to identify types of digital media being used in teaching and learning of reading skills in ECDE Centers in Mavoko Sub-county, Machakos County, ii) to establish the level of utilization of digital media as a medium of teaching and learning of reading skills in ECDE centers within Mavoko Sub-county, Machakos County, iii) to find out teachers' views on the effectiveness of utilization of digital media in teaching and Learning of reading skills.

4. LITERATURE REVIEW

Types of Digital Media Being used in the Education Sector

Digital media takes many forms in the education sector. In particular, digital learning resources include content and, sometimes learning based activities. They combine multimedia components such as images, text, audio and video to present information. Examples of digital media include television, DVDs, tablets, computer games, Electronic books (e-books) and computers and electronic learning aids (ELAs). A typical example of digital media is digital stories. Currently there is no single and universal digital media tools such as graphics, audio, video, and animation to tell a story.

Sung, Chang and Liu (2016) in their study about the impacts of utilizing mobile devices with teaching and learning on pupils' learning performance, acknowledge that digital media such as laptops, mobile phones, and personal digital assistants have become common learning tools associated with huge potential in both classrooms and outdoor based learning. The authors observed that tablet was the most common digital platform being used for teaching and learning but with a moderate mean effect size of 0.523 for their utilization in the education sector. The results of this study and their implications for both research and practice are relevant to the current study. The only shortcoming is that it is not based on empirical evidence.

According to an empirical study by Boadu, Awuah, Ababio & Eduaquah (2014) which examines the state of use of digital media in selected Schools within the Cape Coast metropolis in Ghana. The authors established that both students and teachers were positive about the use of technology. However, the exhibited a number of challenges that included inadequate resources, lack of enough time and lack of motivation by teachers in their attempt to use the available technology. Although the study provides good insight, it focuses on high post primary school context. The current study focused on ECDE children and is based on their reading skills.

The use of Digital Media and Children's Participation in Reading Exercises

Hung et al. (2012) explain that technology has positive effects on student motivation. The authors explain that students are able to respond positively to technology and are motivated by technology hence the need for teachers to make conscious efforts towards creating activities incorporated with some form of technological tool. These sentiments are shared by Normann (2012) who explains that digital media especially digital storytelling encourages students' engagement as they work on their story after receiving basic instructions from their teacher.

In a study conducted by, Smeda, Dakich and Sharda (2014) established that digital media, particularly, digital storytelling was a powerful tool for teaching young children because of its ability to create more engaging and exciting environments for teaching and learning thus enhancing student engagement and better academic outcomes. The study was based on a multi-site case approach within a single Australian school both at secondary and primary levels. The selected students and teachers were given opportunity to engage in innovative teaching and learning experiences using digital storytelling. The point of departure in the current study was that it focused on young children from ECDE centers.

Level of Utilization of Digital Media as a Medium of Teaching Young Children

The use of digital media tends to revolve around their functions (Granito & Chernobilsky, 2012; Kok & Muula, 2013). Although it is believed that information technology including digital media could add a powerful punch to the modern educational environment, many educators insist on the proper or effective use of the available instructional technology as opposed to presence of that technology advances learning. Amuko, Miheso and Ndeuthi (2015) in their study about opportunities and challenges in the integration of ICT in teaching and learning Mathematics in secondary schools in Nairobi, Kenya. The findings from the study indicated that teachers encounter huge challenges which include coming up with their own technological skills and knowledge in addition to training themselves in the use ICTs in their teaching. This lack of support in capacity building was determined by the study to play a part to the teachers' laxity in assimilating technology in their teaching in spite of the eagerness.

According to a study by, Elom and Okolie (2014) aimed at finding out the challenges of effective teaching and learning using digital media in Nigerian Public Secondary Schools face, inadequacy of instructional materials, workshop tools and equipment required for effective teaching and learning of basic technology as well as poor funding of basic technology were the common challenges that teachers faced in Nigerian public schools. The study was based on survey design and was carried out with 12 secondary schools in Ebonyi State Nigeria. It targeted mainly 5 basic technology teachers and 2 school administrators from each of the twelve schools that were selected for the study.

Agyei and Voogt (2012) in their paper about developing Technological Pedagogical Content Knowledge in Pre-Service Mathematics Teachers through Collaborative Design presents a case study of four pre-service mathematics teachers from the University of Cape Coast, Ghana, who worked in two design teams to develop lessons, and afterward taught in a technology-based environment for the first time. It was manifest from the findings that more systematic endeavors are required to engage pre-service teachers in technology-rich design activities, to develop their TPCK adequately. The study also showed the potential of TPCK as a new frame for developing pre-service teachers' experiences in technology integration within initial teacher education, particularly in Sub-Saharan African countries.

Teacher's views on the Effectiveness of Utilization of digital media in Learning

Digital media has become integral in the teaching and learning process today. A recent survey conducted by Vidushi Daga (2017) found out that, classroom teaching has become more interactive with use of digital media such as video presentations, e-learning methods, online training and other digital programs. Joyce Waddell, (2015) states that, although digital media is finally being integrated into education, its use for teaching still remains a challenge. Despite the fact that many schools today are privileged to have access to digital media, trained teachers, and a favourable policy environment, the use of digital media is still low. Some attribute low levels of digital media use to the pedagogical beliefs of teachers.

Challenges faced by teachers in use of digital media in teaching and learning

According to a research carried out by Miima, Ondigi and Mavisi (2013) established that both extrinsic and intrinsic factors acted as stumbling blocks to the use of digital media and other ICT in teaching. The findings of the research disclosed that most teachers generally did not have enough time thus most of them were reluctant to employ the use of technology in their teaching based activities. In the study, about 89% of teachers reported that they did not have confidence, 100% lacked skills, while 78% of the teachers were resistant to change.

Nuuyoma (2012) also assessed the obstacle facing English language teachers in integrating digital media in their teaching of reading and writing exercise. The author observed that there were several obstacles but which mainly included lack of appropriate training and competence, lack of resources and overcrowding in the class setups. Similarly, Adebi-Caesar (2012) reported three major challenges hindering the use of digital media by teachers in Ghana and these included inadequate time, lack of training in the usage of ICT and other technologies and lack of previous experience in the use of existing technology.

Omariba (2012) in her study about the challenges facing teachers and students in the use of instructional technologies revealed that utilization of digital media was inadequate. Other challenges faced by teachers included limited skill on use of some instructional technologies, funds and lack of support from the administration. The author recommended for the need to come-up with strategies to curb this menace.

Theoretical Framework

This study was guided by two theories: Media richness theory and Emergent Literacy Theory

Media richness theory

Media richness theory (MRT) is simply a framework used to describe a communication medium's ability to reproduce the information sent through it. This theory was introduced by Richard Daft and Robert Lengel in the 1980s (Daft & Lengel, 1984). MRT can be viewed as subset of contingency theory because it makes propositions about how the fit between information processing requirement (like equivocality) and adoption of a particular media by an organization that affect performance. In simple words, the theory describes how and why particular media are preferred to pass a given message. In the context of this theory, richness is operationalized in terms of the medium's capability to achieve four main objectives including sending multiple cues, supporting variety or different languages, sending immediate feedbacks, and facilitating personal communication (Shepherd & Martz, 2006). The theory holds the assumption that individuals' performance improves with the use of "richer" media for equivocal tasks. It also assumes that there is a link between equivocality and media choices calling for an appropriate media platform to reduce uncertainty and equivocality that commonly characterize difference tasks.

This theory is relevant in this study because it considers the capability of given instructional media to provide a rich communication experience. The use of an instructional technology, which is digital media, is an important variable in this study especially in terms of the types being used and the extent at which it is being utilized. The theory assumes that individuals' performance improves with the use of "richer" media for equivocal tasks. This also applies to learners' reading skills which may improve depending on the extent of the use of digital media and the type of digital media as well as the balance of challenges that may affect the use of the digital media. The fact that Digital media allows delivery of multiple cues, support variety or different languages, send immediate feedbacks, and facilitating personal communication even makes the theory more relevant to the proposed study because this can be used to understand whether or not children using digital devices improve their reading skills.

Emergent Literacy Theory

Emergent Literacy Theory is defined as the developmental steps a young child takes prior to actually reading a text, and pretending at reading and writing before actually doing so. The theory was proposed by Marie Clay and holds that there are levels of literacy behaviours which children acquire before they formerly get into classroom which facilitate the acquisition of reading and writing skills at a conventional level.

This theory holds that children's listening speaking, reading and writing begins at birth, it also emphasizes the importance of a literacy rich school environment. Components of a rich school environment include: having a variety of digital media tools like computers which are programmed to provide quality literacy information to the children and teachers frequently providing guidance to the learners on reading skills using these computer programs. According to Marie Clay (1975) children know a great deal about reading before they come to school, and they are able to experiment with and apply their knowledge in various ways. A learner who has achieved emergent literacy has oral language skills, phonological awareness, print awareness and letter awareness.

This theory was relevant to this study since it advocates for the use of digital media in learning. It provides a clear instructional guidance to early childhood teachers who then plan their lessons based on the requirements of this theory. It also provides a basis for the importance of using digital media in a classroom and how the digital media can help learners in acquiring reading skills.

5. METHODOLOGY AND DATA

The study was carried out in Mavoko sub-county located at the Northwestern most end of Machakos County. The sub-county is bordered by Nairobi City to the North, Nairobi National Park to the North-West and Kajiado County to the West. It lies at an area of 843.2km^{2}extending to the borders of Nairobi City, Kajiado County, and almost engulfing the National Park. Administratively, it is divided into 4 divisions, 7 locations and 14 sub-locations

The study targeted all ECDE centers within Mavoko, both private and public, whether using digital media or not. The study targeted ECDE children and teachers within Mavoko Sub-county. The population was targeted because they are users of digital media and therefore knowledgeable-about utilization and availability of digital media for teaching children in Mavoko. There are a total of 270 ECDE centers in Mavoko Sub County. Out of this, 220 are private and 50 are public. Total number of teachers in private ECDE is 440, and those in public are 100. The total number of children in Mavoko Sub- County is 13500 whereby 4500 are from private ECDE Centers and 9000 are from public ECDE Centers

The ECDE centers were sampled using stratified sampling technique and in this case, the sample was stratified into either private or public. Therefore, 10 teachers from public and 44 from private ECDE Centers were selected using simple random sampling making a total of 54 teachers

Data was collected using questionnaires and analyzed using qualitative and quantitative methodologies. All data collected during the field study were edited, validated and then coded and checked for completeness. Editing of the instruments was done to scrutinize and check for errors and omissions. Data analysis was conducted using both quantitative and qualitative techniques. Statistical Package for Social Sciences (SPSS) software was used to calculate frequencies and percentages. Data was presented by use of tables, pie-charts and histograms. Qualitative data was transcribed, analyzed thematically and presented using verbatim quotations and narrations.

6. FINDINGS AND DISCUSSIONS

Demographic Information

ECDE Teachers' Gender

The researcher sought to find out the gender of the respondents (ECDE teachers and children) and how this would affect their responses. Table 4.1 shows that 68.5% (37) of the ECDE teachers were females. Out of which 11.1% (6) came from public schools while 57.4% (31) from private schools. The findings further show that male ECDE teachers comprised of only 31.5% (17) with 7.4% (4) from public schools and 24.1% (13) from private schools. Table 4.1 summarizes the findings.

Table 4.1: Gender Composition of the ECDE Teachers

Gender	School Type		Total
	Public	Private	
Male	4 (40%)	13 (29.5%)	17 (31.5%)
Female	6 (60%)	31(70.5%)	37 (68.5%)
Total	10 (100%)	44(100%)	54 (100.0%)
Private N = 44 **Public N = 10**			

Source: Author, 2018

The current findings therefore imply that most ECDE centres were managed by female teachers. From the data, there is gender imbalance among ECDE teachers who are key players in implementation of ECDE curriculum. The fact that most of the teachers were female is a characteristic of many ECDE and pre-schools in Kenya. It could also be attributed to the fact that ECDE is considered a domain for women and cultural beliefs that child is a responsibility of women. In a study by Githinji (2011) on the influence of background factors on pre-school teachers' and managers' perception of impact of childhood play activities on child development in Kiambu district Kenya found that majority (88%) of the pre-school teachers were females while (12%) were males.

Pre -School Children Age

Using the interview schedule, the researcher also sought to establish the respondents in the 3-6 age brackets which generally define children who are in the ECDE centres. In addition, since this study was based on a topic based on ECDE children and their learning, it was established that the respondents would be drawn from ECDE in each participating school. The age bracket was therefore expanded to include younger children. The age distribution is indicated in Figure 4.1.
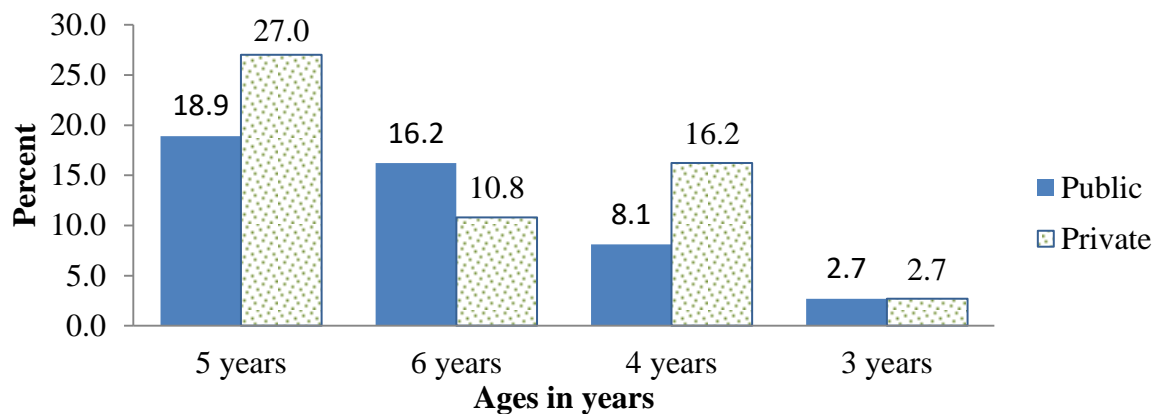
Source: Author, 2018

Figure 4.1: Distribution of ECDE children according to their age groups

The figure below indicates the distribution of ages in the selected ECDE Centers in Mavoko Sub-County between ages 3 to 6 years. Trend observed in Figure 4.2 below indicate that, in relation to age of the ECDE children, 18.9%(170)and 27.0%(122) of children aged 5 years of age were from public and private ECDE centres respectively making a total of 45.9% (292). A total of 27% (195) of children were aged 6 years, and this included 16.2% (146) from public and 10.8% (49) from private ECDE centres. Another 24.3% (148) of the children were 4 years with 8.1% (73) from public and 16.2% (75) from private ECDE centres. However, only 5.4 % (36) were aged 3 years with an equal proportion of 2.7% from both private (12) and public (24) ECDE centres. Children in Kenya start formal schooling after their 3rd birthday and before their 4th birthday. At age 3, the children are in playgroup and not so interactive and may know little on Digital media. This is why the current study focused mostly on the children who are in pre- primary 2 (age 5-6) because at this age the children are intuitive and are able to interact with digital media and also because they were likely to answer the questions adequately.

ECDE Teachers Experience in the School

Teachers at the ECDE centers were asked to state the length of time in years they had been teaching at their respective schools as presented in Table 4.2.

Table 4.2: ECDE Teachers Experience in the school

| Response	School Type		Total
	Public	Private	
2 years	2 (3.7%)	3(5.6%)	5(9.3%)
3 years	1(1.9%)	12(22.2%)	13(24.1%)
4 years	5(9.3%)	8(14.8%)	13(24.1%)
5 years	2(3.7%)	21(38.9%)	23(42.6%)
Total	10(18.5%)	44(81.5%)	54(100.0%)
N= Private 44 **N= Public 10**			

Source Author, (2018)

The findings revealed that about 9.3% of the respondents had been teaching at the school for 2 years with 3.7% from pubic and 5.6% from private ECDE centers. About 24.1% had taught for 3 years comprising of 1.9% from public and 22.2% from private. Another 24.1% had been teaching for 4 years and this included 9.3% from public and 14.8% from the private ECDE centers. Lastly, 42.6% had taught at their respective schools for 5 years with most of them from private (38.9%) compared to only 3.7% from public schools. The findings therefore imply that majority of teachers had taught at the school for 5 years. This category of respondents is an indicative of experience. The fact that most of the ECDE teachers had stayed or taught for at least five years could be attributed to their teaching experience. Therefore, from the findings, Mavoko Sub County had a high percentage of teachers with at least five years teaching experience in their respective schools.

Similar results were reported by Elom and Okolie (2014) in their study that aimed at finding out the challenges of effective teaching and learning using digital media in Nigerian Public Secondary Schools face. The authors confirmed that teaching experience was important in terms of information required for research touching on issues of teaching.

The Types of Digital Media Being used in Teaching and Learning of Reading Skills in the ECDE Centers within the Study Area

In addressing the first objective of this study which aimed at identifying the types of Digital Media being used in teaching and learning of reading skills in ECDE Centers in Mavoko sub-county, Machakos County, the sampled teachers were asked to indicate the common types of digital media they were using to teach the prescribed ECDE centers. The findings are as presented in Figure 4.2
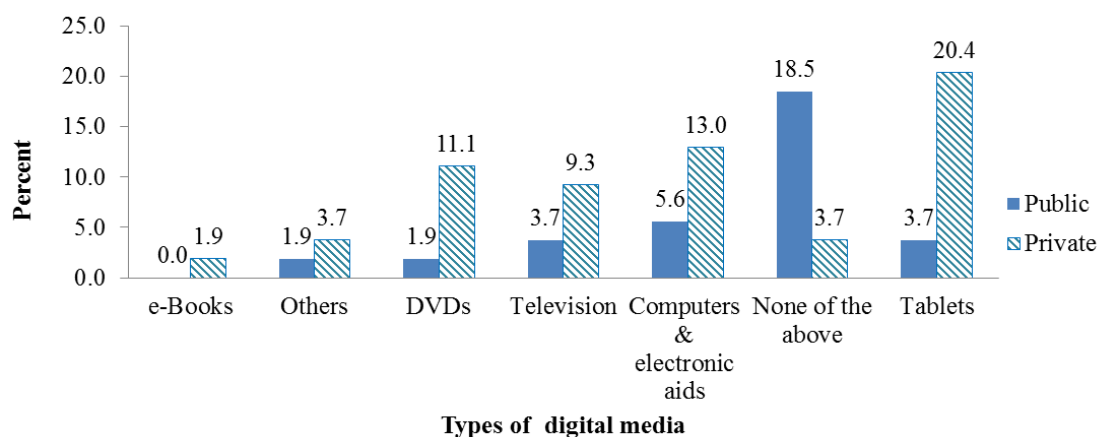
Source: Field Work, 2018

Figure 4.2: The main types of digital media being used in the ECDE center

Figure 4.2 indicates that there were a variety of digital media for ECDE teachers to use in teaching. The results also show that the most common media were tablets 24.1% (65) although most 20.4% (45) of these tablets were found in private ECDE compared to only 3.7% (20) in public ECDE centers. The second most frequently used digital media was computers and electronic learning aids 18.6% (50). This comprised of 5.6% (15) and 13% (35) from public and private ECDE centers respectively. The total number of schools which didn't have or use any digital media was 22.2%(60). Out of these, 18.5% (50) were public ECDE centers while 3.7% (10) were private schools. The schools which used televisions for teaching and learning of reading skills were 13% (35), with 3.7% (10), and 9.3% (25) from public and private schools respectively. Dvds gave a total of 13% (35), which indicated 1.9% (5) and 11.1% (30) from public and private schools respectively. There was low percentage of those schools which used other types of digital media not indicated in the histogram below. This totaled to 5.6% (15), from this, 1.9 % (5) was from public schools while 3.7 % (10) was from private schools. E-books indicated a total of 1.9% (5) which is an indication from private ECDE centers and none from public ECDE Centers.

Teachers responses on The Level of Digital Media Utilization

As shown in the Table 4.3 below, the level of utilization was generally higher in private ECDE 33.3% (18) centers than in public ones 3.7% (2). The study revealed that 20.4% (11) of teachers from the private ECDE centers indicated that the use of digital media was very high. The study further revealed that there was utilization of digital media was minimal in public ECDE centers. In particular, 7.4% (4) of the teachers from the public ECDE centers said that utilization level was very low. However, 5.6% (3) of the teachers said it was low in public ECDE centers. Meanwhile, about 20.4% (11) of the respondents indicated the utilization level was moderate. Out this, 1.9% (1) came from public ECDE while 18.5 %(10) from the private ECDE centers.

Table 4.3: Teachers responses on The Level of Digital Media Utilization

Levels	School type		Total
	Public	**Private**	
Very High	0(0.0%)	11(20.4%)	11(20.4%)
High	2 (3.7%)	18(33.3%)	20(37.0%)
Moderate	1(1.9%)	10(18.5%)	11(20.4%)
Low	3(5.6%)	4(7.4%)	7(13.0%)
Very low	4(7.4%)	1(1.9%)	5(9.3%)
Total	**10(18.5%)**	**44(81.5%)**	**54(100.0%)**
N= Private 44 **N= Public 10**			

Source: Author, 2018

The reasons given for the level of utilization ranged from whether the materials or the digital media were available or not and whether teachers were comfortable using the same. It also revolved the ease at which learners or pupils were able to use the gadgets. The following are some of the quotes from the respondents.

"High because most learners know how to operate most of the gadgets used with ease" (Teacher Cynthia from public school X).

"It is highly used since all the lessons in the class are conducted through digital media" (An anonymous male teacher from a private school).

"It is highly used since the school has a lot of materials." (Teacher Edith from private school C).

"High because most learners know how to operate most of the gadgets used with ease." (Teacher Joy from private school Y).

Those who indicated that the utilization level was low gave explanations which mainly revolved from inadequacy or the lack of gadgets. For instance, when asked to give his opinion about the level of utilization of digital media, teacher Peter from X, a private school within the study area had this to say; *"The level of utilization is low since we don't have them in our center"*. One of the respondents, a female teacher from a public ECDE Center said that, *"it is low because there are no digital media in the school"*

The following are other sentiments of the teachers in relation to the level of utilization in so far as digital media is concerned.

*"We don't use because the school has not provided" (*Teacher John from a public school M)

*"Digital media is not well used in our school. This is because they are not enough for use by all the pupils" (*Teacher Esther from public school D)

In summary, public pre-schools in Mavoko Sub-County in Machakos County have shown lower levels of readiness to use digital media compared to private schools. This has been ascribed to the readiness of the teachers in private schools to take up the use of digital media in teaching. Moreover, public schools in this study area do not have better ICT infrastructure installed compared to private schools. Such findings observed in this study coincide with other studies in the same sphere like The National Survey on Computer Education in Philippines (1996) and Nchunge et al. (2013).

Children's' responses on the Level of Utilization of Digital Media in the learning

In this objective, the study sought to establish the level at which the digital media was being utilized as the medium for teaching and learning reading skills. The author established that, there was a great difference between the responses given by teachers and those given by the children. Some teachers indicated that they used digital media in teaching but according to the learners, they had never seen it in the school. For instance, contradicting response like, "*i have never seen a computer, our teacher said she will bring one to our class". (Mary a pre-primary 2 pupil from private school D),* shows that in some schools digital media was never provided at all.

The Teachers' perception on the Effectiveness of Utilization of Digital Media

The last objective was to find out teachers' views on the effectiveness of utilization of digital media in teaching and Learning of reading skills. The sampled ECDE teachers were asked to rate the effectiveness of the digital media available in their class for learning of reading skills. As indicated in figure 4.3, more than a third 37% (69) teachers rated the effectiveness of using digital media in teaching reading skills in their pre-school center as very good. This included 14.8% (28) from public and 22.2% (41) from private ECDE centers. About 11.1%(21) and 7.4% (13)of the respondents from private and public ECDE rated effectiveness of digital media as good respectively which is a total percentage of 18.5% (34). Those who rated effectiveness of the use of digital media as moderate included 9.3% (17) from public ECDE and 13% (24) from private ECDE, this indicated a total of 22.3% (41) from both public and private ECDE centers. According to the findings, a total of 16.9% (31) which is 9.3% (17) and 7.4% (14) of the teachers from public and private ECDE rated effectiveness of using digital media as poor. About 5.6% (11) of teachers from both public and private ECDE center rated the use of digital media as very poor. This was 3.7% (7) teachers from public ECDE centers said that digital media was very poor in terms of teaching. This compared to 1.9 (4) from the private ECDE centers.

The current study supports findings by Sung et al., (2016) where it was observed that the use of digital media positively influenced learning and academic achievement. The author attributed this to the various distinctive features including individualized interfaces, real-time access to information, context sensitivity, instant communication, and feedback which were able to enhance the effects of certain pedagogies, such as self-directed learning, inquiry learning, or formative assessment.

Challenges facing teachers in utilization of digital media in teaching and learning of reading skills

This study found out that, there are a number of challenges that teachers face in utilization of digital media in teaching reading skills.

Table 4.4: Responses of Teachers on the Challenges Facing them in Utilization of Digital Media

Type of school	Availability	Use	Maintenance	Cost
Public	13(48.1%)	10(37.04%)	14(51.9%)	8(29.6%)
Private	2(7.4%)	3(11.1%)	5(18.5%)	5(18.5%)
Total	15(55.5%)	13(48.14%)	19(70.4%)	13(48.1%)
N= Private 44 **N= Public 10**				

Source: Author, 2018

From the analysis, it is clear that ECDE centers teachers face many challenges in the utilization of digital media. The challenges range from availability of the digital media, skills or use of the digital media, to maintenance and cost. Public schools posted the highest percentage of these challenges. Availability of digital media for use posted 48.1% (13) in public schools whereas in private schools it was 7.4% (2).This is an implication that, there is high provision of digital media in private ECDE centers than in public ones. Teachers in public ECDE centers posted a high percentage on the use of digital media than their counterparts in private ECDE centers which were 37.04% (10) and 7.4% (3) respectively. It is a clear indication that teachers in public ECDE centers do not have adequate skills in utilization of digital media. The responses also showed that there was a challenge on maintenance of digital media whereby public ECDE centers indicated a very high percentage of 51.9% (14), while private ones posted 18.5% (5). The cost the digital media was another major hindrance in utilization of digital media in teaching amongst teachers. Again, public ECDE teachers posted a high percentage of 29.6% (8) compared to private ECDE teachers who indicated a percentage of 18.5% (5).

7. CONCLUSION AND RECOMMENDATIONS

The study concludes that a variety of digital media are available in the private and public ECDE centers for teaching. However, the most frequently used digital media is computers and electronic learning aids as well as tablets. The study also concludes that the level of utilization of these instructional media is complex and revolved around many issues. The study established that there was a general low utilization level that was mostly exhibited in the public schools. The study concludes that the use of digital media in teaching and learning is effective although this depends on the extent to which the digital is utilized. This is probably the reason why majority of the teachers who rated effectiveness of the digital media as very good came from private ECDE centers.

The study recommends for the need for all the key stakeholders to be involved in looking for ways of encouraging and enforcing the utilization of digital media in the ECDE centers. More specifically, government, school administration and parents should consider the best ways of making sure there is adequate availability of appropriate digital media for teaching and learning of the ECDE children. These include the Ministry of Education, curriculum developers, pre-primary school college tutors and college managers. Proper implementation of curriculum which needs effective use of instructional media in teaching should be ensured by the Ministry of Education. This would ensure production of pre-primary school teachers who are able to use instructional media in teaching. This is because the current study found out that there was variety of instructional media in most of the ECDE centers which were regrettably not employed. There is need for the government to emphasize more on setting up the ICT infrastructure in public schools that can benefit schools as the same manner as it can been seen in private schools. The government should promote training of teachers in public schools through in-service trainings to furnish them with skills on how better they should employ ICT infrastructure for content delivery.

REFERENCES

[1] Adebi-Caesar, T. E. (2012). *Assessment of I.C.T situation in senior high schools: A case study in lower Manya Krobo District*. Kwame Nkrumah University of Science and Technology: Unpublished Master's Thesis.

[2] Agyei, D. D., & Voogt, J. (2012). Developing Technological Pedagogical Content Knowledge in Pre-Service Mathematics Teachers through Collaborative Design. *Australasian Journal of Educational Technology*, 28(4), 547–564.

[3] Aktaş, E., & Yurt, S.U (2017). Effects of Digital Story on Academic Achievement, Learning Motivation and Retention among University Students *International Journal of Higher Education* Vol. 6 (1): 180-196

[4] Alharbi, E. (2014). A Study on the Use of ICT in Teaching in Secondary Schools in Kuwait. Cardiff Metropolitan University, Unpublished PhD Thesis

[5] Amuko, S., Miheso, M., Ndeuthi, S. (2015). Opportunities and Challenges: Integration of ICT in Teaching and Learning Mathematics in Secondary Schools, Nairobi, Kenya. *Journal of Education and Practice*. Vol.6 (24):1-7

[6] Hobbs, R., & Moore, D. C. (2013). *Discovering media literacy: Teaching digital media and popular culture in elementary school*. Thousand Oaks, CA: Corwin

[7] Hung, C.M., Hwang, G.J. & Huang, I. (2012). A project-based digital storytelling approach for improving students 'learning motivation, problem-solving competence and learning achievement. *Educational Technology & Society*, 15(4), 368-379

[8] Kaindio, M.P., & Wagithunu, M.N. (2014). Integrating Information Communication Technology Skills in Primary Education in Kenya, *Mediterranean Journal of Social Sciences, Vol. 5(5):* 89-104

[9] Kathomi, M.S. (2015). Parental Involvement and the Literacy Development of Preschoolers in Lang'ata Division. Unpublished Master's Thesis, University of Nairobi

[10] Kok, M. C., & A. S. Muula (2013). Motivation and job satisfaction of health surveillance assistants in Mwanza, Malawi: an explorative study. *Malawi Med J* 25(1): 5-11

[11] Kucirkova, N., & Littleton, K. (2016). The digital reading habits of children: A National survey of parents' perceptions of and practices in relation to children's reading for pleasure with print and digital books, Book Trust. Available from: http://www.booktrust.org.uk/news-and-blogs/news/1371

[12] Lawani, L (2014). The Effect of Digital Storytelling on Kindergarten Pupils' Achievement in Moral Instruction in Basic Schools in Oyo State. *IOSR Journal of Research & Method in Education (IOSR-JRME)* Volume 4, Issue 5 Ver. V, PP 26-34

[13] Linebarger, D. L. (2015). Super why! To the rescue: Can preschoolers learn early literacy skills from educational television? *International Journal for Cross-Disciplinary Subjects in Education*, 6(1), 2060–2068.

[14] Livingstone, S., Mascheroni, G., & Staksrud, E. (2015). *Developing a framework for researching children's online risks and opportunities in Europe*. London: EU Kids Online

[15] Malero, A., Ismail , A., & Manyilizu , M.(2015).ICT Usage Readiness for Private and Public Secondary Schools in Tanzania, a Case of Dodoma Municipality. *International Journal of Computer Applications Volume* 129(3):29-32

[16] Mares, M.-L., & Pan, Z. (2013). Effects of Sesame Street: A meta-analysis of children's learning in 15 countries. *Journal of Applied Developmental Psychology*, *34*(3), 140–151.

[17] Miima, F., Ondigi, S., & Mavisi, R. (2013). Teachers" perception about integration of ICT in teaching and learning of Kiswahili language in secondary schools. *International Journal of Arts and Commerce, 2*(*3*), 27-32.

[18] Mingaine, L, (2013) Challenges in the implementation of ICT in public secondary schools in Kenya. *International journal of social science and education.* 4(1), 224-238.

[19] Mudaki, J.B. (2011). *Supervision of ECDE Programmes. Implication for the provision of quality Early Childhood Education in Nairobi province.* Government Printers, Nairobi

[20] Murundu, Chisikwa, Indoshi, Okwara & Otieno (2012). Teacher based factors influencing implementation of early childhood development and education curriculum. Bondo University college.

[21] Ngwu, O.G, (2014). Assessment of availability and utilization of ICT resources in teaching in F.C.E Eha-Amufu Enugu Nigeria. ICELW 2014

[22] Normann, A (2012). *Digital Storytelling in Second Language Learning, in Faculty of Social Sciences and Technology Management (Norwegian University of Science and Technology, 2011), p. 125 A Normann, Digital Storytelling in Second Language Learning.* Unpublished PhD thesis, Norwegian University of Science and Technology

[23] Nuuyoma, E. (2012). *Challenges faced by English Teachers in integrating information and Communication technology in the teaching of reading and writing in two rural primary schools in the Omusati Region and four urban primary schools in the Khomas Region of Namibia*. University of Namibia: Unpublished Masters Thesis.

[24] Pathak-Shelat, M., & DeShano, C. (2014). Digital youth cultures in small town and rural Gujarat, India. *New Media & Society*, 16(6), 983-1001

[25] Selwyn, N. (2016). *Is technology good for education? (Digital futures)*. Cambridge, England: Polity Press.

[26] Sung, Y., Chang, K., & Liu, T (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education* Volume 94: 252-275

[27] UN (2017).The Role of Media in Promoting Strategies for Poverty Eradication, UN: New York, NY

[28] Uwezo (2016). Are Our Children Learning? Uwezo Kenya Sixth Learning Assessment Report. Nairobi: Twaweza East Africa