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

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ABSTRACT

Digital media play a key role in education as it foster learner's engagement; ease understanding of complex concepts with multiple resources. This study aimed at assessing the effect of utilization of digital media in teaching and learning of reading skills among preschool pupils in Mavoko sub-county, Machakos County, Kenya. Technology has revolutionized teaching and learning at all levels of education globally. The research objective establish the effect of use digital media on teaching and learning of reading skills in ECDE centers within Mavoko Sub-county, Machakos County and find out the views of teachers on the level of utilization of digital media in teaching and Learning of reading skills. The study adopted the descriptive survey research design. The study targeted head teachers, teachers, and children from both public and private ECDE centers. Data was collected using questionnaires and face to face interview schedule. The data was analyzed using descriptive data analysis technique that included frequencies, cross tabulation mean and standard deviation and inferential data analysis technique, regression analysis. The study revealed that digital media used in teaching and learning in ECDE included computers and tablet electronic to a great extent. The results revealed that use of digital media as a significant and positive effect on teaching and learning of reading skills among pupils in ECDE centres. The study concluded that use of digital instructional media has a significant and positive effect on teaching and learning of reading skills among pupils in ECDE Centers. The study recommends policy framework should be developed to guide use of digital media in teaching and learning of reading skills among pupils in ECDE centers. This would promote use of digital instructional media in the ECDE centers to increase level of deployment of digital media in teaching in ECDE centers in teaching and learning to promote acquisition of reading amongs pupils in ECDE centers in Kenya.

Key Words: *Digital instructional media, Use of Digital media, Teaching and Learning of Reading Skills*

1.0 INTRODUCTION`

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. 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. A 2016 Digital Study Trends Survey in the US found that 46% of students used mobile device to improve on their academic performance. With digital media coming into focus for learners, educators are integrating educational media into their classrooms. Beschorner and Hutchison (2013) observed 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.

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). 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). In Kenya, reading skills in pre-school children have remained static over the years (Uwezo, (2016). Only 3 out of 10 children in class 3 can do class 2 works and on average 1 out of 10 children in Kenyan Primary schools is completing class 8 without having acquired the basic reading 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. However, there is little research on effect of utilization of digital media on teaching and learning of reading skills among pupils in ECDE centers in Kenya. 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.

1.1 Statement of Problem

Poor performance in early literacy and kindergarten achievement is still report in Kenya. This is despite various programs such as Tayari implemented to improve in young children's readiness to learn as well as working with pre-school children to enhance attainment of literacy skills

(Kathomi, 2015). According to a study by Uwezo, (2016) about 28% of children in Kenya leave primary school unable to read and write fluently. Mavoko sub-county is one of the sub-counties in Kenya with literacy levels estimated at 21%. This motivates deployment of Digital media in ECDE teaching and learning to foster literacy (Mares & Pan, 2013). So far, there is no adequate research on effect of use of digital media on teaching and learning of reading skills, especially Mavoko Sub-county. Therefore, this study sought to examine effect of use of digital media on teaching and learning of reading skills among pupils in ECDE Centres in Mavoko sub-county, Machakos County, Kenya.

1.2 Objective of the Study

The broad objective of this study was to investigate effect of usage of digital media in teaching and learning on reading skills among children in ECDE in Mavoko Sub-County, Machakos County

2.0 LITERATURE REVIEW

2.1Theoretical Framework

This study was guided by Media richness theory and Emergent Literacy 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 developed by Richard Daft and Robert Lengel in the 1980s (Daft & Lengel, 1984). 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. The theory assumes that individuals' performance improves with the use of richer media for equivocal 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. 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 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. 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

2.2 Digital Media used in the Education Sector

Digital media generally presents knowledge in a manner different from traditional printed media, and as such tend to transform traditional ideas of literacy and knowledge (Livingstone, 2003, p. 154). Digital learning resources tend to support information processing by assisting learners or students to establish mental representations through the different digital media given to them. In particular, digital learning resources include television, DVDs, tablets, computer games, Electronic books (e-books) and electronic learning aids (ELAs). Sung, Chang and Liu (2016) observed 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. According to Boadu, Awuah, Ababio and Eduaquah (2014) posited that computers, projectors, internet, and audio-visuals are main instructional media that are being used in teaching and learning process in pre-school centres.

Introduction of digital media infused with lessons may prove to be a beneficial motivator for students irrespective of the class or education level. Hung et al. (2012) explain that technology has positive effects on student motivation. Baroody and Diamond (2013) also found that some children exhibit high levels of interest when actively interacting with digital media especially those that have manipulative. An empirical study 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.

2.3 Effects of Digital Media in Teaching and Learning in Reading Skills in Preschools

The use of digital media tends to revolve around their functions (Kok & Muula, 2013). Digital media has become integral in the teaching and learning process today. According to Tony Hicks, (2013), digital learning opens up the scope and possibilities for education and training and enhances the learning experience. Digital media in education opens up a huge world of possibilities as to how one conveys, shares and engages with students presenting different ideas, facts and theories. Digital media is associated with a wide range of opportunities and possibilities. 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. Many schools today are privileged to have access to digital media, trained teachers, and a favourable policy environment to foster use of digital media. In another study, Wajszczyk (2014) assessed the impact of technology in early education and found that introduction of ICT into early education improve academic performance among the pupils in primary schools. Amuko, Miheso and Ndeuthi (2015) observed that new frontiers on technology integration available to both educators and learners enhance learning hence to foster access to information.

Abdullah's study (2012) endeavored to study the extent of using ICT-based technology by teachers at ECDE levels in the learning process. The results revealed that teachers employ in moderation ICT-based technology for learning process and administrative purposes. Al Jaraydeh (2012) conducted a study intended to investigate the impact of ICT-aided instruction on the first secondary grade students in Arabic Language grammar. The study revealed that statistically significant differences were found in the level of achievement among the first secondary grade students in Arabic grammar in favour of ICT-assisted method. Additionally, the results show a statistically significant differences in the level of achievement among the first secondary grade students in Arabic Language grammar, in favour of females.

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.

2.3 Conceptual Framework

Figure 1 below shows interrelatedness of independent and dependent variables.

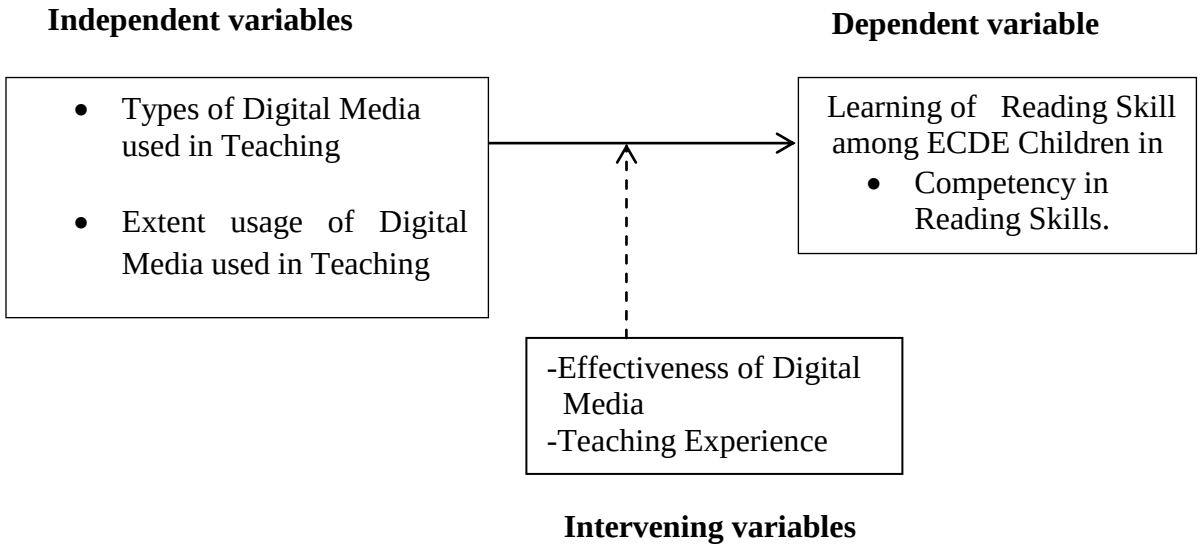

Figure 1: Conceptual Framework

The conceptual framework displayed in Figure 1 is based on the argument that use of different type of digital media in teaching ECDE children has an effect on competency in reading skills. Effectiveness in the use of digital media among ECDE teachers foster acquisition of reading competencies among the ECDE children

3.0 RESEARCH METHODOLOGY

The study adopted descriptive survey research design.The study targeted all ECDE centers within Mavoko, both private and public using digital media in teachning and learning process. The study targeted ECDE children and teachers within Mavoko Sub-county. 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. Descriptive and inferential data analysis techniques were deployed . Data was

presented by use of tables, pie-charts and histograms. Qualitative data was transcribed, analyzed thematically and presented using verbatim quotations and narrations.

4.0 FINDINGS AND DISCUSSIONS OF RESULTS

4.1 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 1.1 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 1.1 summarizes the findings.

Table 1.1: Gender Composition of the ECDE Teachers

	School Type		
Gender	**Public**	**Private**	**Total**
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%)

Source: Author, 2018

The current findings therefore implied 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.

4.2 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.

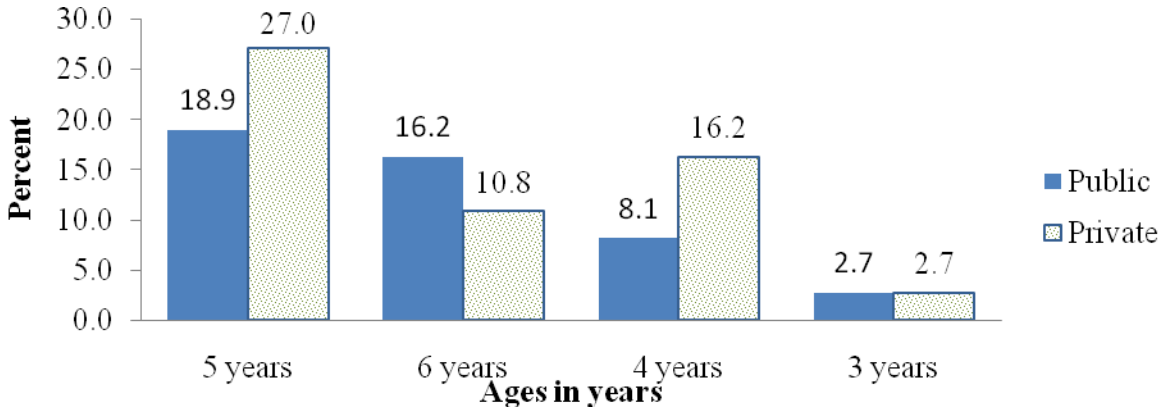

Figure 1.1: Distribution of ECDE children according to their age groups

Source: Author, 2018

The figure 1.1 indicates the distribution of ages of preschool children in the selected ECDE Centers in Mavoko Sub-County was between ages 3 to 6 years. Trend observed in Figure 1.1 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.

4.3 ECDE Teachers Experience in the School

Table 4.2: ECDE Teachers Experience in the school

	School Type		
Response	Public	Private	Total
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%)

Source Author, (2018)

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 1.1. Results in Table 1.1 indicate that about 9.3% of the respondents had been teaching at the school for 2 years. About 24.1% had taught for 3 years and 24.1% had been teaching for 4 years. Also, 42.6% had taught at their respective schools for 5 years. The findings therefore demonstrated that majority of teachers had taught at the school for 5 years. Murundu, et al, (2012) revealed that teachers' experience in use of ICT in teaching impact on effect of digital media on learning outcome.

Adegbija and Fakomogbon (2012) in their study on the use of instructional media in teaching and learning in selected schools in Nigeria also acknowledged the importance of the skills accumulated by teachers with years of exposure especially in relation to teaching resources. Mudaki (2011) found that (84.4%) of the pre- primary school teachers had worked for two years and above, while the remaining (15.6%) had less than 1 year of working experience. This implied that majority teachers have rich teaching experience to enable them use music as a medium of instruction. This implied that majority of the pre- primary school teachers had enough teaching experience to implement the use of music as a medium of instruction in preschools.

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

The study sought digital media being used in teaching and learning of reading skills in ECDE Centers in Mavoko sub-county, Machakos County. The findings are as presented in Figure 1.2

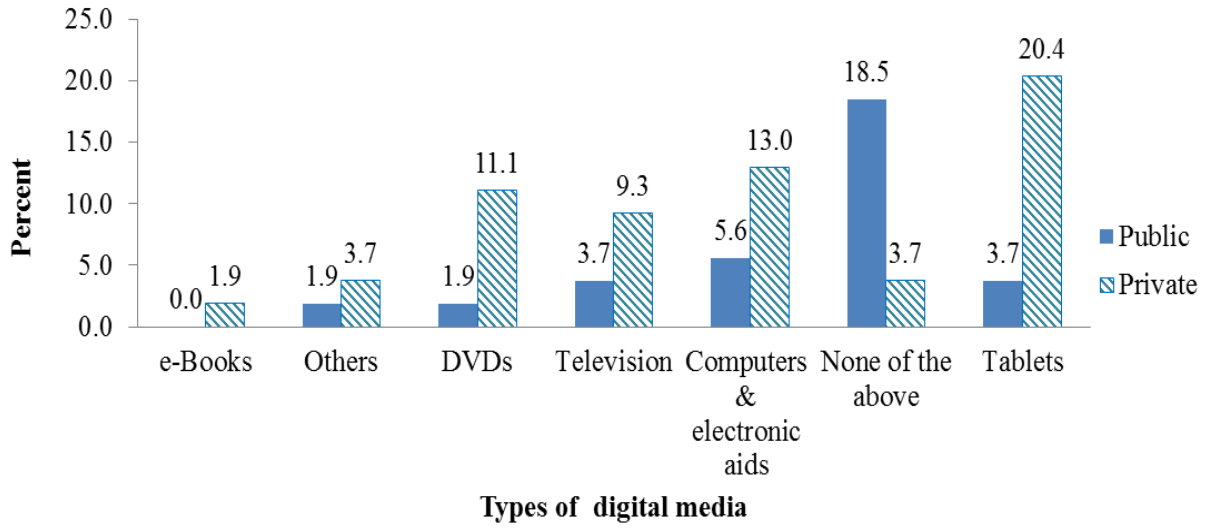

Figure 1.2: The main types of digital media being used in the ECDE center

Source: Field Work, 2018

Figure 1.2 indicates that there were a variety of digital media for ECDE teacher's uses in teaching. The results also show that the most common media used were tablets 24.1% (65). The second most frequently used digital media was computers and electronic learning aids as indicated by 18.6% (50). The total number of schools which didn't have or use any digital media was 22.2 %(60). The schools which used televisions for teaching and learning of reading skills were 13% (35). The results indicated that Dvds was used in teaching s indicated by 13% (35) of the respondents. E-books indicated a total of 1.9% (5) which is an indication from private ECDE centers.

4.5 Effect of Digital Media Utilization in teaching and Learning in Preschools.

As shown in the Table 1.3, utilization of digital media was generally high as indicated by 37% (20). The study revealed that 20.4% (11) of teachers indicated that the use of digital media was very high or moderate. The study further revealed that there was utilization of digital media was low as indicated by 13% (7) while 9.3% indicated that utilization of digital media in teaching and learning in ECDE centers was very low. This clearly indicated that there was use of digital media in teaching and learning in reading skills among preschool children.

Table 1.3: Teachers responses on The Level of Digital Media Utilization

Levels	Frequency	Percent
Very High	11	20.4%
High	20	37.0%
Moderate	11	20.4%
Low	7	13.0%
Very low	5	9.3%
Total	54	100.0%

Source: Author, 2018

The results were supported by interviewees who provided reasons on effect of utilization range of 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).

"*This is because most of the children know how to operate the laptops and computers and most teachers are comfortably using them in teaching."* (Teacher Joan from private school X).

Table 1.4: Regression Results on Level of Utilization of Digital Media and Learning Reading Skills

Model	Unstandardized Coefficients Beta	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	3.082	.570		5.409	.000
Digital media Use	.664	.0605	.265	10.987	.002
R	. 878[a]				
R Square	.771				
Adjusted R Square	. 770				
F	52.787				
Sig	.0014[b]				

The study sought to establish effect of use of digital media on learning of reading skills among preschool learners in Mavoko sub-county, Machakos County, Kenya. From the regression findings in Table 1.4, R Square was 0.771 indicating that there is a significant variation 77.1% between utilization of digital media in teaching and learning of reading skills among preschool learners. Regression results indicated that use of digital media has a significant and positive effect on teaching of reading skills among preschool learners as β_1 =0.664, PV= 0.002<0.05 and t=10.987. This implied that a unit increase in use of digital media in teaching and learning has an increase in learning reading skills among learners in ECDE in Kenya by 0.664. According to Sung, Chang and Liu (2016) utilizing mobile devices with teaching and learning on pupils' learning performance, acknowledge that digital media such as laptops, mobile phones.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. Boadu et al. (2014) while looking at the state of the use of digital media in selected Schools within the Cape Coast metropolis in Ghana also established that teachers were

positive about the use of digital media in teaching except they 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. The current study supported by Sibanda, et al. (2016) that utilization of ICTs for teaching and learning in Secondary schools was to a low extent at Kwekwe, Zimbabwe. Like the current study, the author observed that the available ICTs were being utilized to a very low extent.

5.0 CONCLUSION OF THE STUDY

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.

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