

## **Influence of Teachers' Status of Digital Literacy on Integration of Digital Technologies in Early Years of Education in Kenya.**

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### **ABSTRACT**

Today's children are growing up in a rapidly changing digital age that is different from that of their parents and grandparents with variety of technologies all around their homes and schools. One of the Kenyan national goals of education is to promote technological and industrial needs for national development. One guiding principles of Kenyan Basic Education Act 2013 is that education should promote innovativeness, inventiveness creativity, technology transfer and an entrepreneurial culture among learners. However, report from Teacher Performance Appraisal and Development (TPAD) from the ministry of education (Kisumu Central Sub-County) shows a low level of integration of digital technologies in early years of education. The purpose of this study therefore was to investigate the influence of teacher preparedness on integration of digital technologies in early years' of education in Kenya. The study objective was to establish the influence of teachers' status of digital literacy on integration of digital technologies in early years of education. The study adopted Concurrent triangulation design within the mixed method approach. The study was anchored on Davis (1986) Technology Acceptance Model and Preparedness Theory by Seligman (1971). The study targeted 345 teachers from Kisumu Central Sub-County. The study adopted saturated sampling to sample preschool and standard two teachers, stratified random sampling to sample head teachers and standard three teachers and purposive sampling to sample standard one teachers. The sample size comprised of 90 preschool teachers, 75 grade one teachers, 75 grade two teachers, 23 grade three teachers and 9 head teachers. The data collection instruments were structured questionnaires, interview schedules and focus group discussion. Validity was ensured by expert judgment from university supervisors. Cronbach Alpha was used establish reliability and the subscales met the recommended threshold. Trustworthiness of qualitative data was ensured by use of multiple sources of data. Descriptive statistics, Pearson correlation and linear regression were used to analyze quantitative data. The Qualitative data was analyzed using Thematic Analysis

Approach. The study findings showed a significant ( $n=202$ ;  $r =.711$ ;  $p < 0.05$ ) highly positive correlation between status of digital literacy and integration of digital technologies. The teachers' status of digital literacy was also found to be high. The study recommended that the ministry of education should enhance their supervision on the implementation of integration of digital technologies in classroom teaching.

**Key words;** Integration, Early Years Education, Digital Literacy, Teacher Preparedness

## **1.0: Introduction**

### **1.1 Background to the Study**

Technologies are tools, digital devices and other electronic machines or equipment that delivers media (Levin, 2013). Young children today live in a world of digital technologies that are rapidly becoming the tools of culture at home, in school and the community at large (Kerawalla & Cook, 2003). Digital technologies have become tools of for communication, collaboration, social networking and user generated content that have transformed mainstream culture (Flewit, 2011). The tools have transformed how families and parents manage their daily lives, teachers use materials in the classroom with young children and how teacher education and professional development is delivered (Rideout & Vandewater, 2007). The pace of change is so rapid that society is experiencing a disruption almost as significant as when there was shift from oral language to print literacy (American Academy of Pediatrics, 2011).

The history of digital technologies in education can be traced back many thousands of years before the first development of reading and writing (Moursund, 2007). The wide spread use of digital technologies has till now influenced all fields in life, among which lies education. Many countries see digital technologies as a potential tool for change and innovation in the education field (Erdogan, 2009) and thus they make large investments in the integration of digital technologies in schools. According to Pelgrum and Law (2003), digital technologies in education became popular in educational policy-making in the early 1980s when consumer market began the sale of cheap microcomputers. They also noted that by the early introduction in 1980s education was expected to be more effective and motivating.

Technology motivates learners to learn, complete tasks that might bore them with pencil and paper, provides creative ways to solve problems and offers a risk free learning environment for learners to explore the world ((Bauer & Kenton, 2011). The Institute of Medicine of the National Academies

(IMNA) (2011) recommends that child care settings limit screen time for pre-schoolers. But the prevalence of electronic media in the lives of young children means that they are spending an increasing number of hours in front of and engage with screens of all kinds including televisions, computers, smart phones, tablets, hand held game devices, laptops and video games among others (Flewit, 2011). National Education for Young Children (NAEYC) (2012) asserts that technology and interactive media are tools that can promote effective learning and development when they are used intentionally by early childhood educators within the framework of developmentally appropriate practice. Teachers have been conscious about the quality of their teaching. To enhance the quality, Sansanwal, (2012) argues that teachers use teaching aids like charts, models, specimen and slides because they are given training both in preparation and use of audio visual aids. However Mondal and Paul (2012) established that there is close association among the factors like relative advantage of ICT and quality of education. They further indicated that the magnitude of quality education lies in its ability to organize ICT through establishment of proper infrastructure in the school.

It is important that computer literacy and education be part of the curriculum for children in all parts of the world (Dennis, 2011). South Africa's children especially in disadvantaged communities and townships have never interacted with computer before and the majority of children are growing up in a computer illiterate environment. Technology is one of the eight subjects taken by learners in senior phase (grade 7-9) as part of their school curriculum (Makgato, 2013). Since the subject was introduced in 1998 and revised in 2002, most teachers are still battling with its implementation particularly at the rural school. Further researches reveal that there are a number of factors constraining the uptake and development of technology education in South Africa (Stevens, 2013). Emerging from data on the study about technology teacher education in South Africa is the need to ask whether such programmes fulfil the needs of teachers of technology and technology education, Stevens (2013).

Ramorola (2011) in South Africa supported the view that a computer can provide equal opportunities and required context to children from all types of socio-economic and cultural backgrounds to achieve basic levels of literacy and education. However, Mokoena (2012) indicated that pre-service teachers reported feeling better prepared to use computers in classroom in the following year after their training than their experienced counter parts already in the field. In Tanzania Hennesy, Harison and Wamakote (2010) indicated that changing landscape of communications and information exchange in the 21<sup>st</sup> century requires that teachers be at the cutting

edge of knowledge, production, modification and application rather than consumption. The study further revealed that teachers need to be prepared and educated to use ICT effectively and creatively.

Information and communication technology (ICT) is instrumental in conducting human affairs globally. Early access to ICT has greatly benefited developed countries, enriching their teaching and learning process. In Uganda Kaahwa (2013) established that Uganda needs a continuous program for training teachers in computer use in teaching the various subjects. The study further indicated that Uganda needs educational software and schools need to avail teachers time needed for computer use. On the other hand Naikumi (2013) indicated that most teacher training institutions in Uganda do not integrate computer literacy into their curriculum. The Kenyan Basic Education Act 2013 defines ICT Integration in education as a seamless incorporation of information communication technologies to support and enhance the attainment of curriculum objectives, to enhance the appropriate competencies including skills, knowledge, attitudes and values and to manage education effectively and efficiently at all levels. One of the guiding principles of this fundamental Act is the promotion of innovativeness, inventiveness creativity, technology transfer and an entrepreneurial culture among learners.

There is evidence from research that ICT can help pupils to learn and teachers to teach more effectively. But, Kukali (2013) in Kenya established that there was a wide digital divide in use and integration of ICT in classroom. The study further recommended that ministry of education increases the budgetary allocation to cater for capacity building and infrastructure to fill the gap of digital divide. On the other hand, Odera (2011) established that the ministry of education policy on the use of computers was being implemented by public secondary schools however study further suggested that all teachers, students and school community should be informed about the policy and the importance of its implementation. .But Okeyo (2013) revealed that training level of head teachers in the use of computer is low. The study further indicated that head teachers' attitude towards the use of computers is positive.

Kenya government has invested a lot of funds in ICT infrastructure including digitization of educational materials through Kenya institute of education for achievement of vision 2030 (Andiema, 2015). A course on ICT integration in education started with a face to face three day workshop at the center for mathematics science and technology education in Africa. The main aim was to develop Kenyan teachers' skills knowledge deepening and more specifically in applying

principles of ICT in education at all levels of education (UNESCO, 2016). Teacher training remains a critical component of integrating ICT in education and the ministry of education science and technology (MOEST) has been mandated to develop a skilled and innovative manpower and works towards the integration of ICT at all levels of learning. As a country, Kenya has worked towards developing capacities and competencies in order to participate at the global level. Thus the country has prioritized ICT through strategic plan namely 'vision 2030'. ICT is a fundamental component of the education reforms and thus ICT's integration in Kenyan education system has been largely supported by the Ministry of Education Science and Technology (MOEST 2012). The National ICT Policy (2006) recognizes the fact that there is need to strengthen and streamline the training through promoting ICT in basic education by developing ICT curricula and ensuring that teachers/trainers possess the requisite skills. The policy further stipulates that ICT should promote the growth and implementation of e-learning and integrate e-learning resources with other existing resources.

According to MOEST (2016) over 66000 teachers have already been trained on how to use the early digital literacy devices for teaching and learning. At the same time, A task Force by (MOEST 2012) on the realignment of the education sector to the new constitution of (2010) and Kenyan vision 2030 mandated Kenya Institute of Education to develop a comprehensive curriculum for Early childhood education to include computer games in-order to introduce and enhance computing skills in young children. However, report from Teacher Performance Appraisal and Development (TPAD) from the ministry of education (Kisumu Central Sub-County) shows a low level of integration of digital technologies in early years of education. According to this assessment tool, teachers are supposed to access and integrate appropriate ICT learning and teaching materials to improve knowledge and stimulate learning.

## **1.2 Statement of the Problem**

Young children today are growing up at ease with digital devices that are rapidly becoming tools of the culture at home, school and in the community. These digital devices when built upon solid developmentally appropriate foundations can improve education quality at this early stage of learning. Kenyan vision 2030 recognizes the importance of integrating technology into education curriculum. Kenyan Basic Education Act 2013 guiding principle on ICT integration in teaching and learning states that ICT should promote innovativeness, inventiveness creativity, technology transfer and an entrepreneurial culture among learners. The Kenyan National ICT Policy (2006)

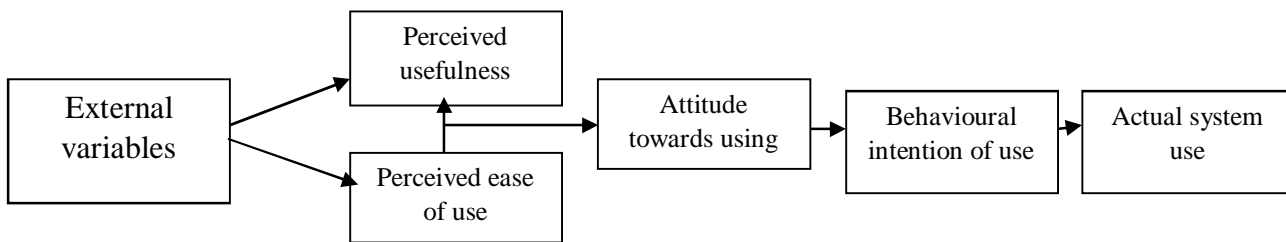
recognizes the fact that there is need to strengthen and streamline the training through promoting ICT in education at all levels by developing ICT curricula and ensuring that teachers/trainers possess the requisite skills. The policy further stipulates that ICT should promote the growth and implementation of e-learning and integrate e-learning resources with other existing resources. However, report from Teacher Performance Appraisal and Development (TPAD) from the ministry of education (Kisumu Central Sub-County) on integration of digital technologies in early years of education shows very low levels of integration of digital technologies in early years of education. And with more and more children encountering digital technologies before going to school, research on influence of teachers' preparedness for the integration of these digital technologies into classroom teaching remains crucial. Surveys reveal that most researches on technology integration into curriculum within Kisumu County have focused on secondary schools with scant attention given to early years of education. This study therefore addressed this gap in literature by focusing on the influence of teachers' preparedness on integration of digital technologies in early years' of education in Kisumu Central Sub- County.

### **1.3: Theoretical Framework**

This study was anchored on Technology Acceptance Model (TAM) originally proposed by Davis (1986). It is a theoretical model helping to explain and predict user behaviour of information technology. According to Lagris, Ingham & Collnete (2003), TAM is considered an influential extension of Theory of Reasoned Action, (TRA). According Davis (1986) TAM is proposed to explain why a user accepts or rejects information technology adopting TRA. TAM provides a basic with which one traces how external variables influence belief, attitude and intention to use technology.

Two cognitive beliefs are posited by TAM; perceived usefulness and perceived ease of use. According to TAM, one's actual use of technology system is influenced directly or indirectly by the user's behavioral intentions, attitudes, perceived usefulness of the system and perceived ease of use of the system. TAM assumes that perceived usefulness ("the degree to which a person believes that using a particular system would enhance his or her performance" and perceived ease of use ("the degree to which a person believes that using a particular system would be free of effort") with the influence of pre-existing external variables being the primary determinants for adoption of a new

technology. As adopted in the current study, Perceived ease of use has direct effect on perceived usefulness and both determine the consumers' attitude towards use, which leads to behavioural intention to use the system and actual use of the system, (Davis, 2002; Lu, 2003). TAM also proposes that external factors affect intention and actual use through mediated effects on perceived usefulness and perceived ease of use. Figure 1.1 depicts original Theory of Technology Acceptance model.



**Figure 1.1; Original Technology Acceptance Model (TAM)**  
**Source: Davis (1989) as cited by Nchunge, Sakwa & Mwangi (2012).**

TAM appears to be able to account for 40% to 50% of user acceptance. In general variables related to the behavioural intention to technology or to the actual use of information technology could be grouped into four categories: individual context, system context, social context and organization context. While social context means social influence on personal acceptance of information technology use, Thong, Hong, & Tam (2002) identified relevance system visibility and system accessibility as perceived ease of use of a digital library. Lin & Lu (2000) similarly reported that higher information accessibility brings about higher use of information and higher perception of ease of use. As adopted in this study, teacher preparedness for the integration of digital technologies refers to the degree of ease with which teachers can use digital technology in preschool and lower primary schools as an individual factor. Therefore, elements of perceived ease of use such as teachers' digital literacy, relevancy and adequacy of teachers' training, teachers' ICT advancement towards integration of digital technologies were investigated together with teachers' perception of integration of digital technologies under perceived usefulness.

## 2.0: Literature Review

The constant change in technological advances, the information explosion and the rapid knowledge acquisition is demanding a new learning environment in schools, Aswagan &Aswagan (2014). A study conducted by Son & Robb (2012) on the relationship between computer literacy and competency of Indonesian teachers of English as a foreign language used in service teachers of Indonesian schools and universities as study participants. The teachers were invited to respond to a questionnaire containing questions related to the teachers' ownership and accessibility of computers, their level of ability to perform computer based tasks, their personal and professional use of computers and their interest in computers assisted language learning. The findings of the study revealed that computer literacy is significantly related to teachers' competency in teaching English language as a foreign language. The above reviewed study only collected quantitative data meaning that qualitative data which gives an in depth information of the matter at hand was missing. The current study bridged this gap by collecting both quantitative and qualitative data thereby adding literature to the existing body of knowledge. The reviewed study was also conducted in the university where students are young adults unlike the current study where majority of learners are predominantly preadolescents. The current study bridged this gap in literature.

One study by Konan (2012) in Turkey on computer literacy levels of teachers and how the levels influence the use of computer used 506 teachers as the study sample size. The obtained results were analyzed using T-test and one way analysis of variance. Computer literacy level and use of computers by teachers were found to be statistically significant with high teaching experience and also teachers with high level of education. The reviewed study only used inferential statistics to analyze data, hence it lacked in-depth information from qualitative data. The current study bridged this gap by analyzing both qualitative and quantitative data thereby filling gap in literature.

Karim, Nerina and Neil (2016) investigated integrating digital technologies in the classroom in Australian university. The study conducted interviews with university lecturers. The study outlined aspect of the flipped classroom approach and looks at how school of education in Australia University servicing rural and remote areas is integrating this approach in their pedagogy. It was established that flipped chart classroom approach has gathered a lot of attention and challenges among university lecturers. The above reviewed study focused at the university where the students



are young adults and have had a lot of exposure with digital technologies unlike the current study where learners are predominantly preadolescent children whose exposure to digital technologies are still limited. The current study bridged this gap in literature.

Salvati, (2016) investigated the use of digital technologies in education United States of America. The study examined the complexity of teachers' everyday practice with digital technologies. The study adopted ethnographic approach where observations and interviews were undertaken. The findings indicated that the complexities of teachers' everyday practice as well as additional issues are different in regard to how the complexity is understood. The above reviewed study employed purely a qualitative approach hence it lacked the quantitative aspect, which would have provided for ease of generalization of findings. The current study bridged this gap in literature by employing both quantitative and quantitative approaches thereby filling gap in literature.

Ming-Hung, Huang-Cheng and Kuang-Sheng (2017) investigated effects of digital learning on learning motivation and learning outcome in China. The study targeted 116 students with four classes and questionnaire was used as the main data collection instrument. The study adopted a quasi- experimental research design. The study indicated that digital learning presents better positive effects on learning motivation than traditional teaching does. Digital literacy showed better positive effects on learning outcome than traditional learning. The reviewed study targeted students only hence it left a knowledge gap on views of teachers who have classroom teaching experience. The current study bridged this gap in literature by focusing on in-service teachers who are implementing the curriculum, thereby adding literature to the existing body of knowledge.

In Tanzania, Kafyulilo & Keengwe (2014) investigated teacher perspectives on their use of ICT in teaching and learning. The study was a case study in a secondary school. The findings showed that teachers have limited confidence in using technology to facilitate specific concepts or skills to support creativity and to support students to learn complex concepts. The above reviewed study was conducted in Tanzania and in secondary schools context leaving out preschools and lower primary schools. The current study bridged this gap by conducting a similar study in Kenya but in preschools and preschool primary school context thereby filling gap in literature.

Andema, Kendrick & Norton (2013) conducted a study to investigate digital literacy in Uganda teacher education. The study was a qualitative one and focused on the experiences of six language teacher educators in an urban primary teachers' college. Interviews, document analysis and

questionnaires were the data collection instruments. Data was analyzed by triangulating data from multiple sources. The study established that teachers were challenged by the inadequate training and culturally irrelevant materials in their training. The above reviewed study was purely qualitative hence it lacked a conclusive findings from quantitative data. The study also used a small size which was prone to a large margin of error. The current study bridged these gaps by collecting both qualitative and quantitative data and using a reasonable sample size thereby filling gap in literature.

Lubua (2015) explored the opportunities for integrating new technologies in Tanzania's classroom. The study adopted a qualitative approach. Both students and instructors were interviewed and data analyzed using open coding techniques in MAXODA. The study finding indicated that familiar and utilized digital tools, technology integrated in teaching and learning, learners and instructors use some digital tools in learning. The above reviewed study focused on higher learning institutions where learners are predominantly young adults unlike the current study where most learners are young children. The current study bridged this gap in literature by focusing on early years of education thereby adding literature to the existing body of knowledge.

Andema (2014) in Uganda investigated promoting digital literacy in African education. The study took a form of a qualitative case study in which data were collected using classroom observations, individual interviews focus group discussion, semi-structured questionnaire, art-facts and document analysis. The study found out that ICT policy had positively impacted curriculum development and classroom practices in the two rural teachers training colleges. The above reviewed study took a qualitative approach hence it lacked a conclusive findings from inferential statistics. The study was also conducted in teachers training colleges where learners are majorly young adults unlike the current study where learners are preadolescence. The current study bridged these gaps in literature by employing both the quantitative and qualitative approaches and targeting early years of education thereby adding literature to the existing body of knowledge.

In Kenya, Sulunga, Toili & Amadalo, (2011) investigated teacher related factors that are influencing the integration of information technology in the teaching of mathematics in secondary schools. An exploratory descriptive survey design was used. Mathematics teachers in 25 public secondary schools formed the study population. Purposive sampling was used in selecting schools with computers. The sample frame consisted of 147 mathematic teachers stratified into gender and simple random sampling was used to pick the required sample in each stratum. Data collection instruments were questionnaires, checklist and interview schedule and data that were collected

analyzed by use of descriptive statistics. The findings indicated that there was a statistically significant positive relationship between related factor and integration of information technology. The only aggravating action is the technical know-how and necessary computer skills essential in guiding pedagogical activities towards effective and proper utilization of the computer technology. The above reviewed study was carried out in secondary schools where students are a bit mature unlike the current study where learners are generally young children. The present study bridged this gap by conducting a study in early years of education thereby filling gap in literature.

Another study in Kenya by Ouma, Awuor & Kyambo, (2014) investigated E- learning readiness and how it relates to integration of e-learning resource in secondary schools. The study used a survey design to examine the level of technical competency and computer literacy among teachers, their attitudes and perception towards the use of E-learning. Five secondary schools within the study area served as the target population. The findings showed that teachers are ready to embrace E-learning technology, but there is need to enhance their technical capacity through training for successful E-learning adoption. The above reviewed study was carried out in secondary schools where learners are mostly adolescents unlike the current study where learners are majorly young children. The current study bridged this gap by carrying out the same in early years of education thereby adding literature to the existing body of knowledge.

Miima, Ondigi & Mavisi, (2013) examined influence of teachers' perception on integration of ICT in teaching and learning of Kiswahili language in secondary schools in Kenya. A survey design technique was adopted. Forty five teachers were selected to be study participants. Questionnaire and interview protocols were used to collect data. The data collected was analyzed through descriptive statistical technique. The study established that there is a positive relationship between teachers' perception and integration of ICT in teaching and learning of Kiswahili language. The study concluded that integration of ICT has not taken roots among the Kiswahili language teachers compared to the science and computer related areas despite the government through the ministry of education trying to equip schools with computer facilities. The above reviewed study was conducted in secondary schools where students are grown-ups unlike the current study where majority of learners are children. The current study bridged this gap in literature by carrying out an investigation in early years of education thereby filling gap in literature.

From the reviewed studies, most of them were carried out in contexts that were different from the early childhood level contexts. Moreover, in majority of studies, the approaches used were

either qualitative or quantitative. The present study filled in gaps in literature by focusing on integration of digital technologies in early years of education.

### **3.0: Research Methodology**

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Kothari, 2011). It is a plan, structure and strategy of investigation conceived so as to obtain answers to research questions. The study adopted Concurrent triangulation design within the mixed method approach. The design converges or merges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem. In this design, the investigator typically collects both forms of data at roughly the same time and then integrates the information in the interpretation of the overall results (Creswell, 2014). The study was anchored on Davis (1986) Technology Acceptance Model and Preparedness Theory by Seligman (1971). The study targeted 345 teachers from Kisumu Central Sub-County Kenya. The study adopted saturated sampling to sample preschool, grade one and grade two teachers, stratified random sampling to sample head teachers and grade three teachers. The sample size comprised of 90 preschool teachers, 75 grade one teachers, 75 grade two teachers, 23 grade three teachers and 9 head teachers.

The data collection instruments were structured questionnaires, which generated quantitative data and interview schedules and focus group discussion which sought to elicit in-depth information for qualitative data. Items to measure influence of teachers digital literacy was adapted from digital literacy questionnaire (DLQ) previously used by Kretschmann (2015). It was suitable because it was previously adopted to study digital competency. In using the DLQ for this study, the items from the digital competencies to be studied were rephrased to specifically to align to Kenyan educational context to ensure that the teachers in Early Years of Education understand the survey item and respond appropriately and also to suit early years digital technologies for it was previously used in teacher training colleges. Using the teachers responses based on a five point scales of ; Strongly Agree (5), Agree (4), Undecided (3), Disagree (2) or Strongly Disagree (1), A twelve itemed Likert-scaled questionnaire which explored the teachers' views on the influence of status of digital literacy on integration of digital technologies in early years' education was adopted. The

scale ranged between 1 – 5 with 1 depicting the lowest level of digital technologies integration while 5 indicating the highest of integration of digital technologies. Validity was ensured by expert judgment from university supervisors from Jaramogi Oginga Odinga University of Science and Technology. Cronbach Alpha was used establish reliability and all the subscales met the recommended threshold. Trustworthiness of qualitative data was ensured by use of multiple sources of data. Descriptive statistics, Pearson correlation and linear regression were used to analyze quantitative data. The Qualitative data was analyzed using Thematic Analysis Approach.

#### 4.0: Findings and Discussion

The purpose of the study was to find out the influence of teachers status of digital literacy on integration of digital technologies in early years of education in Kisumu Central Sub-County, Kenya. To establish whether there was any statistical significant influence of status of digital literacy on integration of digital technologies in early years of education, the researcher computed a bivariate Pearson's Product-Moment Coefficient of Correlation between the scores of the two variables. The SPSS output Table 4.4 shows the correlation results.

Table 4.4: *Correlation between Status of Digital Literacy and Integration of Digital Technologies*

		Status of Digital Literacy	Integration of Digital Tech.
Status of Digital Literacy	Pearson Correlation	1	.711**
	Sig. (2-tailed)		.000
	N	202	202
Integration of Digital Technology	Pearson Correlation	.711**	1
	Sig. (2-tailed)	.000	
	N	202	202

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The output indicates a significant ( $n=202$ ;  $r = .711$ ;  $p < 0.05$ ) highly positive correlation between status of digital literacy and integration of digital technologies in preschool and lower primary schools. Therefore, given that the p-value was less than .05, the null hypothesis which stated that “*There is no statistically significant influence of status of digital literacy on integration of digital technologies in preschool and lower primary schools*” was rejected. It is therefore acceptable to

conclude that there is significant positive relationship between status of digital literacy and integration of digital technologies in preschool and lower primary schools, as high status of digital literacy among the teachers is always associated with more integration of digital technologies in teaching. This finding concurs with Kretschmann (2015) in Germany whose study revealed that subjective theories are significantly related to computer literacy and profession experience of the teacher. On contrary, the findings disagree with Olsson & Edman-Stalbrant (2012) in Sweden whose finding indicated that digital literacies within educational programs, has no statistically significant relation with integration of ICT in learning.

Finding of this study was corroborated with qualitative data which was obtained from standard one teachers who participated in the focus group discussion and head teachers who were interviewed. It emerged that most of the study participants held the view that status of digital literacy among the teachers will automatically affect the integration of digital technologies in early years of education. One head teacher remarked;

*“The moment all teachers are made highly literate on issues concerning digital devices, it will become very easy for teachers just to integrate digital technologies into their everyday teaching” .....(HT, 7)*

From the focus group discussion one standard one teacher said;

*“ I can’t say that I am very confident with digital technologies, but am sure that high competency in digital technologies means high level of integration.....(FGD 2)*

This means that both standard one teachers and head teachers believed that teachers with high competency level in digital technologies have high chances of integrating digital technologies in their classroom teachings. However this findings is contrary to Tang Yu, (2014) in Taiwan’s whose finding showed that there was no statistically significant relationship between computer literacy and computer use among pre-service teachers. There was no interconnection between the frequency of using specific computer program and the mastery of the program. On the contrary, the finding agrees with Son & Robb (2012) in Indonesia whose findings revealed that computer literacy is significantly related to teachers’ competency in teaching English language as a foreign language. However to estimate the level of influence of status digital literacy on integration of digital technologies, a coefficient of determination was computed. This was done using regression analysis and the results were presented in Table 4.5.

*Table 4.5: Model Summary on Regression Analysis of Status of Digital Literacy on Integration of Digital Technologies*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.711 <sup>a</sup>	.505	.503	.53548	1.705

a. Predictors: (Constant), Status of Digital Literacy

b. Dependent Variable: Integration of Digital Technology

The model shows that Status of Digital Literacy accounted for 50.5% ( $R^2=.505$ ) of the variation in Integration of Digital Technologies in early years of education in Kisumu Central Sub-County. This was a respectable amount of effect by only one predictor on the dependent variable. However, to determine whether status of digital literacy was a significant predictor of integration of digital technology, Analysis of Variance (ANOVA) was computed as shown in Table 4.6.

Table 4.6: ANOVA –Influence of Status of Digital Literacy on Integration of Digital Technology

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	58.505	1	58.505	204.038	.000 <sup>b</sup>
	Residual	57.347	200	.287		
	Total	115.852	201			

a. Dependent Variable: Integration of Digital Technology

b. Predictors: (Constant), Status of Digital Literacy

The *F*-ratio in the **ANOVA** table (Table 4.6) tests whether the overall regression model is a good fit for the data. The finding of the study reveals that status of digital literacy statistically significantly predict the integration of digital technology,  $F(1, 200) = 204.038, p < .05$  (i.e., the regression model is a good fit of the data). This means that information on the status of digital literacy could be used to significantly predict the integration of digital technology in early years of education. Findings of this study agrees with a number of studies in literature, for instance, Akinnubi, Ozuwehesule&Yisa (2012) in Nigeria study findings showed that there was a significant relationship between computer literacy and teacher job effectiveness. On the same vein in Mauritius, Li-Luen-Ching (2016) study showed a statistically significant positive relationship between the participants and the use of common office soft-ware and were of different level of competencies based on the task listed. Similarly, Sulunga, Toili&Amadalo, (2011) in Kenya indicated in their study that there was a statistically significant positive relationship between related factor and integration of information technology. However, Luwangula (2011) study in Uganda revealed that there is no statistically significant relationship between teachers ICT skills and pedagogical integration of ICT.

In several ways qualitative findings indicated the same findings on status of digital literacy among standard one teachers and head teachers in relation to integration of digital technologies in early years of education. One standard one teachers remarked the following during the focus group discussion;

*“We have tablets for learners, laptops and projectors that were brought by the ministry of education, I can handle all these gadgets at class level, but there is no time for that.....(FGD 3)*



Another one said;

*“Yes, I can handle Microsoft word, Microsoft excel, and power point as these areas are very key when integrating digital technologies in early years of education”.....(FGD 1)*

From excerpts by Participant of FGD 3 and participant of FGD 1, it emerged that teachers poses basic skills of digital literacy which can allow them to integrate digital technologies in early years of education.

Digitally literate teachers are perceived to have technical knowhow on how to integrate digital technologies in their teaching. Like most of head teachers interviewed reiterated that;

*“Digital technologies are good and should be encouraged, the governments should organize for a more formal way of training all teachers whether they are teaching in preschool, lower primary or upper primary so that all of them get exposed to these devices to enable them embrace digital learning at all levels”... (.HT, 6)*

Another head teacher had this say;

*“ But with performance contracting coming in schools, there is a lot of documentation that is needed online, so the digital literacy life is going to be part and parcel of every teachers’ teaching job, so the early we start integrating them the better” .....(HT, 2)*

From the above excerpts, it shows that status of digital literacy among teachers is a strong determinant of how well integration of digital technologies takes place. Teachers who handle digital machines regularly stand a better chance of integrating these technologies into their everyday teaching. This study finding is in agreement with Konan (2012) in Turkey whose study established that Computer literacy level and use of computers by teachers is statistically significant with high teaching experience and also teachers with high level of education. In addition, Son & Robb (2012) in Indonesian supports the finding of this study as their study reported that computer literacy is significantly related to teachers’ competency in integrating digital technologies into foreign language learning. The finding further concurs with Ocaak & Akdemir (2010) in Turkey whose finding demonstrated that improving the use of computer in science seems to increase science achievement, computer use subsequently increased teachers’ integration of computer applications as an instructional tool and the use of computer application in teaching science was found to be

statistically significant to achievement in science. On contrary the finding disagrees with Olsson & Edman-Stalbrant (2012) in Sweden which indicated that digital illiteracies within educational programs, has no statistically significant relation with integration of ICT in learning. Similarly, Luwangula (2011) in Uganda whose study showed that there is no statistically significant relationship between teachers ICT skills and pedagogical integration of ICT.

### **5.0: Conclusion and Recommendation**

The study sought to investigate the influence of teachers' status of digital literacy on integration of digital technologies in early years of education in Kisumu Central Sub-county. The study concluded that most teachers have high status of digital literacy and that there is significant positive influence of status of digital literacy on integration of digital technologies in preschool and lower primary schools. Hence status of digital literacy positively influences integration of digital technologies in early years of education. Based on the findings of the study there are various implications; The Ministry of Education Science and Technology should enhance their supervision on the level of integration of digital technologies in early years of education to ensure that the digital technologies that schools were supplied with are be put into actual use. This is because the study reported that the status of digital literacy is the greatest predictor of integration of digital technologies. Teachers should be encouraged to integrate digital technologies into their teaching since they are sufficiently prepared in terms of their digital literacy and their perception. Digital literacy and teachers' perception have the greatest prediction power integration of digital technologies in early years of education.

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