

# Factors Affecting Implementation of Digital Learning in Primary Schools: A Case of Dagoretti Sub County, Nairobi County

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**Abstract:** The rapid growth in Information Communication and Technologies (ICT) has brought remarkable changes in the twenty-first century. There is a growing demand on educational institutions to use ICT to teach the skills and knowledge. Scholars and policymakers alike have valued the potential of digital technology to revolutionize the education system. However, notwithstanding the exhilaration around technology, the technology may not have the power to change teaching and learning practices. Indeed, intrinsic barriers, such as preexisting teaching beliefs, attitudes toward the educational value of technology, and comfort with technology have been shown to influence the ways in which teachers use technology in the classroom. This study sought to assess the effect of teachers' capacity, resource availability, stakeholder participation and leadership on implementation of digital learning in primary schools in Dagoretti Sub-County. This study was guided by Resource-Based Theory, The Diffusion of Innovation (DOI), social constructivism, and Technology Acceptance Model (TAM). This study employed descriptive survey. The target population was made of the 24 head teachers, 243 upper primary classroom teachers in the 24 public primary schools in Dagoretti Sub-County. From the population the study picked a sample of 24 head teachers, 143 upper primary classroom teachers through random sampling technique. To collect primary data a semi-structured questionnaire with both close ended and open-ended questions were used. Pilot study was done to establish reliability and validity of the research questionnaires. The researcher had the questionnaires filled in and then collected them later through drop and pick later method for the ones personally delivered. The data was then analyzed using descriptive statistics. The Likert scale was used to analyze the mean score and standard deviation. The findings were presented using tables and graphs for further analysis and to facilitate comparison, while explanation to the table and graphs were given in prose. The study revealed that most of the teachers in Dagoretti Sub-County had negative perception and attitude towards the implementation of digital learning, most of the teachers also lacked basic skills and education that could smoothly support the implementation of digital learning, most of the schools lacked adequate resources for the implementation of digital learning, there lacked strong management team to oversee the implementation of digital learning in their schools the stake holder co-operation was below necessitated levels and that there lacked strong measures that would ensure sustained relationship. Stakeholder participation and commitment highly influenced the implementation of digital learning in primary schools. The study concludes that teacher' capacity, stakeholder commitment, leadership and resource availability influenced the implementation of digital learning in primary schools. Study recommends that adequate measures need to be put in place to promote teacher capacities, efforts should be concentrated on training and development, and the state government in collaboration with school management need to ensure allocative efficiency of resources as this was found to be a key crucial factor in digital learning implementation. stake holders who include the government, TSC, parents, donors, school management and pupils must be fully engaging in the implementation process, the role for every stake holder must be clear to avoid conflict in implementation and that the management must adopt the right transformational leadership that will positively propel the (change) implementation of digital learning in primary schools in Dagoretti sub-county.

**Keywords:** Implementation, Digital Learning.

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## 1. BACKGROUND TO THE STUDY

The rapid growth in Information Communication and Technologies (ICT) has brought remarkable changes in the twenty-first century, as well as affected the demands of modern societies. ICT is becoming increasingly important in our daily lives and in our educational system. Therefore, there is a growing demand on educational institutions to use ICT to teach the skills and knowledge. Realizing the effect of ICT on the workplace and everyday life, today's educational institutions try to restructure their educational curricula and classroom facilities, in order to bridge the existing technology gap in teaching and learning. This restructuring process requires effective adoption of technologies into existing environment in order to provide learners with knowledge of specific subject areas, to promote meaningful learning and to enhance professional productivity (Tomei, 2013).

Scholars and policymakers alike have valued the potential of digital technology to revolutionize the education system. Studies done shown that the use of modern technologies considerably influences effective teaching and learning. For example, Benson (2014) did a study in California and established that digital technologies at school learning influence individual and technological factors related to the students' personality while using the modern technologies in educational practice. Similarly, Germany, in Digital technology is seen as; any device or facility that supplies a learner with general electronic information and educational content that aid acquisition of knowledge regardless of location and time (Chen & Kinshuk, 2013).

However, notwithstanding the exhilaration around technology, the technology may not have the power to change teaching and learning practices. Teachers are a powerful mediator of technology's impact on student learning (Neiderhauser & Stoddart, 2011), but there is a lack of evidence that teachers are effectively integrating technology into their classrooms (Keengwe, Onchwari, & Wachira, 2008). The implementation of digital learning in USA was seen to be faced by barriers above and beyond access that prevent teachers from successfully integrating technology into their classroom. Indeed, intrinsic barriers, such as preexisting teaching beliefs, attitudes toward the educational value of technology, and comfort with technology have been shown to influence the ways in which teachers use technology in the classroom (Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2013).

In recent years, the factors that influence the integration of digital learning in classrooms and the ways digital technologies are used in teaching and learning have become central topics in the field of educational technology (Tondeur, Valcke, & Van Braak, 2008; Wastiau, Blamire, Kearney, Quittre, Van de Gaer, & Monseur, 2013). The potential positive impact of digital technology on teaching and learning in schools has been widely acknowledged (Voogt, Knezek, Cox, Knezek, & Brummelhuis, 2013). According to Bilbao-Osorio & Pedró (2011) two types of positive impacts of digital technologies can be identified: (i) the enhancement of the student performance, which includes aspects such as the development of ICT competences and the academic performance in basic subjects, and (ii) the improvement and introduction of new processes of teaching and learning.

A substantial body of research shows that teachers' perceptions of instructional benefits are an influential factor that affects technology integration in classrooms (e.g., Inan & Lowther, 2012; Knezek, Christensen, & Fluke, 2013; Van Braak, Tondeur & Valcke, 2014). Current evidence shows that instructional benefits are defined as the perceived effectiveness of digital technology, which Petko (2012) describes as the belief that student learning is improved with the help of digital media. According to Petko, the element of effectiveness should include items related to whether the use of digital media could improve the quality of teaching, learning outcomes, interest, and creativity, collaborative work and learning strategies for the students.

Technology has changed educational landscape due to how information is delivered and to whom the information is delivered to, the speed of access to information, and the choice of options for learning (Truluck, 2015). In recent years, a concerted effort has been made to introduce modern technologies into the school curriculum these include the use of modern technologies like computers, internet, multimedia, communication technologies as well as the creation of suitable educational software (Chen & Kinshuk, 2011). Studies have shown that the use of digital learning considerably influences effective teaching and learning (Benson, 2014; Hsioung, 2013; Roussos, 2012).

The major advantages of digital technology in education include greater access to appropriate and timely information, reduced cognitive load during learning tasks, and increased interaction with other people and systems. It may be argued that networked mobile devices can help shape a culturally sensitive learning experience that can offer additional and,

possibly, more powerful means of encoding, recall, and transfer (Koole & Ally, 2011). The disadvantage is that not all data, which are available on the web, are suitable for some beginning courses. Students may not have acquired sufficient knowledge of a particular field necessary to use available data sets, although these data sets are suitable for many advanced undergraduate courses.

The mobility of technology describe the ubiquity of the mobile devices such as smartphones, digital cameras, media players, iPods and personal digital assistance devices (PDAs). The mobility of the learners respect the fact that learners are not only remote from their instructors, but they have the full freedom of controlling fully their access of information on their mobile devices, which is done independently. Supporting this view, Uden (2013) opined that mobile technologies offer new opportunities for students' educational activities in that they can be used across different locations and times. The mobility of learning views learning processing from a contextual point of view. "The context is utterly individual – completely different from the rigid outlay of the traditional classroom or lecture room, and the computer laboratory" (El-Hussein & Cronje, 2010)

Across Africa, many countries have started investing considerable amount of money and designing new policies all aimed at making teachers adopt and use ICT in schools. However, there are many challenges some of which could be attributed to the teachers' skills in using ICTs (Zaman et al, 2011). For ICT to be effectively implemented in schools, teachers should be prepared to face challenges that come with its implementation. In Kenya, the government recognizes the positive effect of ICT in making the country a middle level economy has is envisaged in Kenya vision 2030. Effort to implement ICT in schools was first initiated by publishing sessional

Paper No.1 of 2005 where ICT was given prominence. The idea was to equip public secondary schools with ICT infrastructure and integrate it in existing school curriculum in order to meet the challenges of information society. The publication stated that in every school; teacher, student and communities around it should participate in acquiring ICT skills desirable to benefit from knowledge-based economy by year 2015. Learning and teaching in schools was to be transformed to embrace ICT skills appropriate for twenty first century (GOK, 2005).

In Kenya, the policy to guide the use of ICT took very long to complete. Nduati and Bowman (2005) noted that the earliest attempt at ICT policy formulation in Kenya dates back to the 1980s, but the process remained incomplete by 2000. This delay may explain the slowness in adoption of technology in English language teaching and learning. However, the Kenya National ICT policy was adopted in 2006 after several years. Kenya Institute of Curriculum Development (KICD) has been singled out as the sole government body charged with the responsibility of developing the ICT curriculum as well as distributing the educational material. KICD would also be in charge of overseeing other institutions that develop appropriate e-content (Farrell, 2007). Objective number 10 of the MoEST strategic plan (running from 2006 to 2011) targets strengthening the capacity of KICD to execute this mandate among others (Kenya: MoEST, 2006). This is a strong commitment in support of the National ICT policy. In addition, Adikins (2014) notes that in October 2012, Microsoft made a pact with the Kenyan government and Indigo Telecom to supply 2,000 tablets preloaded with educational content to rural Kenyan schools. Further, in 2013, the Kenyan government announced a four-year \$622 million project to provide computing devices to every primary and secondary student in the country. However, this project is yet to be fulfilled in totality.

#### **PROBLEM STATEMENT:**

The use of ICT in the classroom is very important for providing opportunities for students to learn to operate in an information age. Computers began to be placed in schools in the early 1980s, and several researchers suggest that ICT will be an important part of education for the next generation too and that modern technology offers many means of improving teaching and learning in the classroom (Lefebvre, Deaudelin & Loiselle, 2006). Due to ICT's importance in society and possibly in the future of education, identifying the possible obstacles to the integration of these technologies in schools would be an important step in improving the quality of teaching and learning. Balanskat, Blamire, and Kefala (2006) argue that although educators appear to acknowledge the value of ICT in schools, difficulties continue to be encountered during the processes of adopting these technologies. In Kenya, according to Ministry of Education National ICT Strategy for Education and Training policy framework (2006), there are a number of challenges concerning access to and use of ICT in Kenya, including high levels of poverty, limited rural electrification, and frequent power disruptions. Further, it indicates that very few secondary schools have sufficient ICT tools for teachers and students. Kombo (2013) reported that despite the Kenya government's effort and willingness to promote ICT as an

instructional tool, progress on ICT font had fallen short of expectation. The report added that the Ministry of education strategic plan for 2008-2012, identified slow integration of ICT in operations and programs as an area of major weakness in the part of the ministry.

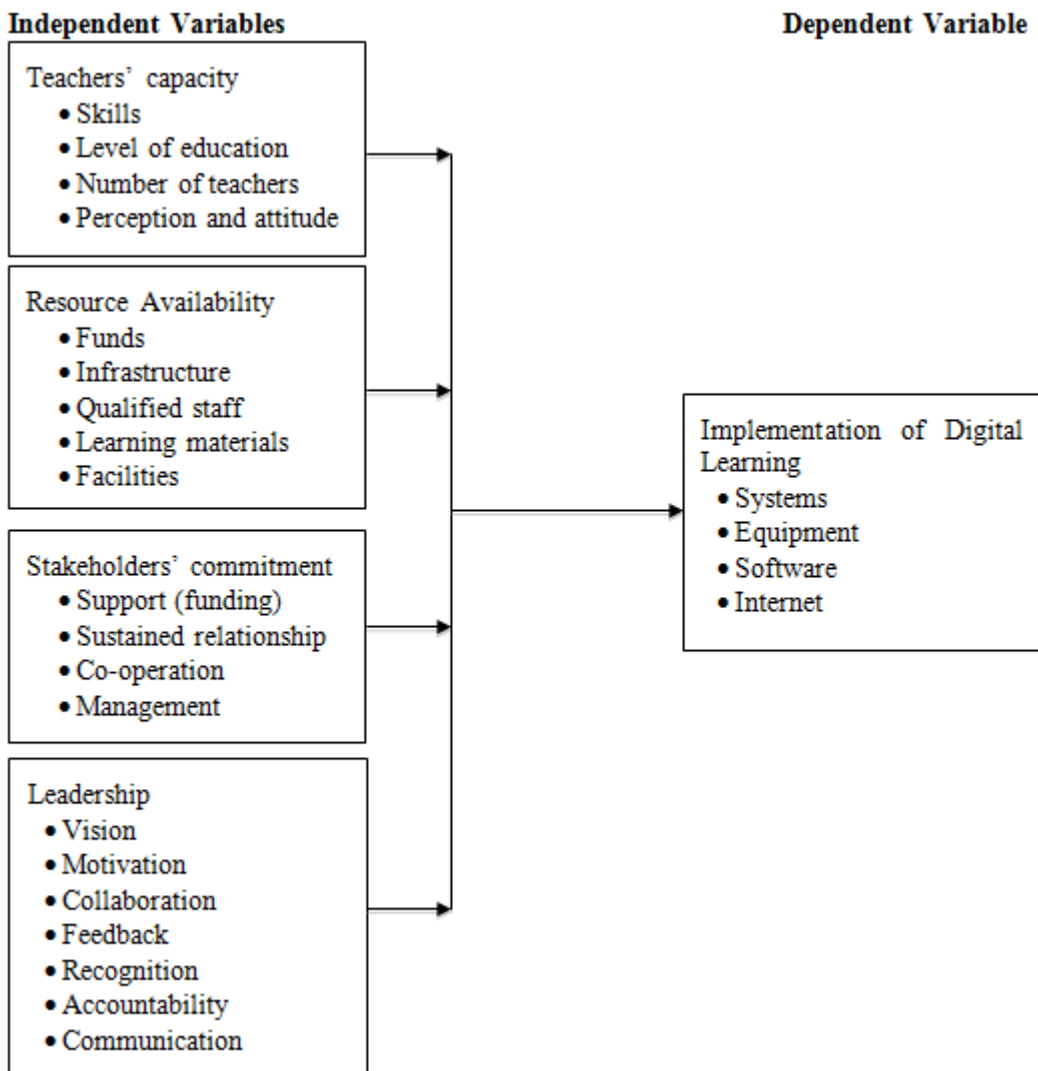
The Kenya Commission for Higher Education (2006) highlights that the integration of technology in teaching is influenced by inadequate expertise for preparing syllabi, developing digital curriculum content and inadequate resources to publish and print. A research by Ouma (2006) suggests there is lack of enough preparation in place for ICT integration in education to succeed. He argues that uptake of ICT in schools requires keen planning, effective teacher preparation and sustained regular teacher professional support and visionary leadership that recognizes the need to prepare the learners to live and work in the technological world of the 21<sup>st</sup>. This preparation is vital and is unfortunately lacking in many of the primary schools.

Studies have been done in relation to implementation of digital learning in schools. Badia, Meneses, Sigalés and Fàbregues (2014) did a study on factors affecting school teachers' perceptions of the instructional benefits of digital technology. Similarly, Benne, Lockyer and Brown (2005) did a study to investigate the factors that influence the use of digital learning resources in the K-12 educational context. Locally, Tarus, Gichoya, and Muumbo (2015) did a study to investigate challenges of implementing e-learning in Kenya targeting Kenyan Public Universities. However, notwithstanding the massive inquiry into areas related to implementation of digital learning in schools, no study local or international, known to the researcher have been done to investigate factors affecting the implementation of digital learning in primary schools in Dagoretti Sub-County. The study therefore sought to bridge the gap of knowledge by assessing the effect of teachers' capacity, resource availability, stakeholder participation and leadership on implementation of digital learning in primary schools in Dagoretti Sub-County.

#### **OBJECTIVES OF THE STUDY:**

- i). To establish the effect of teachers' capacity on implementation of digital learning in primary schools in Dagoretti Sub-County.
- ii). To find out the effect of resource availability on implementation of digital learning in primary schools in Dagoretti Sub-County.
- iii). To establish the effect of stakeholder participation on implementation of digital learning in primary schools in Dagoretti Sub-County.
- iv). To find out the effect of leadership on implementation of digital learning in primary schools in Dagoretti Sub-County.

## 2. CONCEPTUAL FRAMEWORK



## 3. RESEARCH METHODOLOGY

According to Mugenda and Mugenda (2003), research methodology refers to the systems, methods and techniques used by a researcher in collecting data to define research problem. This chapter therefore presents the research design, population, sample size, sampling technique, nature of data to be used by the study, data collection tools, pretesting of research instruments, data collection procedure, measurement and analysis.

### Research Design:

Kombo and Tromp (2006) define research design as the scheme outline or plan that is used to generate answers to research to research problems. This study employed descriptive survey. A descriptive study attempts to describe or define a subject, often by creating a profile of a group of problems, people, or events, through the collection of data and tabulation of the frequencies on research variables or their interaction as indicated by Cooper and Schindler (2003). Descriptive research is more rigid than an exploratory research and seeks to describe uses of a product, determine the proportion of the population that uses a product, or predict future demand for a product. Kombo and Tromp (2006) notes that the choice of descriptive survey research design is made in a study when the research is interested on the state of affairs already existing in the field and no variable would be manipulated. This study aimed to establish the state of affairs in digital learning implementation in Dagoretti Sub-County. It focused on determining factors affecting implementation of digital learning in primary schools.

**Target Population:**

According to Ngechu (2004), a population is a well-defined or set of people, services, elements, events, group of things that are being investigated. Further, Jacobsen, (2002) indicated that population is the whole group that the research focuses on. The study targeted head teachers, upper primary classroom teachers. The head teacher and classroom teachers were sourced from the 24 public primary schools in Dagoretti Sub-County (see appendix I).

**Study Population**

Category	Population	Proportion (%)
Head Teachers	24	9
Classroom Teachers	243	91
Total	267	100

Source: Ministry of Education science and Technology

**Sampling procedure and Sample Size:**

According to Alan Bryman (2012), sampling frame describes the selection of the units from which the sample is selected. Kombo and Tromp (2013) indicated that a sample is a finite part of a statistical population whose properties are studied to gain information about the whole. From the population 116, the study picked a sample through random sampling technique. According to Cooper and Schindler (2003), random sampling frequently minimizes the sampling error in the population. In random sampling, each item or element of the population has an equal chance of being chosen at each draw. While the study targeted head teachers, upper primary classroom teachers, census was done for the head teachers and of a sample of upper primary classroom teachers was taken. To determine the sample size of the upper primary classroom teachers, the researcher used formula by Saunders, Lewis, and Thornhill (2012) for sample size determination (See Appendix II for sample size determination table).

$$n = \frac{\chi^2 NP (1-P)}{\sigma^2 (N - 1) + \chi^2 P (1 - P)}$$

Where:

n = required sample size

$\sigma^2$  = the degree of accuracy;  $\sigma$  value is 0.05

N = the given population size from the sampling frame

$\chi^2$  = Table value of chi-square for one degree of freedom, which is 3.841

P = Population proportion, assumed to be 0.50

The sample size for the classroom teachers was 143 and for the head teacher was 24. Therefore, the total sample was 167. The sampled respondents are deemed knowledgeable on subject matter and therefore, they were in a better position to provide credible information as sought by the study.

**Study Sample**

Category	Population	Sample
Head Teachers	24	24
Classroom Teachers	243	143
Total	267	167

**Data Collection Procedures:**

The researcher collected both qualitative and quantitative data using a self-administered questionnaire. The researcher informed the respondents that the instruments being administered are for research purpose only and the responses from the respondents were kept secret and confidential. The researchers had the questionnaires filled in and then collect later through drop and pick later method for the ones personally delivered.



**Description of Data Collection Instrument:**

Mugenda and Mugenda (2003) defines data collection instrument as a device used in research for measuring a given phenomenon or concept of interest. Mugenda and Mugenda noted that an ideal instrument results to pertinent, precise, unbiased, subtle and efficient measures. To collect primary data a semi-structured questionnaire and The open-ended questions provided additional information that may not have been captured in the close-ended questions.

**Pilot Testing:**

The pilot study allowed for pre-testing of the research instrument. The clarity of the instrument items to the respondents was established so as to enhance the instrument's validity and reliability

**Data Analysis and Presentation:**

The researcher edited completed questionnaires for completeness and consistency. Data clean-up followed; this process involves editing, coding, and tabulation in order to detect any anomalies in the responses and assign specific numerical values to the responses for further analysis. The data was then analyzed using descriptive statistics. The descriptive statistical tools (SPSS and Excel) helped the researcher to describe the data. The Likert scale was used to analyze the mean score and standard deviation. The findings were presented using tables and graphs for further analysis and to facilitate comparison, while explanation to the table and graphs was given in prose.

**4. DATA ANALYSIS, INTERPRETATIONS AND PRESENTATION****Response rate**

	<b>Questionnaires Administered</b>	<b>Questionnaires filled &amp; Returned</b>	<b>Percentage</b>
Respondents	167	146	87.4

The study targeted a sample size of 167 respondents from which 146 filled in and returned the questionnaires making a response rate of 87.4%.

**Reliability Analysis**

Variable	Cronbach Alpha coefficient score	No. Of Items	Comments
Teacher's capacity	0.889	9	Reliable
Resource availability	0.830	8	Reliable
Stakeholder commitment	0.905	9	Reliable
Leadership	0.832	8	Reliable

Gliem and Gliem (2003) established the Alpha value threshold at 0.7, thus forming the study's benchmark. Cronbach alpha was established for every objective which formed a scale. The Table shows that stakeholder commitment had the highest reliability ( $\alpha=0.905$ ), followed by teacher's capacity ( $\alpha=0.889$ ), leadership ( $\alpha=0.832$ ) and resource availability ( $\alpha=0.830$ ) this illustrates that all the variables were reliable as their reliability values exceeded the prescribed threshold of 0.7.

**General Information:****Gender Distribution:**

Respondents were requested to indicate their gender category. This was sought in view of ensuring equity in gender involvement. Results on gender distribution are analyzed

<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Male	59	40.4
Female	87	59.6
<b>Total</b>	<b>146</b>	<b>100</b>

Results obtained show that majority of the respondents (59.6%) were females whereas 40.4% were males. The findings show fair engagement of male and female respondents implying that the findings didn't form gender biasness.

#### Age Category:

Various age groups hold different opinion on various subjects. To ensure that all the opinions were well encompassed, respondents were requested to indicate their age group. Results are analyzed in below

**Distribution of respondents by Age**

Age category	Frequency	Percentage
26 to35 years	22	15.1
36 to 45 years	37	25.3
46 to 55 years	56	38.4
56 years and above	31	21.2
<b>Total</b>	<b>146</b>	<b>100</b>

**Period of Service**

Periods Of Service	Frequency	Percentage
Less than 12 months	10	6.8
1 to 3 years	16	11.0
4 to 7 years	44	30.1
8 to 12 years	76	52.1
<b>Total</b>	<b>146</b>	<b>100</b>

#### Teachers Capacity:

This section investigates the relationship between teacher's capacity affects implementation of digital learning in schools.

#### Effect of Teacher's Capacity on Implementation of Digital Learning:

The research sought to determine whether teacher's capacity affects the implementation of digital learning.

**Effect of Teacher's Capacity on Implementation of Digital Learning**

Opinion	Frequency	Percentage
Yes	106	72.6
No	40	27.4
<b>Total</b>	<b>146</b>	<b>100</b>

From the analysis, majority of the participants as shown by 72.6% agreed that teacher's capacity affected the implementation of digital learning while 27.4% of the respondents were of the contrary opinion. This implies that teacher's capacity affects the implementation of digital learning in schools.

#### Extent to which Teacher's Capacity influenced the Implementation of Digital Learning:

The study sought to determine the extent to which teacher's capacity affected the implementation of digital learning.

**Extent to which teacher's capacity influenced the implementation of digital learning**

Extent	Frequency	Percentage
Very great extent	46	31.5
Great extent	55	37.7
Moderate extent	33	22.6
Low extent	12	8.2
<b>Total</b>	<b>146</b>	<b>100</b>

From the analysis, most of the respondents (37.7%) indicated to a great extent, 31.5% indicated to a very great extent, 22.6% indicated to a moderate great extent, whereas 8.2% indicated to a low extent. This implies teacher's capacity affected the implementation of digital learning to a great extent.



**Statements Assessing Effect of Teachers' Capacity on Implementation of Digital Learning:**

In order to establish the extent to teachers' capacity and implementation of digital learning, the study asked the respondents indicate their rating with regard to the following statements. The respondents were provided with a scale of 1 to 5 where 5= strongly agree, 4= Agree, 3 = Neutral, 2= Disagree and 1= Strongly Disagree. Table 4.8 below tabulates the study findings

**Effect of teachers' capacity on implementation of digital learning**

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std deviation
Lack of awareness among teachers of the potential offered by computers in the education context affects implementation of digital learning	10%	15%	24%	38%	13%	3.87	0.12
Teachers' beliefs and attitudes are important determinants and predictors of teaching practices in digital learning	6%	12%	17%	41%	24%	3.64	1.14
Teachers must be both competent and confident in their teaching ability enhance digital learning	15%	14%	10%	35%	26%	4.42	0.25
Implementation of digital learning is influenced by level of skilled staff	5%	9%	22%	44%	20%	3.98	0.21
Teachers' adequacy influence successful implementation of digital learning in schools	3%	8%	13%	54%	22%	4.33	.014

From the analysis, majority of the respondents agreed that; teachers must be both competent and confident in their teaching ability enhance digital learning (mean = 4.45, std deviation = 0.25) and that teachers' adequacy influence successful implementation of digital learning in schools (mean = 4.33, std deviation = 0.014). The findings concurs with the research by Forlin (2016) that teachers must have the necessary skills to develop and adapt curricula to meet individual needs.

The study also revealed that implementation of digital learning is influenced by level of skilled staff, (mean = 3.98, std deviation = 0.21), lack of awareness among teachers of the potential offered by computers in the education context affects implementation of digital learning (mean = 3.87, std deviation = 0.12) and teachers' beliefs and attitudes are important determinants and predictors of teaching practices in digital learning (mean = 3.64, std deviation = 1.14) The findings are in line with the research by Brownell and Pajars (2003) who emphasize that teachers' beliefs are important determinants and predictors of teaching practices in digital learning.

Respondents were requested to rate the following aspects of teachers' capacity in relation to implementation of digital learning in their schools. Results are analyzed

**Teachers' Capacity**

Teachers' Capacity	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std deviation
Skills	6%	14%	16%	41%	33%	4.10	1.05
Level of education	8%	12%	24%	40%	26%	4.00	1.25
Number of teachers	4%	3%	27%	48%	18%	3.78	0.25
Perception and attitude	6%	7%	22%	50%	15%	4.36	0.15

From the analysis, majority of the respondents agreed that the following aspects of teachers' capacity important in implementation of digital learning; perception and attitude (mean = 4.36, std deviation = 0.15), skills (mean = 4.10), level of education (mean = 4.00) and number of teachers (mean = 3.78) the findings concurs with the research by Riddell et al., (2016) that effective implementation of digital learning is influenced by level of skilled staff, indicated that training is very practical and includes knowledge about teaching techniques, curricular adaptations, knowledge about particular technology and specific techniques

#### Resource Availability:

#### Extent to which Resource Availability influenced the Implementation of Digital Learning:

The study sought to determine the extent to which resource availability affected the implementation of digital learning. Results are analyzed

#### Extent to which resource availability influenced the implementation of digital learning

Extent	Frequency	Percentage
Very great extent	50	34.2
Great extent	63	43.2
Moderate extent	18	12.3
Low extent	15	10.3
<b>Total</b>	<b>146</b>	<b>100</b>

From the analysis, most of the respondents (43.2%) indicated to a great extent 34.2% indicated to a very great extent, 12.3% indicated to a moderate great extent, while 10.3% indicated to a low extent. this implies resource availability affected the implementation of digital learning to a great extent.

#### Extent to which Resource Availability and Implementation of Digital Learning

#### Resource Availability and Implementation of Digital Learning

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std deviation
Major constraint of the move toward digital learning in education is attributed mainly to inadequate facilities in schools	10%	6%	10%	47%	27%	4.30	0.21
Lack of relevant facilities and materials is a major challenge to the implementation of effective digital learning	5%	4%	12%	33%	46%	3.77	0.31
Inadequate financial resources have slowed implementation of digital learning in schools	6%	8%	13%	57%	16%	3.56	0.44
Effective implementation of digital learning is influenced by level of skilled staff	3%	6%	17%	44%	30%	4.03	0.15

From the analysis, majority of the respondents agreed that; major constraint of the move toward digital learning in education is attributed mainly to inadequate facilities in schools (mean = 4.30, std deviation = 0.21) and that effective implementation of digital learning is influenced by level of skilled staff (mean = 4.03, std deviation = 0.15). The findings concurs with the research by resource based view theory that strong resource capabilities are prerequisite successful implementation projects across organisations (Ray, Muhammad & Barney, 2005).

The study also revealed that lack of relevant facilities and materials is a major challenge to the implementation of effective digital learning (mean = 3.77, std deviation = 0.31) and inadequate financial resources have slowed implementation of digital learning in schools (mean = 3.56, std deviation = 0.44). The findings are in line with the research by Tirusew (2012) the idea of digital learning is marred by various challenges, in particular rising costs, concerns over efficiency and equity in the use of resources.

Respondents were requested to rate the adequacy of the following aspects of resource availability in relation to implementation of digital learning in their schools.

Resource Availability	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std deviation
Funds	38%	37%	9%	5%	11%	2.01	0.25
Infrastructure	37%	44%	13%	4%	2%	1.36	0.11
Qualified staff	39%	36%	11%	2%	12%	1.37	0.22
Learning materials	46%	34%	16%	4%	0%	1.85	0.38
Facilities	26%	47%	12	4%	11%	1.66	0.14

From the analysis, majority of the respondents disagreed that the school had adequate Infrastructure for implementation of ICT (mean = 1.36), the study also noted that most school lacked qualified staff (mean =1.37), there also lacked the necessary facilities (mean =1.66), learning materials (mean = 1.85) and funds (mean =2.01) the findings concurs with the research by Etenesh (2010) suggests that the lack of relevant facilities and materials is a major challenge to the implementation of effective digital learning in many places

### Stakeholders 'Commitment:

#### Effect of Stakeholders' Commitment on Implementation of Digital Learning:

The research sought to determine whether teacher's capacity affects implementation of digital learning. Results are analyzed.

#### Effect of stakeholders' commitment on Implementation of Digital Learning

Opinion	Frequency	Percentage
Yes	132	90.4
No	14	9.6
<b>Total</b>	<b>146</b>	<b>100</b>

From the analysis, majority of the participants as shown by 90.4% agreed that teacher's capacity affected the implementation of digital learning while 9.6% were of the contrary opinion. This implies that stakeholders' commitment affects the implementation of digital learning in schools.

#### Extent to which stakeholders' commitment influenced the implementation of digital learning

Extent	Frequency	Percentage
Very great extent	51	34.9
Great extent	55	37.7
Moderate extent	27	18.5
Low extent	13	8.9
<b>Total</b>	<b>146</b>	<b>100</b>

From the analysis, most of the respondents (37.7%) indicated to a great extent, 34.9% indicated to a very great extent, 18.5% indicated to a moderate great extent whereas 8.9% indicated to a low extent. This implies stakeholders' commitment affected the implementation of digital learning to a great extent

#### Stakeholders' Commitment and Implementation of Digital Learning:

The study determine the extent to which respondents agreed with the following sub measures of assessing the influence of Stakeholders' commitment on implementation of digital learning. Results are analyzed

#### Stakeholders' commitment and implementation of digital learning

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std deviation
Stakeholder participation and commitment is crucial to successful digital learning implement	3%	9%	15%	47%	26%	4.32	0.12
Stakeholders commitment allows for provide consistent and transparent information to all	8%	4%	13%	38%	37%	3.62	0.27
Stakeholders commitment ensures ease in decision	7%	5%	18%	42%	28%	3.87	0.36

making and therefore allows supports digital learning implementation							
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From the analysis, majority of the respondents agreed that; stakeholder participation and commitment is crucial to successful digital learning implement (mean = 4.32, std deviation = 0.12), stakeholders commitment ensures ease in decision making and therefore allows supports digital learning implementation (mean = 3.87, std deviation =0.36) and that stakeholders commitment allows for provide consistent and transparent information to all (mean = 3.62, std deviation =0.27). The findings are in line with the research by (Ahmed & Palermo, 2010). Ideally, a good stakeholder participation program will enable those who are interested in, or affected by a decision, have an opportunity to influence the outcome. Stakeholders play role and interact at multiple levels-from local to global level and their role and interaction determine the effectiveness of a development intervention.

Respondents were requested to rate the rate the following aspects of stakeholders' commitment in school in relation to implementation of digital learning in their schools. Results are analyzed

#### Stakeholders' commitment and implementation of digital learning

Stakeholders' Commitment	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std deviation
Support (funding)	34%	55%	5%	6%	0%	1.87	0.36
Sustained relationship	48%	18%	17%	8%	9%	2.08	0.21
Co-operation	36%	46%	12%	3%	3%	1.95	0.38
Management	46%	29%	13%	9%	3%	1.88	0.22

From the analysis, majority of the respondents disagreed that; there was strong support in terms of funding to support the implementation of digital learning in their schools (mean value = 1.87), there lacked strong management team to oversee the implementation of digital learning in their schools (mean value = 1.88), the study also noted that co-operation was below necessitated levels (mean value = 1.95) and that there wasn't strong measures that would ensure sustained relationship (mean value = 2.08). the findings concurs with the research by Jansky & Uitto, (2015) Savage et al. (2014) argues that stakeholders are vital sources of information and should always be encouraged to participate in a process, even where they are fundamentally opposed to it.

#### Leadership:

#### Extent to which leadership influenced the Implementation of Digital Learning:

The study sought to determine the extent to which leadership affected the implementation of digital learning. Results are analyzed

#### Extent to which leadership influenced the implementation of digital learning

Extent	Frequency	Percentage
Very great extent	58	39.7
Great extent	60	41.1
Moderate extent	28	19.2
<b>Total</b>	<b>146</b>	<b>100</b>

From the analysis, most of the respondents (41.1%) indicated to a great extent, 39.7% indicated to a very great extent while 19.2% indicated to a moderate extent. this implies leadership affected the implementation of digital learning to a great extent.

#### Influenced of Leadership on Implementation of Digital Learning:

The study determine the extent to which respondents agreed with the following sub measures of assessing the influence of leadership on implementation of digital learning. Results are analysed

**Leadership and Implementation of Digital Learning**

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Deviation
Leadership sets up the direction (strategic planning) necessary for implementation of digital learning	6%	5%	8%	47%	34%	4.36	0.39
Leadership for an digital learning system should be evidence-driven, focused on student outcomes, and based on a recognition that success comes from individuals working together	7%	12%	18%	18%	45%	3.98	0.28
Leaders provide and sell a vision in support implementation of digital learning	4%	7%	13%	37%	39%	3.63	0.47
Leadership advocate for adequate resources to be brought into the school o support implementation of digital learning	3%	4%	17%	30%	46%	3.87	0.25

From the analysis, majority of the respondents agreed that; leadership sets up the direction (strategic planning) necessary for implementation of digital learning (mean = 4.36) and that leadership for an digital learning system should be evidence-driven, focused on student outcomes, and based on a recognition that success comes from individuals working together (mean = 3.98, std deviation = 0.28) The findings are in line with the research by Krause (2015) leadership commitments has a significant factor in determining teachers' attitude towards digital learning, as the teacher feels reaffirmed if the school principal fosters a positive learning environment for both teachers and students.

The study also revealed that leadership advocate for adequate resources to be brought into the school o support implementation of digital learning (mean = 3.87, std deviation = 0.25) and that leaders provide and sell a vision in support implementation of digital learning (mean = 3.63, std deviation = 0.47). The findings concur with the research by Larrivee & Cook, (2013) that digital learning success depends majorly on effectiveness of leadership.

Respondents were requested to rate the rate the following aspects of leadership in school in relation to implementation of digital learning in their schools. Results are analyzed **Leadership and Implementation of Digital Learning**

Leadership	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std deviation
Provision of vision	8%	10%	12%	34%	36%	3.89	1.36
Provision of motivation	33%	37%	12%	14%	4%	1.97	1.20
Provision of collaboration	1%	5%	14%	48%	32%	3.45	1.36
Provision of feedback	5%	6%	49%	29%	11%	3.20	0.36
Provision of recognition	33%	34%	12%	13%	8%	1.66%	0.47
Provision of accountability	38%	44%	13%	4%	1%	1.78%	0.22
Provision of communication	32%	36%	16%	12%	4%	1.99%	0.36

From the analysis, majority of the respondents disagree that school management adequately provided adequate recognition (mean = 1.66), accountability (mean = 1.78), there lacked strong motivation measures (mean = 1.97) and that there lacked strong institutional communication measures (mean =1.99) the findings contradicts the research by

(Shaddock et al., 2009), leadership for a digital learning system should be evidence-driven, focused on student outcomes, and based on a recognition that success comes from individuals working together.

The study also revealed that most schools had clear vision on digital learning implementation (mean = 3.89), moderate levels of collaboration in implementation of digital learning (mean, 3.45) and feedback (mean =3.20). The findings are in line with the research by Mitchell (2008), developing a school culture for digital learning requires the exercise of leadership, particularly by the principal and also others in a school.

#### Regression Analysis:

Regression analysis shows how dependent variable is influenced with independent variables.

#### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.809	0.655	0.641	0.122

#### ANOVA results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.04	4	0.76	49.293	0.000
	Residual	2.115	141	0.015		
	Total	5.155	145			

The probability value of 0.000 indicates that the regression relationship was highly significant in predicting how teacher's capacity, resource availability, stakeholder commitment and leadership affected the implementation of digital learning in primary schools in Dagoretti Sub-County. The F calculated at 5 percent level of significance was 49.293 since F calculated is greater than the F critical (value = 2.4495), this shows that the overall model was significant.

#### Coefficients of Determination

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.987	0.143		6.902	.0000
	Teacher's capacity X1	0.722	0.196	0.678	3.684	.0003
	Resource availability X2	0.663	0.113	0.634	5.867	.0000
	Stakeholder commitment X3	0.873	0.148	0.786	5.899	.0000
	Leadership X4	0.511	0.162	0.498	3.154	.0023

The established model for the study was:

$$Y = 0.987 + 0.722 X_1 + 0.663 X_2 + 0.873 X_3 + 0.511 X_4$$

The regression equation above has established that taking all factors into account (teacher's capacity, resource availability, stakeholder commitment and leadership) to constant at zero, the implementation of digital learning in primary schools in Dagoretti Sub-County will stand at 0.987. The findings presented also show that a unit enhancement in teacher's capacity would positively promote the implementation of digital learning in primary schools in Dagoretti sub-county by a factor of 0.722, a unit increase in resource availability would promote the implementation of digital learning in primary schools by a factor of 0.663, further, the findings shows that a unit increases in stakeholder commitment would promote the implementation of digital learning in primary schools in Dagoretti sub-county by a factor of 0.873 and that a unit increase leadership would lead to a 0.511 increase in implementation of digital learning in primary schools in Dagoretti sub-county by a factor..

## 5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Teachers Capacity and Implementation of Digital Learning:

The study investigated the relationship between teacher's capacity affects implementation of digital learning in schools. Evidence obtained from inferential statistic predicts that a unit enhancement on teacher's capacity would positively



promote the implementation of digital learning in primary schools in Dagoretti sub-county by a factor of 0.722. Descriptive results also confirm that teacher's capacity affected the implementation of digital learning to a great extent. The findings are in line with the research by Brownell and Pajars (2003) both emphasize that teachers' beliefs are important determinants and predictors of teaching practices in digital learning. Teachers must be both competent and confident in their digital teaching ability.

Results further show that teachers must be both competent and confident in their teaching ability enhance digital learning (mean = 4.45) and that teachers' adequacy influence successful implementation of digital learning in schools (mean = 4.33). The findings concurs with the research by Forlin (2016) that teachers must have the necessary skills to develop and adapt curricula to meet individual needs.

The study also revealed that implementation of digital learning is influenced by level of skilled staff, (mean = 3.98), lack of awareness among teachers of the potential offered by computers in the education context affects implementation of digital learning (mean = 3.87) and teachers' beliefs and attitudes are important determinants and predictors of teaching practices in digital learning (mean = 3.64) The findings are in line with the research by Brownell and Pajars (2003) who emphasize that teachers' beliefs are important determinants and predictors of teaching practices in digital learning.

The study also noted that the following aspects of teachers' capacity were important in implementation of digital learning; perception and attitude (mean = 4.36), skills (mean = 4.10), level of education (mean = 4.00) and number of teachers (mean = 3.78) the findings concurs with the research by Riddell et al., (2016) that effective implementation of digital learning is influenced by level of skilled staff, indicated that training is very practical and includes knowledge about teaching techniques, curricular adaptations, knowledge about particular technology and specific techniques

#### **Resource Availability and Implementation of Digital Learning:**

The study investigated the influence of resource availability on the implementation of digital learning. Results obtained from the regression model predict that a unit increase in resource availability would promote the implementation of digital learning in primary schools by a factor of 0.663. Descriptive results also re-affirm that resource availability affected the implementation of digital learning to a great extent. The findings are in line with the research by Tirusew (2012) that resources are vital in the implementations of digital learning programs.

The findings also indicated that one of the major constraint toward the he move to implement digital learning in education is attributed mainly to inadequate facilities in schools (mean = 4.30,) and that effective implementation of digital learning is influenced by level of skilled staff (mean = 4.03, std deviation = 0.15). The findings concurs with the research by resource based view theory that strong resource capabilities are prerequisite successful implementation projects across organisations (Ray, Muhammad & Barney, 2005).

The study also revealed that lack of relevant facilities and materials is a major challenge to the implementation of effective digital learning (mean = 3.77) and inadequate financial resources have slowed implementation of digital learning in schools (mean = 3.56). The findings are in line with the research by Tirusew (2012) the idea of digital learning is marred by various challenges, in particular rising costs, concerns over efficiency and equity in the use of resources.

The research further noted that the school had adequate Infrastructure for implementation of ICT (mean = 1.36), the study also noted that most school lacked qualified staff (mean =1.37), there also lacked the necessary facilities (mean =1.66), learning materials (mean = 1.85) and funds (mean =2.01) the findings concurs with the research by Etenesh (2010) suggests that the lack of relevant facilities and materials is a major challenge to the implementation of effective digital learning in many places.

#### **Stakeholders' Commitment and Implementation of Digital Learning:**

The research findings revealed that stakeholders' commitment affected the implementation of digital learning to a great extent. Regression test predict that a unit increases in stakeholder commitment would promote the implementation of digital learning in primary schools in Dagoretti sub-county by a factor of 0.873. Descriptive reveal that stakeholder participation and commitment is crucial to successful digital learning implement (mean = 4.32), stakeholders commitment ensures ease in decision making and therefore allows supports digital learning implementation (mean = 3.87) and that stakeholders commitment allows for provide consistent and transparent information to all (mean = 3.62). The findings are in line with the research by (Ahmed & Palermo, 2010). Ideally, a good stakeholder participation program will enable

those who are interested in, or affected by a decision, have an opportunity to influence the outcome. Stakeholders play role and interact at multiple levels—from local to global level and their role and interaction determine the effectiveness of a development intervention.

The study also noted that disagreed that; there lacked strong support in terms of funding to support the implementation of digital learning in their schools (mean value = 1.87), there lacked strong management team to oversee the implementation of digital learning in their schools (mean value = 1.88), the study also noted that co-operation was below necessitated levels (mean value = 1.95) and that there wasn't strong measures that would ensure sustained relationship (mean value = 2.08). the findings concurs with the research by Jansky & Uitto, (2015) Savage et al. (2014) argues that stakeholders are vital sources of information and should always be encouraged to participate in a process, even where they are fundamentally opposed to it.

### **Leadership and Implementation of Digital Learning:**

The study investigated the extent to which leadership influenced the implementation of digital learning. Prediction results predict that a unit increase leadership would lead to a 0.511 increase in implementation of digital learning in primary schools in Dagoretti sub-county. the study also noted that leadership sets up the direction (strategic planning) necessary for implementation of digital learning (mean = 4.36) and that leadership for an digital learning system should be evidence-driven, focused on student outcomes, and based on a recognition that success comes from individuals working together (mean = 3.98) The findings are in line with the research by Krause (2015) leadership commitments has a significant factor in determining teachers' attitude towards digital learning, as the teacher feels reaffirmed if the school principal fosters a positive learning environment for both teachers and students.

The study also revealed that leadership advocate for adequate resources to be brought into the school o support implementation of digital learning (mean = 3.87) and that leaders provide and sell a vision in support implementation of digital learning (mean = 3.63). The findings concur with the research by Larrivee & Cook, (2013) that Digital learning success depends majorly on effectiveness of leadership.

The study also noted that school the management never provided adequate recognition (mean = 1.66), accountability, there lacked strong motivation measures (mean = 1.97) and that there lacked strong institutional communication measures (mean =1.99) The findings contradicts the research by (Shaddock et al., 2009), leadership for a digital learning system should be evidence-driven, focused on student outcomes, and based on a recognition that success comes from individuals working together

The study also revealed that most schools had clear vision on digital learning implementation (Mean = 3.89), moderate levels of collaboration in implementation of digital learning (Mean, 3.45) and feedback (Mean =3.20). The findings are in line with the research by Mitchell (2008), developing a school culture for digital learning requires the exercise of leadership, particularly by the principal and also others in a school.

### **CONCLUSIONS:**

To establish the effect of teachers' capacity on implementation of digital learning in primary schools in Dagoretti Sub-County.

Based on the research findings, the study concludes that implementation of digital learning in primary schools in Dagoretti Sub-County was highly hampered by insufficiency in teachers' capacity. The sub measures assessing teacher capacity evidenced that most of the teachers in Dagoretti Sub-County had negative perception and attitude towards the implementation of digital learning, most of the teachers also lacked basic skills and education that could smoothly support the implementation of digital learning and that limited numbers of teachers in most of primary school was also revealed as a major hindrance in the implementation of digital learning.

To find out the effect of resource availability on implementation of digital learning in primary schools in Dagoretti Sub-County.

As per the second objective, the study concludes that resource availability was vital factor in implementation of digital learning in primary schools in Dagoretti Sub-County, however as per the results, its noTable that most of the schools in the grate Sub-County lacked adequate resources for the implementation of digital learning. Among the resource

insufficiencies noted included; infrastructural in adequacy, lack of qualified personnel, lack of necessary facilities like hardware, software, learning materials and funds.

To establish the effect of stakeholder participation on implementation of digital learning in primary schools in Dagoretti Sub-County.

The study concludes that stakeholder participation highly influenced the implementation of digital learning in primary schools in Dagoretti Sub-County. However the study noted that stakeholder participation and commitment was not up to the required levels something that crippled the implementation of digital learning in primary schools. The study concluded that there lacked strong management team to oversee the implementation of digital learning in their schools the stake holder co-operation was below necessitated levels and that there lacked strong measures that would ensure sustained relationship.

To find out the effect of leadership on implementation of digital learning in primary schools in Dagoretti Sub-County.

The study concluded that strong directive leadership could properly steere the implementation of digital learning in primary schools in Dagoretti Sub-County, however the study noted that most schools in Dagoretti lacked strong management team that could provide clear vision on digital learning implementation, and that current leadership only provided moderate levels of collaboration in implementation of digital learning.

### **RECOMMENDATIONS:**

Based on the study observations the study makes the following recommendations.

Adequate measures need to be put in place to promote teacher capacities. Efforts should be concentrated on training and development.

There government in collaboration with school management need to ensure allocative efficiency of resources as this was found to be a key crucial factor in digital learning implementation.

Stake holders who include the government, TSC, parents, donors, school management and pupils must be fully engaging in the implementation process. The r role for every stake holder must be clear to avoid conflict in implementation.

The management must adopt the right transformational leadership that will positively propel the (change) implementation of digital learning in primary schools in Dagoretti Sub-County.

### **FURTHER AREAS OF RESEARCH:**

The study sought to establish factors affecting implementation of digital learning in primary schools in Dagoretti Sub-County. The study variables i.e. Teacher's capacity, resource availability, stakeholder commitment and leadership explained 64.1% variations in implementation of digital learning in primary schools in Dagoretti Sub-County thus the thus other variables accounting for 35.9% percent need to be establish and their effect assessed as well.

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