



An Investigation into Availability of ICT Infrastructure and Adequacy of ICT Technical Personnel for Implementation of Digital Literacy Programme in Public Primary Schools in Waitaluk Division, Trans-Nzoia County, Kenya

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***Abstract:** The government of Kenya has been pushing for digital instruction content delivery in primary schools through implementation of the Digital Literacy Programme. However this programme has not been fully implemented in public primary schools in Kenya due to inadequate ICT infrastructure and personnel. The study sought to investigate schools' preparedness towards implementation of the Digital Literacy programme in Waitaluk division, Trans-Nzoia County, Kenya. The study was guided by the following objectives: to establish the availability of ICT infrastructure in public primary schools in Waitaluk division for implementation of Digital Literacy Programme and to examine whether public primary schools in Waitaluk division have adequate ICT technical personnel for implementation of Digital Literacy Programme. Descriptive survey research design approach was utilized. The target population was 329 teachers and pupils' representatives drawn from 17 public primary schools within Waitaluk division. The sample size was based on 30% of the 17 schools in Waitaluk division sampled through simple random sampling. This resulted to 5 schools. 5 Head teachers out of 17 head teachers were sampled using purposive sampling and 35 regular teachers out of 278 teachers. 30% (10) of pupils out of 34 pupils' representatives were sampled using purposive sampling. Information was collected using questionnaires and observation checklists. Data was analyzed using descriptive and inferential statistics through the help of SPSS version 22.0. The results were presented in tables supported by discussions. The findings revealed that public primary schools in Waitaluk division were not fully prepared in both infrastructure and personnel for implementation of Digital Literacy Programme. The study recommends for adequate training of all teachers in primary schools in ICT literacy, training of ICT technical personnel and provision of adequate ICT infrastructure. The study findings significantly set pace for adequate planning and proper policy formulation on ICT programmes in schools by the concerned stake holders.*

Key Words: ICT infrastructure, ICT technical personnel, Digital Literacy and implementation

1. Introduction

Information Communication Technology (ICT) is the acquisition, processing, storage and dissemination of textual, voice, pictorial and numeric information by micro- electronics based on combination of computing and telecommunication technology (Haag & Cummings, 2013). ICT integration in teaching and learning in primary schools is a very important element of development in the field of education. This is because of the fact that this is the formative and discovery stage of the learners and at this stage they are very curious to learn new skills (Pajo &

Wallace, 2001). The use of ICT offers powerful learning environments and can transform the learning and teaching process so that learners can deal with knowledge in an active, self-directed and constructive way (Volman & Van Eck, 2001). ICT should be used to develop learners' skills for cooperation, communication, problem solving and lifelong learning (Voogt, 2003).

In developed countries like the United States of America, as many as 95% of schools are connected to the Internet; even at the level of the individual classroom (CEO Forum, 2000). Despite this nearly ubiquitous access to computer

technology, there is a significant gap between the presence of technology and its usage in the classroom. While some type of technology is present in nearly every classroom in the country, it is rarely used to its fullest potential (Royer, 2002). Part of this discrepancy is due to lack of comfort with using technology for teaching and learning. Even teachers who are using technology and report a high degree of comfort with technology tend to use it in fairly rigid ways, such as searching for activities to use with pupils, communicating with other teachers, and word processing (Price, Cates, & Bodzin, 2002).

For schools to use digital content appropriately they need to be fully prepared (CEO Forum, 2000). One area that makes a school to be prepared is the availability of enough teachers who are compliant in ICT. Every educator has professional development needs. From refresher courses on content areas to intensive training in new technology tools, hence professional development is a critical component of teaching and learning. It is also an essential component of any school change effort, but it is particularly useful in the implementation of educational technology and the creation of digital learning environments (CEO Forum, 2000). Many teachers who did their teacher training many years ago did not receive instruction on teaching with technology tools (Staples, Pugach, & Himes, 2005). When designing professional development activities for technology implementation, it is critical that efforts be made in two ways. First, teachers need basic technical knowledge about how to use ICT tools. Secondly, they also require knowledge about how to integrate the tools into their existing curriculum (CEO Forum, 2000).

In Africa, the use of ICT is still a challenge. For example in Rwanda, ICT is a key driving force for economic development and there is a strong political will and commitment in this area under the leadership of H.E. President Paul Kagame, who champions ICT initiatives (Hennessy et al, 2010). Despite this favorable political context, many challenges still need to be overcome in order to disseminate the use of ICT throughout the nation and more specifically in education. With limited national electricity coverage and Information Technology (IT) infrastructure, access to ICT in the education system is extremely low, with the exception of Higher Learning Institutions (HLIs). Even when ICT in education initiatives are taken up, the limited availability of digital learning material, lack of expertise and project management skills, capacity gaps among teachers to integrate ICT, lack of technical support and inadequate coordination of initiatives frequently hinder their success (Hennessy et al, 2010).

According to Hennessy et al. (2010), the most significant ICT investment in the educational sector in Uganda is the Education Management Information System (EMIS) which aims at providing quality education statistics in a timely, cost-effective and sustainable manner. This is done

through data capture on school facilities and pupil details which is coordinated at the district level and uploaded to the system for national compilation and processing. In Tanzania, there has been an effort to develop digital instructional content for basic education level although its use has not been fully realized (Hennessy et al, 2010).

In Kenya, an ICT policy was put in place in 2006 and was reviewed in 2016 (GOK, 2016). This policy puts emphasis on open access to ICT infrastructure for education institutions. It also outlines the need for capacity building of ICT human resource in order to integrate ICT in each subject at all levels of education (GOK, 2016). In addition to these, the policy puts forward strategies for online child protection through a legislative framework that embraces a practical multilateral, multi-stakeholder approach of policy, law, technical, education and awareness (GOK, 2016).

In Kenya, the Digital Literacy Programme (DLP) that has currently earned a brand name “Digi School” was borne out of the Government’s vision to equip pupils with relevant skills needed in today’s digital world (Ogolla, 2018). Its objectives were to: entrench ICT in teaching and learning process, equip public primary schools with appropriate ICT infrastructure to support teaching and learning, to develop capacity of teachers, education managers and other stakeholders with necessary ICT skills, enable development and accreditation of appropriate digital content to enhance acquisition of 21st century skills, promote universal access to ICT tools in primary schools and lastly, to integrate sustainable and affordable digital programmes in the Kenyan education system (Ogolla, 2018). The programme was designed to introduce public primary school children to the use of digital technology and communication tools in learning (Ogolla, 2018).

The programme has five key components. The first component is to provide digital devices to both learners and teachers. The devices include the teacher digital device, learners’ digital device, projector, DLP content servers (DCS), digital wireless router, power supply for grid or solar power, device storage, and charging and special needs specific devices (Mukara, 2019). Secondly, the programme provides capacity development for teachers as implementers. The programme enhances the ICT skills among teachers and communities through the teacher capacity building element of the programme (Ogolla, 2018). Thirdly, the programme provides broadband connectivity to the devices. Fourthly, the programme provides content for digital learning. The programme has a framework for identification of approved educational content materials under the leadership of Kenya Institute of Curriculum Development (KICD) which are then digitized in multimedia form (Malakata, 2015). Lastly the programme establishes local assembly for digital devices and related accessories (Mukara, 2019).

According to Wainaina (2015), the programme was awarded Ksh 17.58 billion in the 2015/2016 budget. To add to this, the programme was awarded 13.8 billion in the 2016/2017 budget (Igunza, 2016). It was also awarded 13.4 billion in the 2017/2018 budget (Mukara, 2019). On sustainability of the programme, the digital devices are being assembled locally by Jomo Kenyatta University of Agriculture and Technology (JKUAT) and Moi University (MU) (Mukara, 2019). The two institutions also deliver the devices to learning centres.

Trials for the Digital Literacy Programme were carried out in three selected schools in every county in May, 2016 (Ndunda & Njeri, 2016). More than 12,000 digital devices for the programme were distributed to 150 primary schools. Around 66,000 teachers had been trained for the programme by the time of trial phase. Although the trial phase was completed, many schools in poor and rural areas of Kenya had inadequate requirements for implementing the programme (Igunza, 2016). Some schools lacked adequate ICT infrastructure, adequately trained ICT teachers, qualified security personnel, ICT technicians and coordinators among other requirements (Igunza, 2016). The current study was carried out in Waitaluk division which is suspected to be facing the ICT challenges reviewed in this background. Waitaluk division has public primary schools where implementation of Digital Literacy Programme is ongoing.

1.1 Statement of the Problem

Since 2013, the government of Kenya has been integrating Information Communication Technology (ICT) in primary schools through implementation of the Digital Literacy Programme (Wainaina, 2015). The Kenya Institute of Curriculum Development (KICD) developed digital instruction materials for class one and two in May 2016. In addition, KICD also developed an online orientation system to train and conduct orientation for teachers (Ndunda & Njeri, 2016). This was to implement

ICT integration in primary sector in line with Vision 2030 (Ndunda & Njeri, 2016).

Despite of the above efforts, the Digital Literacy Programme has not been fully implemented in public primary schools in Kenya (Igunza, 2016). Primary school teachers and pupils have been complaining of inadequacies in ICT infrastructure and personnel needed for full implementation of the Digital Literacy Programme. The student-computer ratio is 150:1 and less than half of the more than 19000 primary schools have adequate ICT infrastructure and personnel (Igunza, 2016). The student-computer ratio is 150:1. The purpose of this study was to investigate how public primary schools in Waitaluk division were prepared towards implementation of the Digital Literacy Programme.

1.2 Objectives of the Study

The specific objectives of the study were;

- 1) To establish the availability of ICT infrastructure in public primary schools in Waitaluk division for implementation of the Digital Literacy Programme.
- 2) To examine whether public primary schools in Waitaluk division have adequate ICT technical personnel for implementation of the Digital Literacy Programme.

1.3 Conceptual Framework

The conceptual framework for this research was built around independent variables in education which contributed to a school being prepared for implementation of Digital Literacy Programme which is the dependent variable. The independent variables include availability of ICT infrastructure and availability of ICT technical personnel. The interactions between the independent variables and the dependent variable are shown in figure 1.

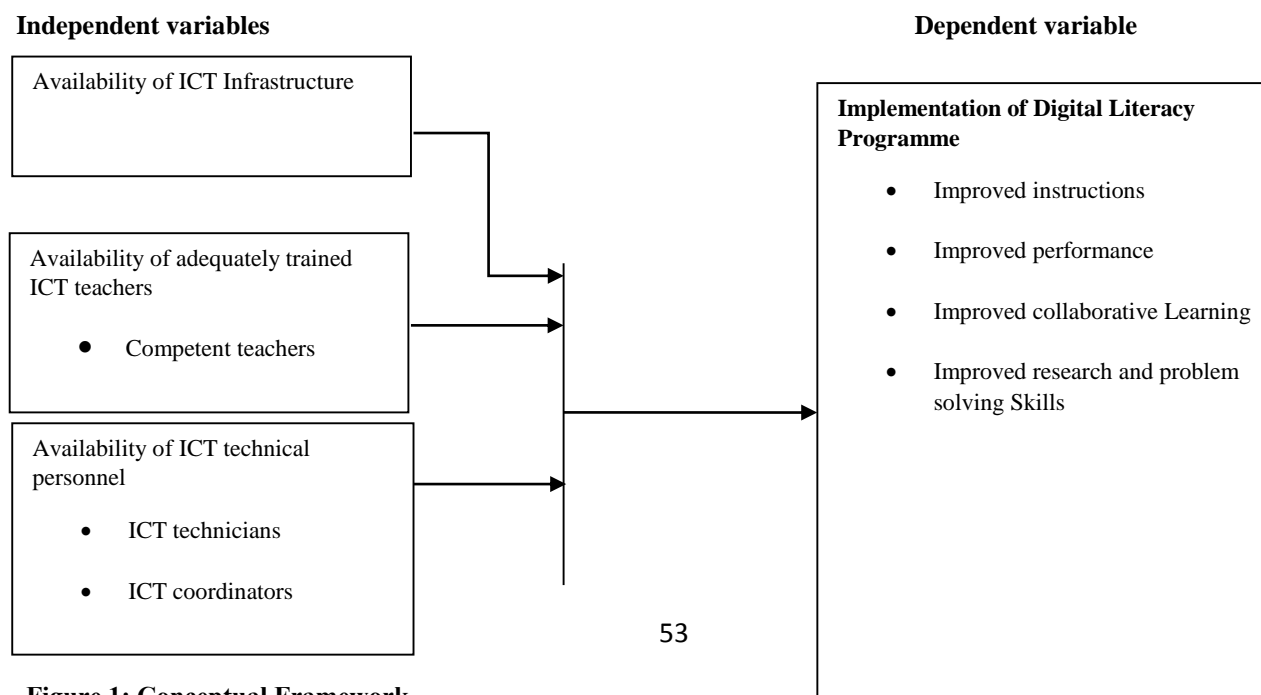


Figure 1: Conceptual Framework

The first independent variable is availability of ICT infrastructure. For any school to be prepared for ICT integration, it had to have access to ICT infrastructure which is the first step to having ICT technology available to a school (Hennessy et al, 2010). ICT infrastructure include computer rooms or computer laboratories, digitized content, ICT devices, uninterrupted electricity power and internet connectivity. Secondly, there should be availability of ICT technical personnel who are to assist teachers and pupils in the computer laboratories (Hennessy et al, 2010).

The third independent variable is availability of adequately trained ICT teachers. Public primary schools are required to have teachers who are adequately trained with ICT skills for implementation of the Digital Literacy Programme. This is because two of the most important supports for ICT integration into teaching and learning are effective Initial Teacher Education (ITE) and Continuing Professional Development (CPD) (Venezky, 2004). Both ITE and CPD have great impact on the beliefs and practice of teachers, and yet professional development time in particular is often not budgeted for (Venezky, 2004).

The variables outlined above are necessary for public primary schools to be prepared towards implementation of the Digital Literacy Programme which is the dependent variable. Implementation of this programme will lead to various benefits including improved instructions, improved performance and efficiency, improved collaborative learning, improved research and problem solving skills.

2. Literature Review

2.1 ICT infrastructure

Literature reviewed on ICT infrastructure shows that infrastructure of ICT is a fundamental condition for implementing changes to use ICT in education (Lim, Chai & Churchill, 2010). Setting up the infrastructure requires consideration of availability of physical infrastructure (UNESCO, 2012). These are rooms for servers, computer rooms, placing of cables and network points, electricity supply points, and general ICT hardware.

A study conducted by UNESCO in the year 2012 proposed a guide for teacher education institutions to set up infrastructure and hardware that is also applicable to primary schools. In their guide they included description of some key components of schools' ICT infrastructure and hardware including networks, Internet access, computer rooms, open access rooms, staff computers, computers for pupils, and digital media production facilities. Looking at ICT policy in Kenya it was found that for meaningful learning to be realized, ICT should not be considered only in terms of ease or efficiency when technology is advocated (GoK, 2006). UNESCO (2012) gave out a guide for teacher education institutions to set

up infrastructure and hardware that is also applicable to primary schools. They did not consider the Kenya's Digital Literacy Programme and left out digitized content, devices and qualified security personnel required to safeguard the ICT infrastructure for the programme. The current study sought to establish whether public primary schools were prepared in terms of digitized content, digitized devices and security personnel for implementing Digital Literacy Programme.

According to a study conducted by UNESCO (2012), both hardware and software need to be designed according to appropriate learning theories and pedagogical practices. Since different forms of ICT serve and augment different teaching and learning experiences, practitioners need to make informed judgments about which hardware or software is best suited to enhance pupil learning, achievement and the general ICT environment for the school.

2.2 Digitized content

Earlier study conducted by Hennessy et al (2010) revealed that software installed on computers is very important for ICT integration in teaching and learning activities. A study carried out by UNESCO (2012) suggested that software needs to be chosen or developed after considering the instructional strategy involved. UNESCO (2012) suggested that CD-ROM and DVD-ROM are well-suited to individualized instruction, but not necessarily for other types of pedagogy. The study by UNESCO (2012) further ascertained that classrooms which undergo the transition stage from being traditional to being ICT facilitated may face many pedagogical problems, such as lack of appropriate example materials, insufficient inside class practice, overloaded curriculum content, and disordered learning sequences. Another study conducted by Hennessy et al (2010) found out that well developed software that is motivating, organized, and interactive can help structure ICT facilitated learning activities, and also allow pupils to learn individually outside of class. Broadley (2015) suggested that schools consider their hardware needs before implementing any ICT based learning activities among pupils or teachers. The reason is that even when schools have sufficient resources to purchase different software products for teaching, their hardware is not necessarily adequate. Hardware is not limited to the efficiency of computers. Many ICT based teaching and learning materials can only be best used within an environment with sufficient and appropriate hardware, which involves physical spaces, computer devices, audio/video appliances, and other equipment for example, special sensor devices for scientific experiments (Broadley, 2015). When looking at Kenyan Digital Literacy Programme it was not clear if the above were visible in public primary schools, hence need for the current study.

In their study, Divaharan & Lim (2010) noted that when rapid changes are brought about by ICT integration in the whole curriculum, teachers need to be encouraged and supported. They indicated that one potential problem in the process is that a proposed national ICT curriculum can become inconsistent with the one implemented at the school level. To avoid this problem, schools should pay attention to a few key issues to avoid this problem (Divaharan & Lim, 2010). These key issues include planning of ICT curriculum across the school, the strategies to redirect education practices, access to courseware for ICT integration within the curriculum and opportunities for professional development of teachers and staff (Divaharan & Lim, 2010). When looking at the Kenyan ICT policy it does not give a clear guideline for adoption of technologies in public primary school for curriculum implementation (GoK, 2006).

Another study conducted by UNESCO (2012) noted that integration of ICT in the classroom involves development of ICT based assessment across the school curriculum. The practice of assessment and its effect on learning outcomes are influenced by the roles of ICT as defined by the school's ICT policy (Miller, 2009). That is whether ICT is considered as a set of skills, a vehicle for teaching and learning, or an agent for delivering other changes (Miller, 2009). In Kenya where Digital Literacy Programme is implemented ICT based assessment is still to be realized (Ndunda & Njeri, 2016).

Another study shows that ICT based self-assessment can also be used to help identify pupils' learning potential and their thinking strategies (Peltenburg, van den Heuvel-Panhuizen & Doig, 2009). Successful application of ICT based assessment may facilitate pupils' positive attitude towards learning with ICT. According to (Lugosi, 2010), internet based assessment used in group work contributes to pupils' positive attitudes towards ICT. The challenge in Kenya is that most of the above arguments are invisible in primary school which necessitated the current study to be conducted.

2.3 Availability of ICT technical personnel

ICT technical personnel include ICT technicians and coordinators. These are human resources used to set up and maintain the ICT infrastructure and support every day running (Lim, Chai & Churchill, 2010). Given sufficient ICT infrastructure for both teachers and pupils, learners also need to have technical assistants and coordinators to maintain systems and ensure that the infrastructure remains compatible with developments in software (UNESCO, 2012).

Generally the role of technical personnel include: maintaining the school network; installing new software

and upgrading existing applications, providing technical support for teachers and pupils; running diagnostics; maintaining and developing school's website and intranet; maintaining hardware peripherals; purchasing troubleshooting toolkit; ensuring internet systems are safe and offer full child protection; training teachers and pupils and liaising with suppliers on maintenance or licensing deals (GoK, 2018).

A study carried out by Divaharan & Lim (2010) found out that the ICT technicians help to maintain ICT equipment and ensure everything in the computer laboratory works. ICT coordinators help to keep up to date with new innovations in the ICT field, decide the direction of ICT use for their schools, and organize training within the school for teachers. Through planning, allocating resources and budget, and giving technical and curriculum support, such coordinators lead the community of teachers in the integration of ICT integration in teaching (Divaharan & Lim, 2010). These researchers did not narrow down specifically to public primary schools and especially the DLP in Kenya. They looked at the function of ICT technicians and coordinators but the current study sought to establish the availability of these in primary schools for implementing DLP

3. Methodology

3.1 Research Design

The study was conducted using a descriptive survey research design. Gay (1981) defines descriptive research as a process of collecting data in order to answer questions concerning the current status of the subjects in the study. The design assisted in exploring the immediate status of preparedness of schools in implementation of the Digital Literacy Programme in primary schools in Waitaluk division, Trans-Nzoia County.

3.2 Population, Sample Size and Sampling Techniques

The target population was 17 head teachers, 278 regular teachers, 34 pupils' representatives making a target audience of 329. According to Mugenda & Mugenda, (2013) a sample size of between 10% and 30% is a good representation of the target population when the study population is less than 10,000. Simple random sampling technique was used to sample out 5 public primary schools out of the 17 schools in Waitaluk division. 30% of head teachers out of 17 head teachers were sampled using purposive sampling to get 5 head teachers. 12.6% of regular teachers out of 278 teachers were sampled out using simple random sampling to get 35 teachers. 30% of 34 pupils' representatives were sampled out to get 10 pupils' representatives. This made a total sample of 50 respondents as outlined in table 1.

Table 1: Sample size for respondents

| Description | Population size | Sample size | Percentage (%) |
|-------------------------|-----------------|-------------|----------------|
| Head teachers | 17 | 5 | 30 |
| Teachers | 278 | 35 | 30 |
| Pupils' representatives | 34 | 10 | 30 |

3.3 Study Instruments

Two questionnaires were used to collect data for this study; one for the teachers and one for the pupils. Observation check lists were also utilized. The researcher used this method to obtain information on available ICT infrastructure in schools. The classes prepared for the DLP were observed and extent of implementation was ascertained.

3.4 Data Analysis

After collecting data the researcher organized and cleaned it. The data was then coded by help of Microsoft excel package. Before analysis codebooks for both pupils' and teachers' questionnaires were prepared. Planning matrices for the same were also prepared. The data yielded was both quantitative and qualitative in nature. After coding, the researcher employed descriptive statistics and inferential statistics to analyze the data through the aid of

Statistical Package for the Social Sciences SPSS version 22.0.

4. Results and Discussion

4.1 Availability of ICT infrastructure

From the findings as shown in table 2, it was revealed that none of the primary schools visited during the survey had adequate ICT infrastructure other than only uninterrupted power supply at a rate of 70% in terms of adequacy. The adequacy of the others were: internet (47.5%), computer rooms (17.5%), digitized materials (20.0%), digital devices (25%) and internet (47.5%). This indicated that all the schools under study did not have a well-furnished computer rooms for use during learning and teaching activities. The rooms which had been set aside to act as computer rooms had been used as classes before.

Table 2: Adequacy of ICT infrastructure

| Name of infrastructure | Response | Frequency | Percentage |
|----------------------------|-----------------|-----------|------------|
| | | | |
| Internet | Very Inadequate | 6 | 15.0 |
| | Inadequate | 15 | 37.5 |
| | Adequate | 17 | 47.5 |
| | Total | 40 | 100.0 |
| Uninterrupted power supply | Very Inadequate | 3 | 7.5 |
| | Inadequate | 8 | 15.0 |
| | Adequate | 28 | 70.0 |
| | Very Adequate | 3 | 7.5 |
| | Total | 40 | 100.0 |
| Computer rooms | Very Inadequate | 16 | 40.0 |
| | Inadequate | 17 | 42.5 |
| | Adequate | 7 | 17.5 |
| | Total | 40 | 100.0 |
| Digitized materials | Very Inadequate | 21 | 52.5 |
| | Inadequate | 8 | 20.0 |
| | Adequate | 8 | 20.0 |
| | Very Adequate | 3 | 7.5 |
| | Total | 40 | 100.0 |
| Digital devices | Very Inadequate | 15 | 37.5 |
| | Inadequate | 15 | 37.5 |
| | Adequate | 10 | 25 |
| Total | | 40 | 100 |

Analyzed data indicated that availability of ICT infrastructure had a positive linear correlation with

dependent variable with an R-value of 0.930 as shown in table 3

Table 3: Linear correlation on ICT Infrastructure and ICT Technicians

| | | Avinfra | Avtech | Pdlp |
|---------|---------------------|---------|--------|------|
| Avinfra | Pearson Correlation | 1 | | |
| | Sig.(2-tailed) | | | |
| | N | 295 | | |
| Avtech | Pearson Correlation | .003** | 1 | |
| | Sig.(2-tailed) | .000 | | |
| | N | 295 | | |
| Pdlp | Pearson Correlation | .930** | .311** | 1 |
| | Sig.(2-tailed) | .000 | .000 | |
| | N | 295 | 295 | |

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

This implies that availability of ICT infrastructure was one of the requirements which needed to be put in place in order for a school to be prepared towards implementation of DLP. From the researchers observation schedules only one school within Waitaluk Division had the devices

installed and had started teaching the pupils in class one using digitized materials. The concerned teachers noted that the population of the learners was high compared to the available devices and learners had to share. The teachers also complained of slow learning on the part of

the learners although they were very interested in the technological change. For a school to be adequately prepared for integrating ICT in their teaching and learning activities, they should have a well-furnished computer room with adequate digital devices, having installed digitized curriculum materials, furniture, storage cabinets, Internet and uninterrupted power supply. This agrees with a study carried out by Lim et al (2011) who pointed out that one of the basic requirements before a school starts implementing ICT technology is to set up adequate ICT infrastructure. Inadequacy of ICT infrastructure is an

indicator of unpreparedness of the public primary schools within the division. This further agrees with GOK (2018) which states that adequacy of ICT equipment makes a school ready for technology integration.

4.2 Availability of technical personnel

Other than having inadequate ICT infrastructure, some of the schools did not have even one technician. 27.5% of the respondents in table 4 indicated that they had no technician in their schools, 10% had one technician and 62.5% had two technicians.

Table 4: Whether a school has adequate technicians

| Response | Frequency | Percentage | Mean | Std deviation |
|---------------|-----------|------------|------|---------------|
| Not available | 11 | 27.5 | 3.08 | 1.328 |
| Inadequate | 4 | 10.0 | | |
| Adequate | 25 | 62.5 | | |
| Total | 40 | 100 | | |

Additionally, data from correlation analysis in table 3 revealed that availability of ICT technicians had a moderate positive linear correlation with the dependent variable with an R-value of 0.311. This indicates that Technicians are important in making schools prepared for implementing DLP. Regression analysis of the data indicated that availability of ICT technical personnel contributed in some way for a school to be prepared towards implementation of Digital Literacy Programme DLP. The technicians help in maintaining ICT equipment and ensure everything works well during the lesson (Divaharan & Lim, 2010). In an ICT enhanced environment teachers need technician who act as their assistants and the teacher only becomes a facilitator of the learning activities. The learners need adequate time with the digitized devices and they can only get this by being assisted by the teacher assistants to continue internalizing what they learn with their teachers. Technical work requires that the computer laboratory is assigned a technician who is supposed to maintain the room and the devices and assist teachers and learners when carrying out teaching and learning activities (Hew & Brush, 2007). This inadequacy affects smooth teaching and learning.

5. Conclusion and Recommendations

5.1 Conclusion

Based on the findings of this study, it was concluded that most public primary schools in Waitaluk division were not prepared in terms of having adequate ICT infrastructure, adequate technical personnel, teachers who had adequate training in ICT and qualified security personnel towards

implementation of the Digital Literacy Programme. This can be shown by the findings obtained from the study. Generally regression analysis revealed that there were other factors which affected a school being prepared towards implementation of DLP in addition to those discussed in this study

5.2 Recommendations

This study recommends that the government builds and equips computer labs in schools, which should be accessed by all the learners in primary schools and not only the class one pupils. This will ensure that the whole school community is involved in the implementation of the programme. All schools without uninterrupted power supply should be assisted by connecting them to the electricity system. Those with adequate power should be provided with enough funds for paying electricity bills. Also the schools should be provided with enough furniture and good computer rooms. Other than the WiFi which is used by the devices supplied, teachers should be provided with enough internet to use for more learning materials in addition to those supplied from KICD. This will enable them carry out online training and improve their pedagogical skills.

The government should ensure all schools have at least one technician for Digital Literacy Programme implementation. The teachers who act as technicians cannot have adequate time to prepare for their lessons and at the same time make sure that the digital devices are working well. Hence these teachers should be left to perform only their duties. The technicians employed should be professionals who have trained in ICT skills.

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