THE ROLE OF NGOs IN BRIDGING THE DIGITAL LITERACY ACCESS GAP IN PUBLIC PRIMARY SCHOOLS IN BUURI AND ISIOLO SUB-COUNTIES, KENYA

PURITY NTINYARI KINOTI

A THESIS SUBMITTED TO THE SCHOOL OF EDUCATION IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF THE MASTER OF EDUCATION IN LEADERSHIP AND EDUCATION MANAGEMENT OF KENYA METHODIST UNIVERSITY.

SEPTEMBER, 2024

DECLARATION

I declare that this thesis is my original work and has not been presented to any other university for the Award of the Master of Education in Leadership and Education Management

Signature……Date……..……

Purity Ntinyari Kinoti

EDU-3-0110-1-2022

I/We confirm that the work reported in this thesis was carried out by the candidate under my/our supervision

Signature…….Date…….…….

Dr. Lucy Ikiara

Kenya Methodist University

Signature……Date……

Dr. Ikiugu Johnson

Kenya Methodist University

DEDICATION

I dedicate this thesis to my late father, Isaac Kinoti, for the firm education foundation, and to my loving husband Ibrahim and our daughter Emmah, for their perseverance and moral backing, which has been indispensable.

ACKNOWLEDGEMENT

I am immensely grateful to God for the good health and providence throughout the study period. This study was finalized with indispensable aid, direction, and backing from my supervisors, family, and colleagues. I am deeply grateful to my committed supervisors, Dr. Lucy Ikiara (Ph.D.) and Dr. Johnson Ikiugu (Ph.D), whose consistent encouragement and priceless advice have been crucial in completing this study. I also wish to acknowledge the support of my employer, the Lewa Wildlife Conservancy.

ABSTRACT

The purpose of this study was to examine the role of Non-Governmental Organizations in bridging the digital literacy access gap in public primary schools in Buuri and Isiolo sub-counties. The study used a comparative approach, comparing access in schools with NGO sponsorship and those without. The objectives were: to assess the availability of digital learning infrastructures in NGO-sponsored and non-sponsored public primary schools in Buuri and Isiolo sub-counties; to assess the functionality of digital learning infrastructures in sponsored and non-sponsored schools; to assess the Digital Literacy programme (DLP) capacity-building programs in sponsored and non-sponsored public primary schools; and to evaluate the relevance of digital content in sponsored and non-sponsored public primary schools. The study was guided by Jan Van Dijk's Theory of Digital Technology Access and Social Impacts. The researcher used a descriptive research design, and the location of the study was Buuri and Isiolo sub-counties in Meru and Isiolo counties respectively. The study targeted 79 public primary schools in the 2 sub-counties, 79 headteachers, 79 ICT teachers, 2,192 Grade 6 learners, and their 79 Grade 6 class teachers. The researcher selected a 20% sample to get 16 schools, 16 headteachers, 16 ICT teachers, and 16 class teachers. Purposive sampling techniques were used to select 11 schools with NGO sponsorship while simple random sampling was used to select 5 schools without sponsorship for the comparative sample. Systematic random sampling was used to get a 15% sample from the learners – 329 Grade 6 learners. Data was collected using questionnaires, interview schedules, and observation checklists. The questionnaires were tested and re-tested with 7% of the sample – 1 school. Cronbach's alpha coefficient was used to test the reliability of the instruments, and the instruments were found reliable with all registering coefficients of 0.707, 0.922, and 0.817 respectively. Descriptive data was analyzed using percentages, mean, and standard deviation scores, while data from interviews was organized into themes and reported using quotes and narration alongside the findings from descriptive data. The findings showed that sponsored schools have better access to digital literacy, with the mean scores of data on each of the four objectives being much higher and standard deviation scores lower than the scores of the non-sponsored schools. Data showed that sponsored schools have better infrastructure, more functional digital gadgets, more regular DLP training programs, and better interactive digital content. Simple regression analysis showed that NGO-sponsored schools had lower p-values than the non-sponsored schools for all the variables in all the four objectives. These results indicate significant differences in infrastructure availability, functionality of the infrastructure, training programs and the relevance of the digital content available, supporting the rejection of the null hypotheses. The study concludes that schools with NGO sponsorship have better access to digital literacy and recommends among other things, more NGO support for other public primary schools, more structured and intense in-service training of teachers, and further research on the impact of the DLPs in similar and related contexts.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

CBC	Competency Based Curriculum
DLP	Digital Literacy Programme
G20	Group of twenty countries whose members represent around 85% of the global GDP, over 75% of the global trade, and about two-thirds of the world population.
GDP	Gross Domestic Product
ICT	Information Communication Technology
KICD	Kenya Institute of Curriculum Development
LWC	Lewa Wildlife Conservancy
MOE	Ministry of Education
NGO	Non-Governmental Organization
PPP	Public Private Partnership
OLPC	One Laptop Per Child
UNICEF	United Nations International Children's Emergency Fund
AUC	African Union Commission
KPLC	Kenya Power and Lighting Company
TSC	Teacher Service Commission
BOM	Board of Management

CHAPTER ONE

INTRODUCTION

This chapter will discuss the background to the study, the statement of the problem, highlight the purpose of the study, the objectives of the study, study hypotheses, the justification of the study, the limitations and delimitations of the study, significance of the study, as well as the assumptions of the study.

1.1 Background to the Study

The continued developments in technology have influenced all spheres of life, and education is no exception. Educational institutions and governments consider the use of computers and modern technology in teaching as ideal for learning in the 21st century (Srivastava & Dey, 2018). Studies have shown that 9 out of 10 jobs will require digital skills in the future. (Lyons et al., 2019).

According to Explorance (2023), digital literacy is important because it enhances: access to information and resources; connects the classroom experience to the real world; prepares learners for the modern workplace; supports different types of learning styles; enhances global awareness and cultural exchange; teaches learners how to be responsible of the internet; and makes learning fun. Murray et al. (2010) affirm this but highlight that access to equipment and quality resources is a prerequisite to the application of digital literacy and argue that in many countries, enhancing this access calls for public-private partnerships as many governments may not be able to meet this need on their own.

According to Singhavi et al. (2019), digital literacy encourages learner-centric education and helps reduce the digital literacy gaps present in different socioeconomic set-ups in developing countries. The study further reports that the place of digital technology in a country's economy cannot be overstated as in India, the contribution of Information Communication Technology to the country's economy grew from 1.2% in 1998 to 7.8% in 2017.

According to Vlies (2015), European countries have largely incorporated digital literacy in their education system and this has brought many social and economic benefits to the industrialized countries. United Nations Educational Scientific Cultural Organization (UNESCO, 2013) affirms this and adds that education systems that have embraced technology enjoy benefits such as a multimodal interactive platform for learners and a wide variety of rich content for the teachers. In Namibia, a consultative process led into successful integration of digital literacy in their education system and significantly boosted the digital literacy of Namibians, while translating into a change in their digital economy (Murray et al., 2010). The use of digital literacy in teaching and learning improves teaching abilities and content comprehension, in addition to increasing instructional efficiency and communication. (Wairumbi, 2021).

Many strategists have alluded to the power of digital literacy in addressing joblessness in Africa. Martin (2006) as cited in Tang and Chaw (2016) explains that digital literacy is acquired in levels and that access to the technology is the first level. In its social pillar, Kenya's development blueprint articulates the place of technology in boosting the country's industrialization and innovation. The government has for the last 10 years focused on investing in education and technology as this is believed to be a key roadmap to achieving most of the mid-term goals towards Kenya Vision 2030. This is even evident

in the financial commitments of the country as KSH. 14.4 billion in the 2016/2017 national budget was allocated to digital literacy in public primary schools (Kenya's Treasury, 2017). Guided by the National Laptop Policy, the government of Kenya then distributed digital hardware equipped with digital content and trained teachers in public primary schools using this allocation (Mariga et al., 2017).

The problem of digital deprivation in rural communities has continued to manifest itself in many developing countries and was even amplified further by the emergence of Covid-19. The digital literacy gap is a manifestation of inequality, poverty, and exclusion, and these are undesirable circumstances at a time when the entire world is working towards a better and fairer world by 2030 (United Nations [UN], 2015).

To ensure positive economic growth and development that benefits all citizens, Kenya must make big strides in digital literacy (World Bank, 2019) and mainstreaming Science, Technology, and Innovation into the curriculum is one positive step in that direction (GoK, 2012). The components of the national ICT in Education Policy include among others the provision of gadgets, provision of digital content, capacity building and professional development, access and equity, and technical support and maintenance (Farrell, 2007).

Kenya's current Basic Education Curriculum Framework (KICD, 2019) recognizes digital literacy as one of the key core competencies that every learner is expected to acquire. Others are Communication and Collaboration, Self-efficacy, Critical Thinking and Problem-Solving, Creativity and Imagination, Citizenship, and Learning to Learn (KICD, 2019). Concerted efforts are needed to make it possible for all learners to access digital learning because the government alone may not be able to equip all schools,

especially with Competency Based Curriculum in place. For that reason, corporates (such as commercial banks), churches, school alumni, and NGOs among other groups are onboard. NGOs are helping mobilize resources from developed countries (including the G20 countries charged with the responsibility of supporting developing countries to reduce the digital literacy gap (Lyons et al., 2019).

Kiugu (2020) established that preparation in public primary schools for digital learning integration in Meru County is inadequate. The study focused on teachers' preparedness, the adequacy of digital learning infrastructure, the effects of technical support staff, and the extent of involvement of parents in digital learning integration. This study embraced this investigation with a focus on the implementation and from a comparative perspective, with NGO support taking prominence in the investigation.

According to information obtained from the MOE sub-county directors for Isiolo and Buuri, Lewa Wildlife Conservancy is the main NGO sponsoring government schools with DLPs. Other NGOs supporting public primary schools in the same landscape include Human Practice Foundation, Kisima Foundation, Gundua Foundation, Borana Conservancy, Ngarendare Forest Trust, Food for the Hungry, We World, World Vision, Caritas, among others.

1.2 Statement of the Problem

The United Nations International Children's Education Fund (UNICEF) acknowledges that African governments must prioritize digital literacy in schools in order to secure the future of African children in a fast-growing competitive yet digital world. Numerous policy guidelines, followed by the mainstreaming of digital literacy into the day's education system along with the financial investment made by Kenya's government and

other partners towards producing a more digitally literate population should translate into public primary schools that have access to adequate and functional digital devices, present technical support, functional and regular teacher capacity building programs, and updated digital content for optimal utilization of the digital gadgets. The CBC is designed to ride on digital literacy as the main vehicle to the attainment of all seven core competencies, and the content currently in the curriculum design heavily draws from online sources, especially YouTube. The expectation is that the modern-day teacher and learner, irrespective of their economic, social, religious, geographical, or cultural backgrounds, must have access to resources to enhance digital literacy.

However, this is not yet the case as access is still limited. The August 2023 report on the implementation of CBC by the Presidential Working Party reveals that the Digital Literacy Competency was among the poorly attained competencies, with an average of 47.6% (Government of Kenya, 2023b). Inadequate access to digital literacy and the low capacity of users were identified in the report as the major challenges in schools as the country rolls out a new education system. The specific access indicators are confirmed by (Wairumbi, 2021) and include insufficient competencies of the teachers, inadequate digital infrastructure, insufficient administrative and technical assistance, and poor learner involvement. The gadgets donated by the government are believed to have been put to little use in most of the schools. Also, the gadgets were donated only once to one group, pointing out the possibilities of inadequacy hence limited access. These statistics are indicative of the existing challenge in attaining digital literacy and help point out the differences that exist among various groups in society.

With CBC now in the 8th year, we continue to witness the digital inequalities existing in our public primary schools. While some learners can watch a video on how to swim

before practicing in the school pool, others can only get the concept from the teacher and practice on top of tables or on the ground. It is these kinds of inequalities that have attracted NGOs and other entities to move in and support reducing the digital literacy access gaps in public primary schools in Kenya, especially those in remote areas. If nothing is done, these inequalities in access will continue to demean the quality of education in rural schools, and school graduates from these areas will miss out on many opportunities globally, including further studies and job opportunities.

Lewa's DLP is one such intervention that has seen 18 public primary schools benefit from the provision of digital equipment, technical training for learners and teachers, and regularly updated digitized and enriched content among other privileges. Lewa has done this with the hope that her efforts will help increase digital literacy among the learners in these schools, most of whom come from underprivileged backgrounds less exposed to technological developments.

However, having observed the differences in access and implementation, the researcher has been moved by the situation and the fact that there has not been any scientific study to measure role of NGOs in bridging the digital literacy access gap in public primary schools and document any learnings that would be relevant to the schools, the conservancy (especially to advise scaling), the funders, other NGOs, and education practitioners offering this form of support, as well as the government of Kenya. Therefore, this study sought to make evident the role of NGOs in bridging the digital literacy access gap in public primary schools in Buuri and Isiolo sub-counties, Kenya.

1.3 Purpose of the Study

The purpose of this study was to evaluate the contribution of NGOs in reducing the digital literacy gap in public primary schools in Buuri and Isiolo sub-counties, Kenya.

1.4 Research Objectives

The following objectives guided the study:

i. To assess the availability of digital learning infrastructures in NGO-sponsored and non-sponsored public primary schools in Buuri and Isiolo sub-counties

ii. To assess the functionality of digital learning infrastructures in NGO-sponsored and non-sponsored public primary schools

iii. To assess the availability of DLP capacity-building programs in NGO-sponsored and non-sponsored public primary schools

iv. To evaluate the relevance of digital content available for teaching and learning in NGO-sponsored and non-sponsored public primary schools

1.5 Research Hypotheses

The study was guided by the following null hypotheses:

i. $H_0 1$: There is no significant difference in digital learning infrastructure between public primary schools with NGO sponsorship and those without the sponsorship.

ii. $H_0$2: There is no significant difference in the functionality of the digital learning infrastructures between public primary schools with NGO sponsorship and those without the sponsorship.

iii. $H_0$3: There is no significant difference in DLP capacity-building programs between public primary schools with NGO sponsorship and those without the sponsorship.

iv. $H_0$4: There is no significant difference in the relevance of digital content between public primary schools with NGO sponsorship and those without the sponsorship.

1.6 Justification of the Study

This study is aligned with the direction education and research are taking globally and in Kenya. Kenya is currently struggling with resources, evident in the harsh economy, suspension of subsidies, increase in taxes, and much more. Quality education that is responsive to the needs of all citizens and industry remains paramount and that the place of digital literacy in the current global climate is irreplaceable (World Bank, 2019). Digital technology is so important to every nation and individual today and is key to Kenya's development agenda. The researcher carried out this study to inform basic education practitioners in the country of the contribution of NGOs in reducing the digital literacy gap and to draw a comparison in digital literacy between schools with NGO support and those without, with a view to highlighting the complementary role of NGO intervention in addressing the digital gaps in public primary schools in rural communities.

1.7 Limitations of the Study

This study was faced with the following limitations:

The regular transfer of teachers affected data collection from the teachers because there were a few new teachers who did not have ample experience in the schools to understand how digital learning has been happening. To counter this, the researcher worked with the school administration to identify teacher respondents who have been in the school for at least a year.

Secondly, some of the sampled schools in Isiolo have rough terrain and insecurity challenges. The researcher worked with the local Ministry of Education officials and the NGO teams and joined them on the days they were accessing the schools for ease of movement.

1.8 Delimitation/Scope of the Study

While the digital literacy gap is present among learners of all levels and efforts are being made to bridge the gap through the different institutions, this study investigated the digital literacy gap from the primary school level, specifically targetting Grade 6 because it is the highest level of primary school in the current system and this group has had the most exposure to CBC and digital literacy. The researcher did not consider other education levels such as secondary schools, tertiary institutions, and adult learning centers.

There are many entities investing to reduce the digital gap through schools. This study was delimited to NGOs only as this is what is doable in one single study. Specifically, the Lewa Wildlife Conservancy was the NGO used in the study because it was identified

by the Meru and Isiolo county education officers as the main NGO supporting DLPs in the landscape. The study did not focus on the contribution of other players like the government, corporates, parents, and school alumni networks among others.

The study was delimited to public primary schools in Buuri and Isiolo sub-counties (Isiolo is the name of both the county and the sub-county under investigation), which are in Meru and Isiolo counties and receive NGO support. Private primary schools were not involved in this investigation as the target study group was the learners and teachers in the public primary school system.

1.9 Significance of the Study

The findings will also inform the Government of Kenya and its agencies such as KICD, MOE, and the ICT Authority of Kenya. KICD has the national curriculum in digital literacy and the study gives some insights into some of the effective ways of ensuring rural children have access to this content.

This study provides useful data and findings with vital information to education planners and government institutions. This is useful because modern best practice advocates for partnerships and especially PPPs, where governments can tap into the potential in NGOs and other private entities to support local development.

This research adds to the existing body of knowledge on the digital literacy gap and future researchers have an additional resource to reference.

1.10 Assumptions of the Study

The study was anchored on the following assumptions:

1. That all expected respondents would be available to answer the content in the questionnaires.

2. That the respondents would be able to identify the relevant issues associated with access to digital technology.

1.11 Operational Definition of Terms

Application: This refers to a computer program that helps the user perform a specific task. It can be a stand-alone or one that is connected to other applications to function.

Access: The ability of individuals to have the resources needed to interact with digital technology

Access gaps: The deficiencies that exist denying individuals the necessary reources and exposure to digital technologies

Bridging digital gaps Providing a remedy to reduce digital illiteracy.

Competency: The ability to apply appropriate knowledge, skills, attitudes, and values to successfully perform a function.

Digital Dividends: These are the benefits that arise from using digital technologies. They include job creation, economic growth, and access to financial and non-financial services.

Digital learning infrastructure: Computer hardware (such as tablets, laptops, desktops, projectors, smartboards) and software that is found in schools and used in teaching and learning

Digital literacy: Having the knowledge, skills, and behaviors which are necessary to use a wide range of digital content and devices effectively and safely.

Functionality: The ability of digital devices to operate and be usable whenever needed

Gap:	The existing distance between the current digital abilities and the desired competencies
Hardware:	The physical technological gadgets used in the execution of technology-related activities. Such computers, tablets, iPad, smartboards, and phones
Software:	The applications that make computers and computerized devices perform the work they do. Software cannot be seen or touched but computerized gadgets cannot work without them
Technical: support:	Support offered to teachers and learners to enable them comfortably to utilize the gadgets and access digital content
4th Industrial Revolution:	The current and next phase of technological developments that will change the way people live and work
Technophobia	Avoiding interaction with technology for fear of inability to utilize it and due to unfamiliarity.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section discussed the reviewed literature from a global, regional, and local perspective. The discussion is arranged as per the objectives of the study, starting with literature on ICT infrastructure, the functionality of ICT infrastructure, capacity building, digital content, and culminating in a summary of the literature reviewed and the gaps identified. The chapter also discusses the theory informing the study and concludes by providing a conceptual framework.

2.2 Digital Literacy

All children in the world deserve equal access to quality education, irrespective of their geographical location. According to (Morgan, 2007), while many sectors of the economy have sought to keep up with advances in technology, the education sector has been slow, and this continues to widen the gap between education and the skills required in industry. Kenya has been in the frontline in the adoption of technology in various sectors including business, mobile money services, government services among others. The rate of cybercrime has also gone high in the country and worldwide.

The Dakar declaration of 2000 recognizes the potential of digital literacy in enhancing knowledge dissemination and effective learning. Lyons, Kass-Hanna, Zucchetti, and Cobo (2019) highlights that the digital literacy gaps in the world exposes vulnerable populations to future loss of income and further poverty and that efforts need to be made to support these populations to bridge this gap so that in the future. They can enjoy digital

dividends which include an increase in human and social capital, employability, and earning potential. This is also affirmed in a digital skills report recently published by the International Finance Corporation stating that in Sub-Saharan Africa, 230 million jobs require digital skills by 2030 (IFC, n.d). Lyons et al. further recognizes that digital technologies are spreading rapidly, and so is the mismatch between digital skills required in the job market and education. The article continued to acknowledge that a big segment of school graduates is ill-prepared to fill the existing job opportunities because while the jobs need at least a set of basic digital skills, many school graduates do not possess these.

Keengwe, Onchwari, and Wachira (2008) as cited in Singhavi, Basargekar, and Somaiya (2019) categorizes digital literacy gaps into first order gaps (which have to do with inaccessibility of resources) and second order gaps (mainly concerned with school culture and teacher-level factors such as their willingness to learn and utilize technology in teaching. Bingimlas, (2009) as cited in Singhavi et al., (2019) reported that digital literacy gaps can be extrinsic (relating to access issues such as unavailability of resources, time, support system, training facilities, among other factors) or intrinsic (relating to attitudes, beliefs, practices, and the resistance of the teachers). This research focused mainly on the first order and extrinsic gaps, and the role NGOs are playing to bridge them.

The demand for digital literacy in schools globally remains high and different countries are putting different policies and actions in place to address the challenge to remain globally relevant and to place their citizens at a competitive advantage globally. Digital literacy cannot be acquired without the right gadgets and infrastructure in place because it is a competence that requires practical exposure and practice. Singhavi et al., (2019) noted that the government of India has implemented policies to help encourage ICT

integration in learning but the uptake by teachers and schools is still quite low. This is not different from the situation in Kenya as there have been cases of teachers resisting the technology however much the learners are eager to use the gadgets. It is even harder for older teachers who did not interact with the technology in their pre-service training and their age subjects them to technophobia.

According to Murray, Moore, Stokes, Angeli, Khadivzadeh, Saif, Molinatti, Yin, Vussc, Willingham, Miller, Walters, Frei, Abraham, and King, (2010, Namibia continues to lead in both engagement of NGOs and other civil society groups in education, and the integration of ICT in learning. This study draws a relationship between the working PPPs in educational support in the country and the adoption of ICT in learning. The country's educational policies and operative frameworks are properly understood and interpreted, leading to a seamless working relationship that benefits the education sector on the digital literacy front (Murray et al., 2010). Currently, the Human Capital Index shows that sub-Saharan Africa realizes only just over half of its human capital potential, despite the growth of its young population (UNICEF-AUC, 2021). Investing in digital education, digital literacy and online learning opportunities for Africa's children and young people is critical to directing this scenario towards a more positive trajectory.

Murray et al. (2010) expounds that in Namibia, ICT integration in education is taken very seriously and a steering committee was formed in 2004 that has since coordinated efforts and inputs from all key stakeholders to ensure every opportunity is tapped to make it work. This collaborative network comprises the Namibian government, NGOs and civil society groups supporting education in the country, international and local private sector, donor development agencies, learning institutions among others. This has led to higher digital literacy levels of Namibians and in turn, better digital economy returns. This

collaborative approach is very key as human beings by nature will more likely support what they have been engaged in developing as they feel respected and will own it.

Morgan (2007) acknowledges that education technology is an expensive investment and that governments alone cannot equip the schools to meet the rising demand. He says that NGOs come in handy and support in developing digital learning content; delivering the content; training and mentoring teachers on the use of software and content; maintaining and troubleshooting both the devices and the software; and sharing learning results and data to improve the management of education information.

In joint efforts to draw lessons from the Covid-19 school closures, UNICEF and African Union Commission see the Covid-19 pandemic and the associated challenges in the education sector as an opportunity to re-engineer education in Africa, with a focus on digital literacy and teacher capacity building to be able to deliver the same (UNICEF-AUC, 2021). The study recognized that Africa has the youngest population in the world with 3 out 5 people being under the age of 25 years old, and this means that the continent can invest properly in modern education practices to produce globally competitive human capital. UNICEF urges African governments to take cognizance of this fact and invest more in digital education to secure the future of their people and increase their economic potential.

In Kenya, the fiscal year 2023-2024 has seen a boost in the allocation of funding to education, with Ksh. 628.6 billion (27.4% of the country's planned expenditure) allocated to education (Government of Kenya, 2023a). However, it is worth noting that in the budgetary breakdown, there was no funding allocated to DLPs at the primary school level. There was only KSH. 400 million allocated to digital literacy in secondary

schools. The researcher takes note of this and finds it incongruent with the national goal of transforming the country into an industrialized nation by 2030. The foundation is the primary school, and there must be continued concerted efforts to ensure every primary school has reliable access to digital learning. This should be reflected in the national treasury budget as well.

On PPPs, the Odhiambo Report of 2012 - as cited in Government of Kenya (2023b) - grouped private sector participation under six categories, namely: Development Partners, Private Investors, Civil Society, Sponsorships, Faith-Based Organizations, Community-Based Organizations and NGOs. These development partners and other stakeholders have significantly contributed to the provision of quality education in Kenya. The MOE coordinates the development partners through MoE/Donor Sector Consultative Group and the Education Donor Consultative Group. The Government of Kenya (2023b) however notes that Kenya does not have a clear framework for PPPs. It is worth noting that NGOs can offer meaningful support in countries that have an enabling policy system.

Kenya's long-term development blueprint's (Vision 2030) goal of creating a globally competitive and prosperous nation cannot be possible without the contributions of the ICT sector, whose strategies are captured in the Economic pillar of the blueprint. One of the objectives of Kenya's reviewed ICT Policy of 2020 is to grow the contribution of ICT to the economy to 10% by 2030 (Ministry of Information & Communications, 2020). Through the current education framework, the government's target is to implement a CBC, 2-6-6-3, introduced in 2019 to meet the Vision 2030 of science and technology and innovation. CBC requires learners to be engaged in class to become creative thinkers and develop knowledge and skills to meet the vision of 2030. ((Nyaboke et al., 2021). This underscores the gap between policy intentions and on-the-ground realities, where the lack

of adequate digital infrastructure could hinder the development of essential skills needed to contribute to the ICT sector and, by extension, the national economy. NGOs play a pivotal role in bridging these gaps, especially in regions where government efforts are insufficient, making the assessment of digital infrastructure availability in NGO-sponsored versus non-sponsored schools critical to understanding and addressing these disparities.

2.3 Digital Literacy Infrastructure

Access to digital literacy starts with access to digital gadgets and the supportive installations. Gadgets ranging from computers, projectors, tablets, iPads, laptops and smartboards are some of the common digital infrastructures used in schools by teachers and learners to enhance digital learning and integration of digital literacy in teaching and learning. These gadgets also need to be charged, and so reliable sources of power are key in enhancing this access.

In a study conducted to establish the barriers perceived by teachers in the implementation of ICT in the classroom by teachers in Manarashtra in India (Singhavi et al., 2019), the insufficient digital literacy hardware was identified as one of the major barriers. The study recommends that schools should consider the PPP option to support an increase in access to the required infrastructure. With these partnerships, it is possible for public schools to increase access to key facilities to support learning as the government alone cannot finance education fully. Many countries have adopted the cost-sharing policy of financing education, and this is very common and effective in this century.

Joynes et al. (2020) also supported this, who sought to investigate the policy and strategy interventions implemented to respond to the rapid school closures due to Covid-19 in

Asia and Sub-Saharan Africa. the study concludes that multi-partner approaches are key in increasing access to digital literacy in schools through the provision of gadgets and infrastructures needed to support digital learning, subsidizing the cost of internet, developing educational content and making it easily accessible and supporting the development of educational platforms are some of the ways in which non-governmental partners offer their support.

To determine the capacity of African countries to support learners during the COVID-19 school closures, Krönke (2020) explored the digital capacity of 34 African countries. The findings indicate that on average, only 19% of the households have both a computer and a smartphone that can access the internet while 25% of the households have access to a smartphone that can access the internet. Further, the study indicated that the digital literacy gap is more pronounced in rural areas than in urban areas while 32% of the households in urban areas have access to both a smartphone and a computer, while only 9% of rural households have the same privilege.

In Kenya, the study showed that 17% of the households had both a computer and a smartphone, 26% had either a computer or a smartphone, 40% owned a phone but with no access to the internet and have no computer, and 17% had neither a computer nor a smartphone (Krönke, 2020). A similar study by UNICEF-AUC (2021) found out that approximately 48% of learners did not have access to digital technology to enable their participation in remote learning in Western and Central Africa. The joint study further shows that the digital literacy gap is multifaceted: there are gaps in access to the internet, mobile phones, mobile internet services, ability to create technology, as well as in basic digital literacy. As at 2021 34% of households had internet access in Africa, and around 89% of learners did not have access to a computer at home. Only 53% of learners in

Northern Africa, and 8% of learners in sub-Saharan Africa, have access to a computer. Only 14% of learners in sub-Saharan Africa have access to the Internet at home (UNICEF-AUC, 2021).

According to Tikly (2019), greater use of ICT to support learning in schools is a priority for the Continental Education Strategy for Africa (CESA) if the continent will realize sustainable development. The study, however, noted that this was far from an achievement as up to 95% of public primary schools in the continent lack access to electricity, hence limiting their ability to use ICT in learning. Further, the study highlighted that UNESCO's costing estimates and spending projections to 2030 for the achievement of education targets suggest that, on average, countries will need to have increased spending on pre-primary, primary, and secondary education from 3.5 to 6.3% of GDP between 2012 and 2030 (UNESCO 2013). In most countries in sub-Saharan Africa, the costs will need to triple as a percentage of GDP to expand access to education to all including the most marginalized groups. This means funding the proposals in CESA likely remained heavily dependent on donors. These statistics affirm the importance of investing in digital literacy in schools. Education is recognized as the most positively transformative investment in the world and so is digital education in the 21st century. The learners coming from these digitally deprived homes should get the exposure in school for them to be able to transform their future and the future of their families and communities.

India implemented the One Laptop Per Child (OLPC) initiative whose objective was (and still is) to introduce low-cost computers in schools in developing countries (Ale et al., 2017). A detailed investigation into the impact of this program by (Ale et al., 2017) revealed that while many viewed the success of the program as the successful delivery

of the hardware, there was lack of understanding on the psychological mechanisms at the user level that influence learning and the impact of the investment. These authors reported that the main task is to figure out the implementation mechanisms, considering the attributes of the end user.

CESA also advocates the use of PPPs in the provision of schooling. Tikly (2019) observed that the support from both NGOs and philanthropic organizations has been very instrumental in supporting education in Africa. The study acknowledges that NGOs operate, and support education and other development areas mostly aligned with their agenda of boosting the economic and well-being of the people, and with an overall objective of fostering sustainable development. This is also supported by the Republic of Kenya - Ministry of Education Science and Technology (2015) that reported that one of the ways of fostering an equitable learning environment for children of all gender is by working with partners and community members to encourage and facilitate the use of ICT in all learning levels and institutions.

Kenya's implementation of the OLPC programme was well aligned with the then National ICT Master Plan of 2012-2017 that sought to guide the country into quick ICT investment and innovation, and with a special focus on developing digital literacy skills among young learners in primary schools. This was also aligned with Vision 2030 and was quickly taken up by the Jubilee government as one of their campaign manifestos, and deliverables when they were elected to office in 2013. When the tablets for lower primary learners and computer laboratories for upper primary school learners (phase 1) were finally delivered, it became apparent that digital literacy was not just about provision of gadgets (Njue, 2019). In many schools, reports indicated that the gadgets were left unutilized with some teachers seeing them as property of the government that

would cause them serious consequences should there be damage or loss. This left many uncomfortable using the devices, leaving several untouched and gathering dust in the cabinets. There were also instances of misuse of the gadgets, with some pictures circulating on social media at some point showing an individual using one of the tablets to record proceedings in a political rally. These reports are indicative of an incomplete project.

However, UNICEF-AUC (2021) found Kenya's DLP as one case study that can be used across Africa. They reported that it was implemented in a multi-stakeholder approach with the ICT Authority as the implementing body, and that the program targeted learners in all public primary schools in Kenya with five key components: the provision of digital devices preloaded with interactive digital content covering different subjects for both learners and teachers; capacity development for teachers and implementers; broadband connectivity devices; the provision of content for digital learning; and the establishment of local assembly for digital devices and related accessories. The schools were equipped with laptops for teachers. Tablets for learners, projectors, and those that have no access to the national grid connected to solar power.

2.4 Functionality of Digital Gadgets

In addressing the second objective of assessing the functionality of digital learning infrastructures in NGO-sponsored and non-sponsored public primary schools, the study focused on evaluating not just the presence of digital devices but their actual use and effectiveness in enhancing digital literacy. The data highlighted that while access to digital gadgets like computers, tablets, and smartboards is crucial, the availability of supportive infrastructure such as reliable power sources is equally important. The study

emphasized that merely providing digital devices is insufficient if the psychological and practical aspects of their use are not addressed. In Kenya, where digital tools remained unused or misused underscored the need for comprehensive strategies that include teacher training, community engagement, and proper infrastructure support to ensure the functionality of digital learning infrastructures. The study thus aimed to understand how effectively these infrastructures are being utilized in both NGO-sponsored and non-sponsored schools, recognizing that proper functionality is key to achieving the intended educational outcomes.

It is one thing to have digital gadgets and power to charge them, and another to have them functioning properly to support teaching and learning. Every digital gadget (even those used at home by individuals) often needs maintenance and repair for them to remain usable. Digital gadgets are not designed to sit unused and without power for days, weeks or months. This renders them dysfunctional.

In India, ICT is taken as a separate learning area to build the computer skills of the learners and enhance the integration of ICT in learning. However, the uptake is still not impressive and Singhavi et al. (2019) noted that among other barriers, there is inadequate resources, lack of a proper vision, lack of trained personnel, lack of monitoring and feedback systems, lack of maintenance and repairs of the tools and equipment, as well as lack of ICT based good quality educational content.

A key consideration to the usefulness of electronic gadgets is reliable power sources, as they must be powered. UNICEF-AUC (2021) found out that by 2021, 98% of public primary schools in Kenya had access to power, of which 83% were connected to the national grid and 15% to solar power. However, in June 2023, the Presidential Working

Party on Educational Reforms published and presented their final report on the implementation of CBC in the country and one of their findings was that the integration of digital literacy was a challenge due to the lack of power and the internet in many parts of the country (Government of Kenya, 2023b). This contradicts the report by UNICEF-AUC and calls for further evaluation. The UNICEF-AUC reports had indicated that by 2021, 93% of public primary schools had access to digital devices. (Government of Kenya, 2023b) on the other hand raises concerns over low digital literacy in public schools citing among other causes, lack of or faulty digital devices that cannot support digital learning.

The working party's findings report that only 76.7% of public primary schools are connected to the national grid, 13.1% to solar power, 2.4% are not connected to any form of power, 7.5% have intermittent power supply and 0.3% (80 schools) have been disconnected for failure to pay bills and related challenges (Government of Kenya, 2023b). Omito (2020) on the other hand found that among the sampled schools in Homabay, 74.8% had functional electric power while 25.2% had no source of electric power. Of the 74.8%, 94.4% did not have any power back-up in place (power generators or solar power) in case of mains power outage. The study also showed that 94.4% of the sampled schools did not have UPS, meaning that any power outages would disrupt any digital literacy learning activities going on.

Currently, the cost of electricity has really gone up and it remains a challenge to the schools as many might end up being disconnected for failure to pay power bills. This adversely affects the implementation of DLPs in such schools. This is also captured in the below statement by a headteacher as was interviewed by (Omito, 2020). "There should be a way of having a power back-up. There should be a power backup because in

our area there is power surge. The power can even fail for a whole week so if you come up with a plan for a project where this no power failure, the lessons may not go on for a whole week." (Head teacher, Ndhiwa).

Every digital equipment needs regular maintenance and repairs to remain useful and functional. In Homabay County, (Omito, 2020) found out that 82% of the sampled primary school teachers are not aware of any repair and maintenance plan for the government-donated tablets and computers, do not know anyone who can offer them the technical support for maintenance, and do not know what to do with the gadgets in the event of breakdowns. This is indicative of a not-very-successful DLP as maintenance is key for the gadgets to continue being useful knowing that all electronic gadgets must have an issue at one point or another.

2.5 Availability of Capacity Building Programs

For teachers and learners to utilize digital devices effectively, they need training and retraining programs to help them get familiar with the technology. People have different perceptions about the use of technology and teachers are no exception. In most cases, learners are eager and acquire the technology with ease and it is fun to them. However, this is not always the case with teachers. Depending on orientation and age, some teachers suffer technophobia, and this can be a hindrance to effective acquisition of digital skills. Programs to build the capacities of users come in handy and their absence reduces the chances of successful utilization of any available digital technology in the schools.

The United Nations Educational Scientific and Cultural Organization (UNESCO) estimates that an additional 17 million teachers will need to be recruited across the

continent by 2030 to meet the envisaged expansion in learner numbers. There is a need also to focus on the professional development of teachers and the provision of teaching and learning materials including textbooks (Tikly, 2019). This is a reality and a need that is always demeaning quality education in Africa and in Kenya because inadequate teacher capacity leads to under-utilization of the existing.

Teachers' training programs play a very positive role not only in building computer skills and competencies but also in building positive attitudes and beliefs, which are extremely important for the successful implementation of DLPs in schools (Singhavi et al., 2019). This article further recommends that digital literacy be a core component of the curriculum in education in India and encourages all teachers to be trained to integrate technology into their classroom teaching.

Ale et al. (2017) notes that in rural schools in India, and most developing countries, the OLPC program was challenging because teachers in those set-ups were not willing to learn how to use the gadgets as they imagined such training would be too complex and beyond their ability. Many expressed psychological barriers because they lack the technical capacity to troubleshoot and fix any technical problems the gadgets may develop. This is a challenge facing all developing countries. Once the digital infrastructure is in place, a major challenge relates to the capacity of teachers to take advantage of the equipment and new teaching opportunities offered by digital equipment (Murray et al., 2010). This involves developing teachers' digital capacities and the regular support mechanisms. Furthermore, beyond technical competences and coaching, effective utilization of technologies in the classroom to foster digital literacy among learners (and the teachers) ultimately depends on the motivation of teachers.

The major challenge remains on how to transform teacher training into improved teacher practices in the classroom. Murray et al. (2010) suggests that the best incentives for teachers come from the evidence of improved and more efficient teaching practices, and that addressing this challenge often involves a cultural change for teachers which cannot always happen rapidly. This is a combination of both skills and usage gap and if not addressed, the possibility of finding digital gadgets gathering dust in offices is very high.

For effective use of digital skills in delivering the curriculum, it is paramount for teachers to acquire not only the basic technical skills but also the necessary pedagogical skills required for them to effectively integrate digital skills in teaching (Ale et al., 2017). This is especially true in the current education framework that requires digital integration in every learning area as teachers are expected to integrate and not teach digital literacy as a separate component. (KICD, 2019).

According to (UNICEF-AUC, 2021) 331,000 teachers have been trained in ICT integration, 218,253 trained in the use of technology to implement the CBC, and 93,009 teachers trained in the use of ICT and digital devices to support the Digi school program in Kenya. They further recommend that for Africa to transform the education of its children, every country must prioritize quality training for teachers, including equipping them with digital literacy skills and pedagogies that promote learner-centric inclusive quality education. In Kenya, there is an allocation of KSH. 1.3 billion for training teachers on CBC in the 2022/2023 budget allocation (Government of Kenya, 2023a) and this is a positive step towards enhancing the quality of education through raising the quality of instruction.

2.6 Availability of Digital Content

If digital gadgets are available, there is power to charge them and users have been trained on their use, then for them to remain useful, there must be relevant and updated content to motivate the use of the gadgets. In schools, and especially with CBC, teachers are supposed to use digital technology in teaching. They can use technology to show pictures, videos, play music, perform mathematical activities, create solutions using coding among other forms of content that are in line with the learning areas for the day. For instance, in teaching Physical Education (PE), the curriculum design requires the teacher to show a YouTube video on how to play soccer before proceeding to practice in the playfield. For this lesson to be properly delivered, a teacher needs to have access to the video and a means of projecting it in class.

In the research study conducted by Tosco, the learners indicated that they felt that the lessons that incorporate technology keep their interest and help them remember better the materials and the learning areas involved (Tosco, 2015). The study concluded that ICT enhances learning outcomes by improving areas such as literacy and numeracy. Laal and Ghodsi (2012) explain that the benefits of collaborative learning with interactive digital content enhanced through ICT integration involve improvements in examination scores, learners' positive perception concerning academic experience, improved problem-solving, communication, and qualitative skills. Studies have shown that collaborative learning, compared to individual knowledge, offers learners the opportunity to discuss and attain a higher level of thinking and enhanced concept retention.

The provision of platforms and suitable content that encourages the use of digital gadgets is key in fostering the uptake of digital literacy. Hacker and van Dijk (2000) report on a survey conducted in Germany to measure the motivation levels of people of various societal levels to use digital gadgets. The results show that regular training of users must be accompanied by the provision of user-friendly content and platforms for the trained users to comfortably embrace technology. In several instances, teachers are trained on digital integration but when they go back to their schools, they do not have the appropriate digital content to allow them practice what they have learned and pass on the knowledge and skills to the learners and their colleagues. This ends up being wasteful and meaningless training and affirms the importance of having adaptable relevant digital content for digital literacy to be attained.

This is also echoed by Singhavi et al. (2019) who found out that the lack of appropriate academic digital content is one of the barriers to the implementation and adoption of digital literacy in education in India and that India acknowledged the need to improve the quality of education offered in schools and they put in place policy guidelines to address this. They reported that the use of digital technology in education is one way to improve the quality of education by providing access to quality digital content in the country while at the same time addressing the problem of digital literacy in India. The article recommends that schools collaborate with organizations working in digital education to increase access to the same, while ensuring that the voice and input of the teachers is incorporated.

According to UNICEF-AUC, 2021 the gadgets donated to the public primary schools in Kenya were pre-loaded with interactive content. However, Wanzala and Nyamai (2018) as referenced by Omito (2020) report that this DLP content was treated as source of

entertainment for the learners instead of being used as a learning tool. They argue that minimal awareness, training, and monitoring was offered to the teachers and that even the technical capacity to access the content and utilize it in teaching was not there. They continue to report that in some cases, teachers found the content rigid and not fit to their context and situation and since there was no room to adapt it to their situations, the content ended up not meeting their needs and therefore minimally utilized.

The Government of Kenya, (2023b) recognizes that the emergence of Covid-19 brought with it an increase in the application of digital content and that teachers need regular capacity building to be able to navigate the various platforms through which the content is accessed. The report affirms the importance of CTPD (Continuous Teacher Professional Development) if properly implemented and recommends reforms in the pre- and in-service training of teachers. The study took note of the teacher in-service training programmes aligned with CBC implementation, and even reflected in the 2023/2024 budget. CBC also recognizes teachers as curriculum developers, and this too is key because teachers are just guided by the curriculum designs but are free to use content from various sources to deliver on the learning area. Use of digital sources and media is highly encouraged, and this might increase the consumption of digital content.

2.7 Summary of the Literature Review and the Gaps Identified.

The preceding discussion has provided a detailed literature on the nature of digital literacy attainment and strategic interventions by individual countries and their respective education sectors and schools. The review has covered topics such as the state of the digital gap, the relevance of digital literacy, the state of the digital infrastructure in the

schools, capacity building programmes for teachers in reference to the implementation of the DLP and availability of updated digital content in the schools.

There are gaps in information on the state of the digital gadgets donated to schools and the researcher could not find answers to several questions such as: who services the gadgets? Who services the solar power installations in remote schools? Are they still functional several years later? These concerns directly relate to access to digital literacy. From the policy documents, the researcher did not find any information regarding the plans and strategies put in place to service the gadgets and replace those found dysfunctional.

The literature review was unable to find information on how the pre-loaded content continues to be updated, and this was a concern subject to empirical investigation. There has since been a change of the curriculum, and the researcher did not come across reports on policy or plans to review the pre-loaded content to align it with the current CBC requirements.

2.8 Theoretical Framework

The study used Jan Van Dijk's Theory of Digital Technology Access and Social Impacts (Hacker and van Dijk, 2000) to guide data collection, analysis, and interpretation of the findings. This theory was found relevant to this study because it explains the digital literacy gap mainly from an access perspective and explains that access is the main aspect that brings about digital literacy gaps globally. Hacker and Van Dijk (2000) explains that the concept of the digital literacy gaps is multifaceted and describes the following types of digital access that bring about inequalities among individuals and groups in society:

Psychological access: This is due to individuals showing no interest in technology or being afraid of digital technology.

Material access: This is where individuals exhibit digital gaps because they have no access to actual digital gadgets. According to Hacker and van Dijk (2000), this is what public opinion and public policy consider to be 'digital literacy'. Many people and institutions do not care to find out what else it takes to achieve digital literacy beyond the provision of gadgets (Muriira, 2020).

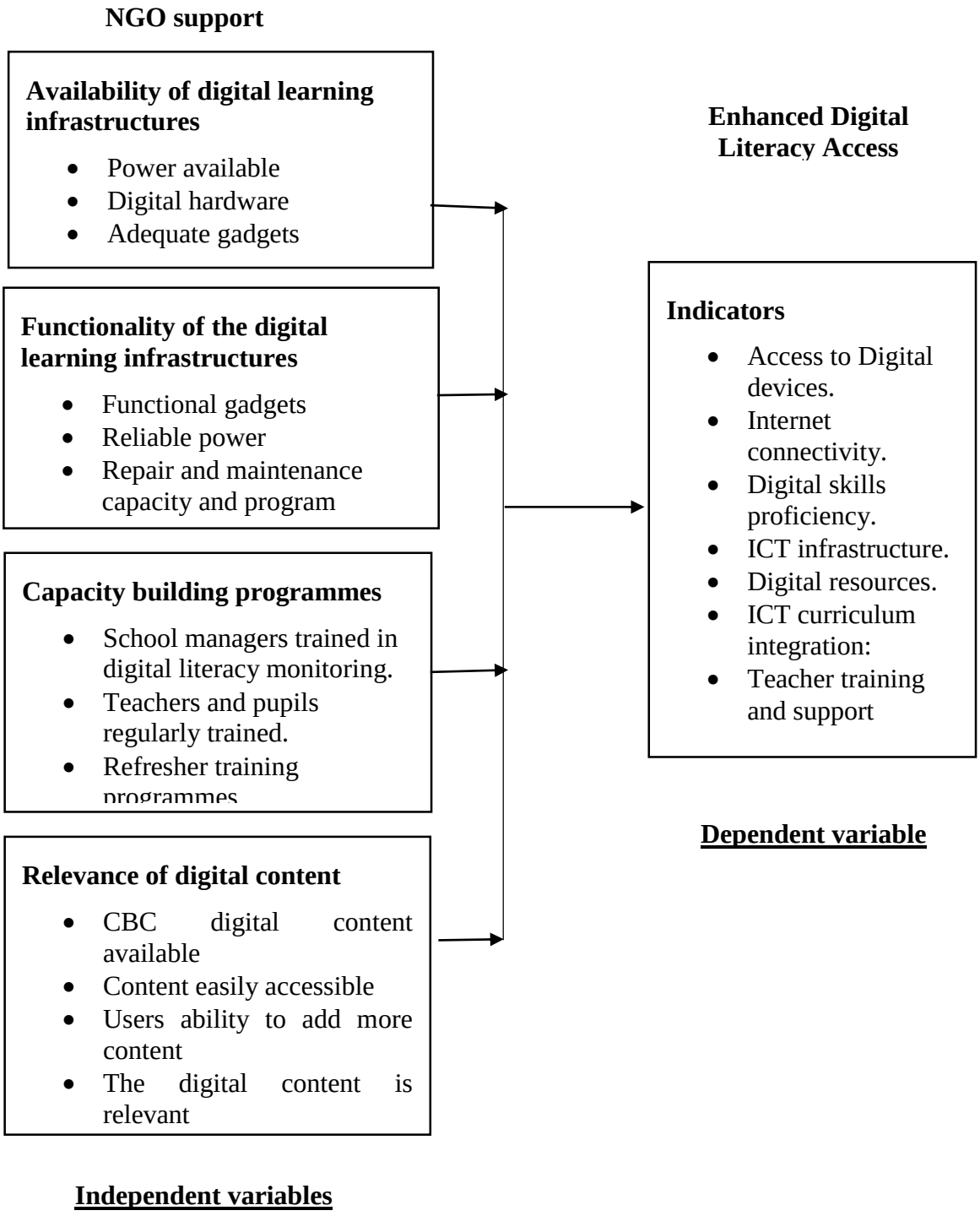
Skills access: Van describes this as an access gap brought about by insufficient training, hence making individuals incapable of being digitally literate.

Usage gap: The theory attributes this gap to a lack of opportunities and platforms for individuals to utilize technology to gain more confidence and access to information.

Using this theory, the researcher collected, analyzed and interpreted data with a clear reference point. The researcher evaluated the contribution of NGOs in reducing these gaps by comparing the levels of access to digital literacy between sponsored schools and those without sponsorship.

Figure 2.1

Conceptual Framework



The conceptual framework shows the relationship that exists between the dependent and the independent variables. DLPs in schools are expected to help teachers and learners gain digital literacy skills, thus reducing the digital gap in the country. This cannot be achieved without provision of gadgets, provision of training programs for teachers to support the implementation and utilize the content, regular maintenance of the available gadgets to ascertain their functionality, and availability of adaptable digital content to encourage use of the gadgets.

When gadgets are available, the material access barrier is broken, and the chance of utilization is there. However, capacity building is needed to break the psychological and use barriers. Teachers need to be trained in the technical skills of handling the gadgets, and regularly refreshed on the same to ensure they gain the confidence and the competence to use the resources. Further, it is expected that every gadget will develop technical problems. Support with the servicing, regular maintenance and repairs is extremely important. Sometimes some gadgets need replacement, and these systems need to be in place to encourage continued use of the gadgets and acquisition of digital skills.

Also, gadgets alone are not enough for acquisition of digital competencies. There needs to be platforms and content accessible to the teachers and learners. It is this content that gives the teachers and learners a reason to regularly access and utilize the gadgets. Relevant and accessible content is expected to encourage use and by extension, digital literacy skills.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter describes the type of research methodology and the rationale for its application. It also describes the research design, location of the study and target population, sampling procedure, sample size, proposed instruments of data collection, operational definition of variables, and the methods of data analysis. The chapter also discusses the ethical procedures applied and explains how the researcher ensured reliability and validity of the research instruments.

3.2 Research Design

This research used deductive reasoning and adopted the descriptive survey research design to explain the situation as far as access to digital literacy is concerned. Descriptive research answers what, who, when, and where type of questions (Grad Coach, 2023). This design was suitable for this research because the researcher described the available digital hardware, the functionality of the available digital hardware and software, digital literacy capacity-building programs, and the availability of relevant digital content in public primary schools.

Descriptive designs are also ideal in comparative studies and allow a researcher to collect quantitative and qualitative data at the same time, allowing for triangulation (Kothari, 2004).

3.3 Location of the Study

The study was conducted in Buuri and Isiolo sub-counties, within Meru and Isiolo counties respectively. The two sub-counties border each other, and they were selected for study because there were no similar studies targeting the area and because it has NGOs investing in digital literacy in public primary schools. The study area also has public primary schools in both hardship and normal zones, and this was necessary to generate non-skewed information on the role of NGOs in reducing the digital literacy gaps in public primary schools.

3.4 Target Population

According to Mugenda & Mugenda (2003), a target population is the population to which a researcher wants to generalize the results of a study. Information gathered from the sub-county directors of both Isiolo and Buuri indicated that the area under investigation has 79 public primary schools. These formed the target population for this study.

The study also targeted the 2,192 Grade 6 learners because this is the senior-most CBC group in primary schools and based on the CBC framework, digital literacy is one of the core competencies that these learners are expected to acquire in primary school. As it was not possible to engage all public primary schools with NGO support in that region in the study, the researcher targeted the 11 public primary schools in Isiolo and Buuri sub-counties with support from the LWC as information gathered from the respective education directors indicated that this is the main NGO sponsoring DLPs in the region under investigation. Information was also gathered from schools in the sub-counties under investigation that do not have NGO support in digital literacy to provide a comparison group.

Headteachers of these schools were targeted in this study because apart from being the policy interpreters and implementers at the school level, they are the school managers charged with the responsibility of ensuring proper curriculum implementation in the schools. It is head teachers who monitor learning and coordinate resource mobilization and utilization in the schools. Therefore, information on digital literacy resources and programs and whether they think the support is helping them achieve digital literacy in their schools was considered very useful in this study.

Every school has a teacher charged with supporting digital literacy in the school, and these too were included in the study. The study also targeted Grades 6 class teachers who helped the researcher understand the capacity of teachers to integrate digital literacy in the curriculum activities and the relevance of the digital content available.

3.5 Sampling Procedure and Sample Size

According to Kothari (2004) sampling is the process of obtaining information about a population by examining a part of it. A sampling procedure refers to the definite plan for obtaining the sample from a sampling frame, where the latter is the list of all items from which the sample is drawn. This study used both probability and non-probability sampling methods. The researcher divided the study area into 2 strata: Buuri West sub-county and Isiolo sub-county.

Table 3.1

Sampling Frame

Sub-county	All schools	Lewa sponsored schools	Headteachers	ICT teachers	Class teachers	Learners
Buuri West	29	5	29	29	29	989
Isiolo	50	6	50	50	50	1203
Total	79	11	79	79	79	2192

In social science research, 10-30% of the target population is the allowed sample size (Mugenda & Mugenda, 2003). The researcher selected 10% of the schools using purposive sampling to select 11 sponsored schools, and simple random sampling to select 5 schools for the comparative group, making the total number of schools studied 16. Purposive sampling was used to select 16 school headteachers, 16 digital literacy support teachers, and 16 Grade 6 class teachers. 15% of the Grade 6 learners were selected from each of the 16 schools. Systematic random sampling was used to select them from the class registers, ensuring 50% gender representation, unless where not possible.

Table 3.2

Sample Size

Sub-county	All Lewa sponsored schools	Comparative sample - 20% of schools (less Lewa Sponsored)	Headteachers (study + comparative)	ICT teachers	Class teachers	Learners (15%)
Buuri West	5	3	8	8	8	148
Isiolo	6	2	8	8	8	181
Total	11	5	16	16	16	329

3.6 Research Instruments

Most of the data was collected using questionnaires due to their capability to collect data from a large sample, allowing the researcher to collect both qualitative and quantitative data (Mugenda & Mugenda, 2003). The questions were a mix of closed-ended and open-ended. They were further divided into 4 sections, a section covering one objective at a time. Each section and objective were introduced and defined in a few sentences.

The researcher preferred questionnaire surveys because they are also easy to administer, and they allow greater uniformity of questions (Kothari, 2004). Williamson (2004) acknowledges that the use of questionnaire surveys helps the researcher achieve reliability because respondents are asked the same questions in the same way, thus minimizing researcher bias. According to MeanThat (2023), researcher bias is any factor

that induces bias in the researchers' recording of responses. When data is collected using questionnaires, the respondents input their responses themselves, increasing their reliability. He also adds that data collected using questionnaires is relatively easy to analyze as most of it is easily coded and is quantitative. The researcher collected data on the gadgets and digital literacy activities undertaken in the schools under investigation, and the respondents' opinions and attitudes. Questionnaires were able to collect this kind of data (Williamson, 2004).

School headteachers were key informants in this investigation, so interview schedules were used to collect in-depth data on the study subject. This would not have been possible using other types of tools. The researcher also used observational schedules to collect data on the digital literacy infrastructures available in the schools. Any other observations noted during data collection that are in line with this research were recorded and quantified where possible.

3.6.1 Pre-testing of the Questionnaires

According to Kothari (2004) pre-testing allows the researcher to get the weaknesses of the questionnaire (if any) and the survey technique in general. Mugenda and Mugenda (2003) state that in pre-testing of a questionnaire, a pretest sample of between 1% and 10% of the study sample is appropriate.

The researcher pre-tested them with 7% of the study sample taken from schools in Laikipia North sub-county. 7% of 16 schools is 1 school and the researcher used simple random sampling to select this. The results were reported. Laikipia North sub-county was found suitable for the pre-testing because it has a population like the study population,

with sponsored public primary schools. It has 29 public primary schools, with 3 sponsored by Lewa.

According to Kiugu (2020), pre-testing the questionnaires helps the researcher address other factors that need prior consideration such as the time needed, clarity of the questions, suitability of the tool and possible obstacles that might be faced in the actual data collection. It also allows the researcher to determine whether the full-scale study can be conducted as planned or whether there are alterations needed.

3.6.2 Validity

The researcher ensured validity of the questionnaire survey by pre-testing it. This was important because there might have been vague questions that might be interpreted differently by the respondents and this would come out clearly after pre-testing, allowing the researcher to rephrase them until they convey the same message to all respondents (Mugenda & Mugenda 2003). Pre-testing also allowed the researcher to ensure that the items in the survey were relevantly informing the measurement of the intended construct of digital literacy.

In taking care of the content validity, the researcher ensured sufficiency of the content in the survey by consulting with experts, supervisors, and previous similar studies. The researcher ensured the instruments have face validity by borrowing from and comparing with instruments validated and applied in similar studies. The questionnaire used by (Kiugu, 2020) highly informed the researcher.

3.6.3 Reliability

The researcher mainly ensured that the research instruments are reliable by using the test re-test method. The questionnaire surveys were given to the pre-test group, and the same repeated with the same group after a week to check for consistency. The results were fed into SPSS for analysis and tested for internal consistency using the Cronbach's alpha coefficient, with the knowledge that a coefficient value above 0.7 is acceptable and shows that the items in the survey are consistently related to each other. analysis revealed a coefficient value of 0.815 and thus was deemed acceptable.

The researcher also ensured the data collected is reliable by using the self-administered questionnaires (Mugenda & Mugenda, 2003). This is where questionnaires are delivered to the respondents (either electronically or physically) and the latter fill in the surveys themselves. This helps remove the bias that would have been caused by the researcher recording the responses. (Oliver, 2021).

To take care of participant bias that may affect the reliability of the responses given, the researcher anonymized the questionnaires and assured the respondents that there would be no personal information collected that would link the responses given to individual respondents. The researcher collected only the biodata that was useful in analysis, such as gender, age, and whether they were in a school that receives NGO support in digital literacy or not.

3.7 Methods of Data Collection

Data was collected from ICT teachers, class teachers and learners using questionnaire surveys. The formulated questionnaires were fed onto Kobo Collect for respondents who

could fill them electronically. Those who could not were given printed forms. This method was most preferred because of its efficiency in collecting large amounts of data at once (Mugenda & Mugenda, 2003). Data was collected from the school headteachers using interview schedules to gather rich and detailed information. Observation schedules were used to record the digital literacy infrastructures in the schools and any other relevant observation.

3.8 Ethical Considerations

The researcher strived to ensure ethical standards in the study. First, upon award of the research letter of introduction by the University, the researcher obtained a research permit from NACOSTI. In addition, the researcher had a cover letter that introduced the research study to the respondents and assured them of the confidentiality to be observed in the research. The letter also clarified that the data collected from the respondents would be used for the research study only and that no other unwarranted persons would have access to it.

The researcher upheld professionalism and confidentiality and ensured that consent is obtained from every single respondent, adhering to the NACOSTI standards and Kenya's Personal Data Protection Act of 2022. This way, the researcher ensured that all participants in the research were doing so voluntarily and that no one was coerced to give information.

In the school set-up, the researcher ensured protocol and rightful channels are used to access respondents. First, the researcher obtained school access rights from the respective MOE sub-county directors. Then she reported to the school head teachers who in turn gave access to the teachers.

As learners are under the care of their teachers, the researcher obtained access to them through their class teachers. And their participation consent was obtained from their class teachers. As part of research ethical practice, the researcher also ensured to thank the respondents at the end of the survey. All the secondary sources used have also been acknowledged using the APA referencing style.

3.9 Operational Definition of Variables

Table 3.3 shows the indicators of the variables in this study and how each was measured. Indicators against all 4 objectives were measured using both quantitative and qualitative approaches, and descriptive and inferential statistics were used in the analysis of the findings.

Table 3.3

Operationalization of Variables

Research objective	**Independent variable indicators**	**Dependent variable indicators**	**Level of measurement**	**Analysis approach**
To assess the availability of digital learning infrastructures in NGO-sponsored and non-sponsored public primary schools in Buuri and Isiolo sub-counties	-Type of DLP gadgets available -Number of the gadgets available against the number of users -Sources of the gadgets available -Number of classrooms with power connection	Increased digital resources enhancing digital literacy.	-Multiple choice surveys for gadgets available and the sources -Ratio for number of gadgets and classroom with power connection	Quantitative /Qualitative
To assess the functionality of digital learning infrastructures	Reliability of the power available Number of functional gadgets out of	Functional gadgets increase ICT integration in learning and	Ordinal scale surveys for the functionality of the gadgets	Quantitative and qualitative

in public primary schools	the total in the school	acquisition of digital skills	and reliability of power	
To assess the DLP capacity-building programs in public primary schools	-Number of headteachers and teachers trained -Number of annual trainings -Availability of on-site trainings -Facilitators of the capacity building forums -How useful the trainings are	Training enhancing ICT use and digital literacy	Nominal data (Yes/No) for training -Ratio data for number of trainings -Nominal data for source of training - Likert scale to test attitude towards capacity building and their relevance	Quantitative and qualitative
To evaluate the relevance of digital content in public primary schools	-Available CBC digital content per subject -Ease of content access	-Relevant digital content increasing content use	-Multiple choice -rating scale	Quantitative qualitative (for remarks on relevance)

	-Content relevance	and acquisition of digital skills

3.10 Methods of Data Analysis

The researcher used descriptive and inferential statistics in the analysis of the quantitative data collected. For the former, the researcher used mean as the measure of central tendency based on its relative stability and its ability to take into consideration every single score in computing the average (Mugenda & Mugenda, 2003). This study used standard deviation to measure dispersion because just like the mean, it takes into consideration all values. It is obtained by subtracting the mean from each score (Mugenda & Mugenda, 2003).

Inferential statistics comprise hypothesis testing techniques that help determine the likelihood of the results obtained from a sample being generalized to the entire population (Mugenda & Mugenda, 2003). The researcher used simple regression analysis to determine whether the independent variables predict the dependent variables (Mugenda & Mugenda, 2003).

The study used SPSS Version 24 as a tool to help with the analysis of quantitative data. Qualitative data was arranged in themes and narrative analysis used to single out quotes relevant to the study's objectives, followed by an explanation of the same. Frequencies and percentages were used to analyze the biodata collected on the respondents.

3.11 Data Analysis and Presentation

For all quantitative data collected either through Kobo, physical forms, and observation checklists, data cleaning was done first, then the clean data was entered into excel (from the physical files) for coding and importing to SPSS for analysis. The data collected through Kobo Collect was downloaded in Excel format and coded before importing the coded file on SPSS for analysis.

The cleaning entailed counting the returned questionnaires and checking for completeness and the response rate. In case of any incomplete ones, they were kept aside but accounted for in Chapter 4 during analysis and reporting. The researcher then developed a coding scheme according to the type of questions used in the survey and this is what guided the assignment of codes to every measure for analysis (Mugenda & Mugenda, 2003).

The researcher also measured variability using standard deviation to describe the dispersion of scores around the mean (Mugenda & Mugenda, 2003). Measuring dispersion in this study was very helpful because it helped the researcher understand how dispersed the scores are for each variable, aiding in the comparison of digital literacy in schools with NGO support and those without. Data was presented using tables, charts and graphs.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter explains and discusses different aspects of the research findings using descriptive and inferential statistics, and qualitative thematic analysis. The discussion is organized in order of the study objectives and refers to other related studies as well. The findings provide significant insights into the disparities between sponsored and non-sponsored schools.

4.2 Reliability Statistics

The fitness for analysis of the data collected was statistically determined using the Cronbach's Alpha coefficient test and the results are as shown on table 4.1

Table 4.1

Cronbach's Alpha Coefficient

Section	Number of Items	Cronbach's Alpha
Grade 6 Class Teachers	4	0.707
Grade 6 Learners	5	0.922
ICT Support Teachers	5	0.817

These results indicate that the Cronbach Alpha coefficient values were above the acceptable 0.7, indicating the reliability of the instruments used in the study.

4.3 Response Rate

Table 4.2

Response rate

Respondent	Frequency			Percentage of Response Rate
	Received Responses	Missing Responses	Total	
Headteachers	16	0	16	100%
ICT teachers	16	0	16	100%
Class teachers	16	0	16	100%
Learners	275	54	329	83.6%
Total	323	54	377	85.7%

16 responses were expected from the head teachers, ICT teachers and class teachers respectively. These 3 groups delivered a 100% response rate as per the table 4.2. Of the 329 responses expected from the learners, 275 were achieved, making it 83.6%. The average response rate from all the respondents was 85.7%.

4.4 Demographic Profiles of the Respondents

The background information relating to the respondents is captured in this section. Data from all participants was collected and analyzed based on the respondents' age, gender, and whether their school was sponsored or not. Then for the teacher respondents, data was collected and analyzed on their employer and years of experience in that role.

4.4.1 Age Bracket

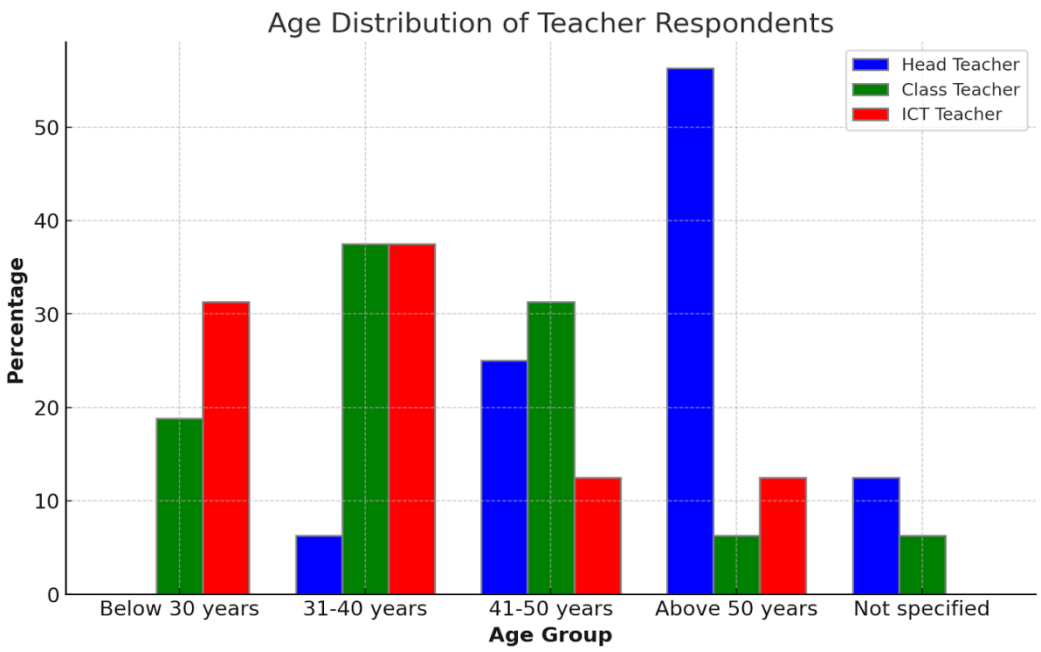
Table 4.3

Age of all teacher respondents

Description	Head Teacher		Class Teacher		ICT Teacher	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Below 30 years	0		3	18.8%	5	31.3%
31-40 years	1	6.3%	6	37.5%	6	37.5%
41-50 years	4	25.0%	5	31.3%	2	12.5%
Above 50 years	9	56.3%	1	6.3%	2	12.5%
Not specified	2	12.5%	1	6.3%	0	0.0%
Total	16	100.0%	16	100.0%	16	100.0%

Figure 4.1

Age distribution of all teacher respondents



A majority of the sampled headteachers are above the age of 50, with 56.3% representing this group, 25% the age of 41-50 years, 6.3% 31-40 years. 13% of the respondents in this category did not answer this question. This data shows that most of the teachers do not get a leadership opportunity early in their career.

Out of the 16 ICT support teachers sampled, those between the age 31-40 years are the majority at 37.5%. 31.3% are below 30 years. Those between 41-50 years and those above 50 years are at 12.5% each. 6.3% did not respond to this question. This shows that this assignment is given to the relatively young teachers, seeing that those below 40 years form 68.8%. This statistic also shows that the young are considered more able to understand and support with digital technology in learning and teaching and is supported by James and Avijit (2016) who argue that personal characteristics such as age influence an individual's ability to understand digital technology. They argue that the young are

more likely to have interacted with modern technology in their day-to-day lives and will therefore be more knowledgeable on its application.

Just like the ICT teachers, 37.5% of the class teachers are aged between 31-40 years and they are the majority in this sample. 31.3% are aged between 41-50 years, 18.8% are below the age of 30 years while 6.3% are above the age of 50 years. Another 6.3% did not specify their age.

Table 4.4

Age Distribution of Learner Respondents

Category	Frequency	Percentage
Below 12 years	104	37.8%
12-13 years	122	44.4%
13-14 years	30	10.9%
Above 14	8	2.9%
Not specified	11	4.0%
Total	275	100.0%

Many of the learners who responded were between the age of 13 and 14 years at 44.4% and 122 in total. Those below 12 years account for 37.8%, with 10.9 % comprising of the group between 13-14. 2.9% are above the age of 14 while 4.0% respondents did not specify their age.

4.4.2 Respondents' Gender

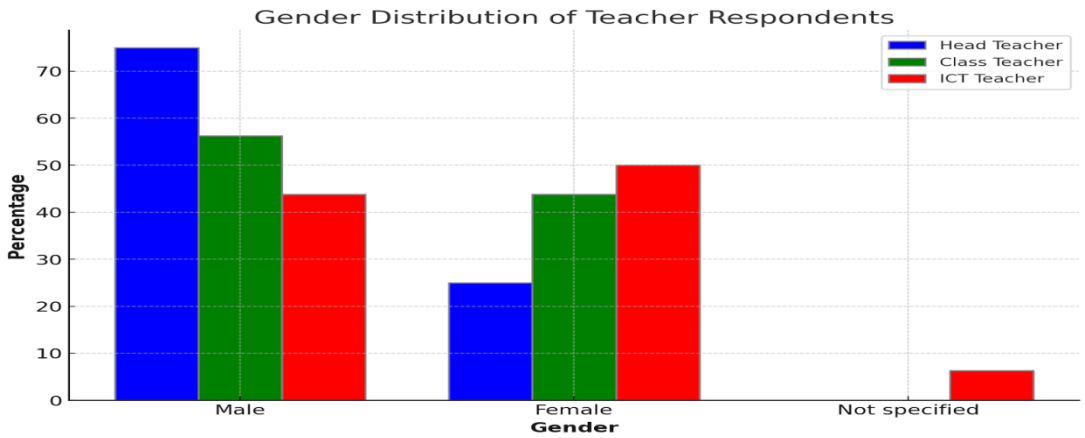
Table 4.5

Gender of all Teacher Respondents

Description	Head Teacher		Class Teacher		ICT Teacher	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Male	12	75.0%	9	56.3%	7	43.8%
Female	4	25.0%	7	43.8%	8	50.0%
Not specified	0	0.0%	0	0	1	6.3%
Total	16	100.0%	16	100.0%	16	100.0%

Figure 4.2

Gender of all Teacher Respondents



75% of the sampled head teachers are male while 25% are female. This shows a gender disparity in the top leadership of the schools, largely favoring the male gender. 56.3% of the class teachers are male with 43.8% being female. This is a relatively balanced distribution.

50.0% if the ICT support teachers who responded to this survey were female, 43.8% were male while a 6.3% did not disclose their gender. This statistic shows a positive effort towards enhancing equity in access to technology globally, with different actors working to ensure women are included and have the opportunities. Having 50% female teachers playing this role in the schools shows that women are gaining the skills and the power to lead in the technology field as well.

Table 4.6

Gender of all Learner Respondents

Category	Frequency	Percentage
Boys	127	46.2%
Girls	148	53.8%
Total	275	100.0%

More girls than boys participated in the study, with the latter forming 53.8% and the former 46.2%. All participants answered this question. While the researcher aimed for an equal representation between the 2 genders, this proved impossible because in some schools the general turns up of learners in Grade 6 had sharp differences, recording more girls and fewer boys. This trend was observed in Isiolo schools and came out in one of the key informant interviews where the respondent alluded to cultural challenges

affecting the school attendance for boys, with some often-missing school to go look after their family livestock.

4.4.3 Sub- County

The location distribution was equal, with 50% of the participant schools being from Isiolo sub-county and 50% from Buuri West. This also applies to head teachers, ICT teachers and class teachers.

Table 4.7

Learner Respondents by Sub- County

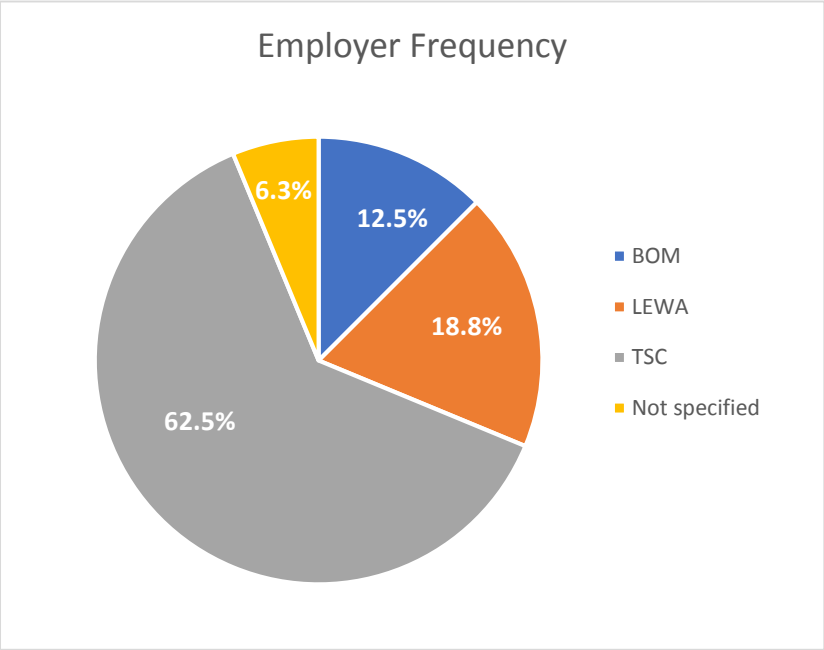
Category	Frequency	Percentage
Buuri West	153	55.6%
Isiolo	103	37.5%
Not specified	19	6.9%
Total	275	100.0%

As for the learners, 55.6% of the respondents were from Buuri sub-county, 37.5% from Isiolo sub-county while 6.9% did not specify their sub-counties.

4.4.4 Employers of all Teacher Respondents

Figure 4.3

Employers of all Teacher Respondents



Of all the 48 teacher respondents, 62.5% are employed by the Teacher Service Commission, 18.8% by Lewa, 12.5% by the school boards and 6.3% did not specify their employer. This shows that many of the teachers in the schools are on permanent and pensionable employment by the TSC. This is good for the study because this category of teachers has received in-service training on the use of digital techniques and teaching.

Table 4.8

Employers of teacher respondents

Description	Head Teacher		Class Teacher		ICT Teacher	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
BOM	0	0.00%	0	0.00%	2	12.50%
LEWA	0	0.00%	0	0.00%	3	18.80%
TSC	16	100.00%	16	100.00%	10	62.50%
Not specified	0	0.00%	0	0.00%	1	6.30%
Total	16	100.00%	16	100.00%	16	100.00%

The data shows that 100% of the class teachers and head teachers sampled are employed by the TSC. As for the ICT support teachers, 62.5% are employed by TSC, 18.8% by Lewa, 12.5% by the school board of management and 6.3% did not answer this question. Lewa has employed 18.8% which shows the organization's commitment to digital literacy, to the extent of supporting the schools with personnel to enable digital integration. Also, this data on employers of ICT support teachers relates to the data on the age of these teachers as it was clear that a majority are young, with 68.8% of them being below the age of 40 years.

4.4.5 Teacher Years of Experience

Table 4.9

Years of Experience of all the Teacher Respondents

Description	Head Teacher		Class Teacher		ICT Teacher	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
0-5 years	5	31.0%	7	43.8%	10	62.5%
6-10 years	3	19.0%	6	37.5%	3	18.8%
11-20 years	6	37.0%	2	100.00%	2	12.5%
Above 20 years	0	0.0%	1	6.3%	0	0.0%
Not specified	2	13.0%	0	0.00%	1	6.30%
Total	16	100.00%	16	100.00%	16	100.00%

Many of the class teachers sampled have below 5 years of teaching experience, at 43.8%. The data shows that 37.5% have taught for 6-10 years, 12.5% for 11-20 years and 6.3% for more than 20 years. This shows that a big number of the teachers in the school are young, which is a good thing for digital literacy because it is expected that younger people will be more comfortable with technology.

Most of the teachers supporting digital learning in the schools have less than 5 years of experience, which again is reflected in the data relating to the age and employers of this category of respondents. Head teachers on the other hand have varying amounts of experience in heading that school, but all have below 20 years of experience.

4.5 The Availability of Digital Learning Infrastructures

The first objective of the study was to assess the availability of digital learning infrastructures in NGO-sponsored and non-sponsored public primary schools in Buuri and Isiolo sub-counties. The indicators to this objective were: available electricity, available digital gadgets and adequacy of the available gadgets.

4.5.1 Classroom quality and Electricity Access

Table 4.10

Grade 6 Learners - Digital Literacy Infrastructures - Sponsored Schools

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
My classroom is built of concrete stones, metal doors and windows.	79.9%	17.5%	2.1%	0.0%	0.5%
My classroom has wiring and power sockets to support use of digital devices	49.5%	26.3%	6.7%	10.3%	7.2%
My classroom has Electricity power from Kenya power	50.0%	21.6%	4.1%	3.6%	20.1%
My classroom has solar powered connection	27.3%	7.2%	1.0%	21.1%	43.3%
We have a safe place to store the digital devices	58.8%	25.3%	10.3%	2.1%	1.0%

Table 4.11

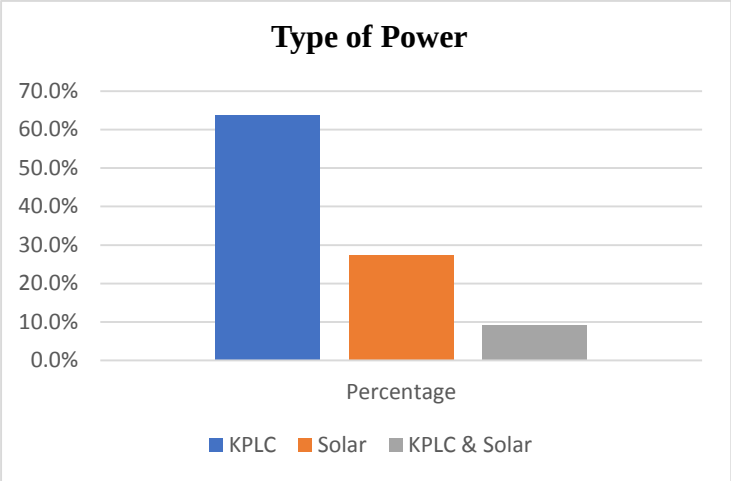
Grade 6 Learners - Digital Literacy Infrastructures - Comparative Schools

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
My classroom is built of concrete stones, metal doors and windows.	62.0%	8.5%	2.8%	4.2%	18.3%
My classroom has wiring and power sockets to support use of digital devices	29.6%	11.3%	2.8%	8.5%	45.1%
My classroom has Electricity power from Kenya power	33.8%	5.6%	1.4%	4.2%	47.9%
My classroom has solar powered connection	18.3%	4.2%	4.2%	9.9%	59.2%
We have a safe place to store the digital devices	45.1%	9.9%	2.8%	8.5%	26.8%

The data shows that 79.9% of learners in sponsored schools strongly agreed that their classrooms were built with robust materials compared to only 62.0% in non-sponsored schools. Additionally, 70.0% of teachers in sponsored schools confirmed these findings strongly agreeing that their classrooms were built of concrete stones with metal doors and windows, compared to 60.0% in non-sponsored schools. This indicates a significant difference in infrastructure quality, with sponsored schools showing better construction (97.4% vs. 70.5%).

Figure 4.4

Type of Electricity Power Available in Schools

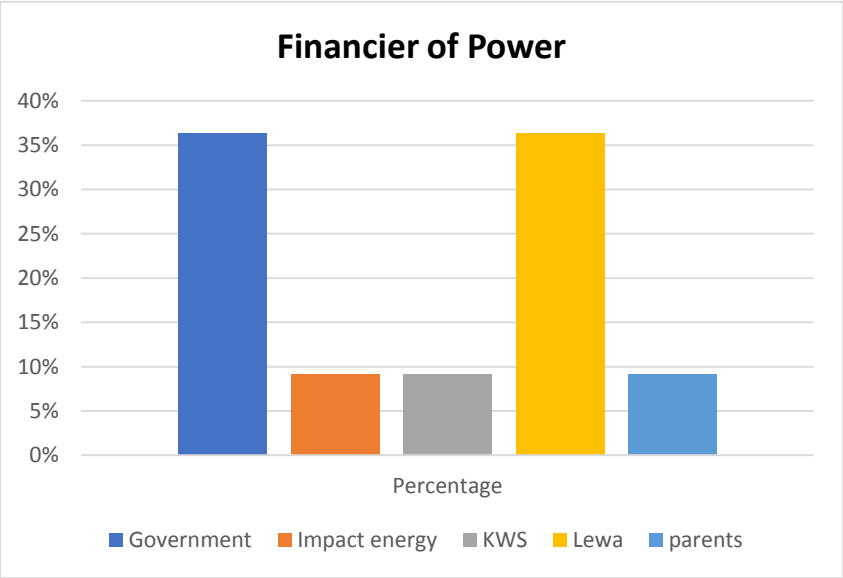


All the 16 schools sampled have access to electricity, and this means that if provided with gadgets and training, they all can attain digital literacy. This compares closely to the report by the Presidential Working Party on Education Reforms (2023) which indicated that 96% of the public primary schools in Kenya had access to electricity. This also indicates the suitability of the sampled schools for the study.

It is observed that all the sampled schools that have solar power are in Isiolo sub-county. Additionally, the availability of wiring and power sockets was significantly higher in sponsored schools, with 75.8% of learners confirming their presence, in contrast to 40.9% in non-sponsored schools. This means that a school could be connected to electricity but lacks the power sockets to enable charging and use of digital gadgets by learners, and that the likelihood of this is higher in non-sponsored schools.

Figure 4.5

Financier of Power Installation



63.6% of the schools have access to mains power from the Kenya Power and Lighting Company, 27.3% to solar power while 9.1% have access to both solar and KPLC. For the schools with KPLC power, connection in 36% of them was funded by the national government, 36% funded by Lewa, 9% by Kenya Wildlife Service, 9% by parents and another 9% by Impact Water. This data indicates that 36% of the connection was funded by the government, 54% funded by private entities and 9% by parents. The data also indicates that all sampled schools with solar power are from Isiolo sub-county. The one school whose installation was funded by KWS is near their camp in Isiolo, so the support came as a Corporate Social Responsibility.

Data collected also shows that out of the 8 schools that have been supported by Lewa with the power installations, 4 of the installations are solar power and 2 are in areas that do not have the national grid yet. This shows the NGOs' commitment to digital literacy

in public primary schools, ensuring that even schools out of the national grid reach have solar power.

The head teachers of all the sampled schools indicated that they have a DLP and that their Grade 6 learners and teachers had access to it. All the 16 schools also indicated that that have safe storage for the gadgets, with solutions ranging from strong rooms, metal boxes and metal cabinets. The schools with NGO support indicated having gadgets from both the government and the NGO.

This data indicates that all sampled schools, both sponsored and non-sponsored, have some level of access to digital literacy, and that all have material access to resources that would otherwise render them incapable of attaining digital literacy. The presence of strong classrooms, electricity and digital gadgets

4.5.2 Access to Digital Learning Gadgets

Data collected from the 16 schools indicates that there are various digital gadgets available to the schools for digital learning. The data also shows that all 16 schools have some gadgets. The gadgets are interactive smart boards, desktop computers, content servers, television screens, laptops, tablets and projectors.

Table 4.12

Number of Digital Gadgets in the schools

Devices	Sponsored			Comparative		
	Lewa	GoK	Total	Parents & Others	GoK	Total
Smartboards	28		28	0	0	0
Desktops	18		18	1	0	1
Laptops	20	14	34	3	8	11
Tablets	397	339	736	0	168	168
Content servers	2		2	0	0	0
Projectors	2	4	6	0	2	2
TV screens	0		0	1	0	1

Data collected from the headteachers indicated that the 11 sponsored schools in the sample have 28 interactive smart boards, 736 tablets, 18 desktop computers, 27 laptops, 2 content servers, 6 projectors. The 5 schools in the comparative sample recorded the following: 1 TV screen, 2 projectors, 11 laptops, 168 tablets, and 1 desktop computer. This data shows that schools that are sponsored have more gadgets and that they have a variety of gadgets, with data showing gadgets like interactive smart boards, desktop computers and independent digital content servers are present only in the sponsored schools.

Smartboards show some usage in the sponsored category but none in the non-sponsored category. This indicates that smartboards are more likely to be provided through private sponsorship rather than independently acquired or provided by the government. Most of

the devices are provided by Lewa (56.7%), with GoK providing the remaining 43.3%. No devices are sponsored by Parents & Others in this category.

Projectors have minimal usage, with a slightly higher percentage in the non-sponsored category. This indicates limited reliance on them especially in the sponsored schools. Data gathered from the interview with one of the headteachers of the sponsored schools indicated that the sponsor used to supply them with projectors but stopped that after observation that teachers would spend so much lesson time trying to set up the projection, with occasional technical hitches (such as misplaced cables) causing further delays and waste of lesson time. The respondent explained that it is these challenges that prompted the NGO sponsor to change the support model from projectors to interactive smart boards fixed in the classrooms that are just a power on, power off solution.

Servers have a negligible presence in the schools, with only two of the sponsored schools equipped with them, and none in the non-sponsored schools. The interview with the headteachers of the 2 schools with the servers indicated that these storage gadgets are a new addition that the sponsor had introduced in the schools to support with storage of the massive CBC content that is rich with videos and pictures and can no longer fit in the smartboard servers. This explains the small number of servers noted in the study but indicates that sponsored schools are getting more advanced in terms of access to sophisticated digital literacy support, in comparison with the non-sponsored.

The researcher further went ahead to analyze the data based on the entity that provided the gadgets to the school and the findings are presented in Table 4.13:

Table 4.13

Do Grade 6 learners use digital gadgets in their classrooms?

	Sponsored		Comparative		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
I don't know	0	0.0%	1	0.4%	1	0.4%
No	1	0.4%	70	26.4%	71	26.8%
Yes	193	72.8%		0.0%	193	72.8%
Grand Total	194	73.2%	71	26.8%	265	100.0%

Data collected from the learners indicated that 72.8% of the learners in the sponsored schools use digital gadgets in the classroom, and that none of their counterparts in the comparative sample has the same privilege. Of the 71 learners in the comparative sample who responded to this question, 70 indicated that they do not have access to these gadgets in their classrooms. This points to increased access to digital literacy in sponsored schools, with frequency of access being higher there than in the non-sponsored schools.

The researcher observed that while in the sponsored schools the devices were mainly stationed in the classrooms, the same was not the case in non-sponsored schools as many had the gadgets in the headteachers' offices. The researcher observed that in sponsored schools, interactive smart boards were fixed in the classrooms making it possible for the learners in that classroom to access and utilize the gadget any time. However, it was noted that the smart boards were not available to all Grade 6 classrooms because in some schools the gadgets were in other grades in Upper Primary or junior secondary classrooms. The researcher also noted that learners had access to tablets in their

classrooms and the schools had digital literacy prefects who would go get the tablets from the storage and distribute them among learners.

The researcher also sought to find out how often the Grade 6 learners get access to digital devices available to them as per the below analysis of the findings:

Table 4.14

Digital Devices Usage Frequency Among Grade 6 Learners

	Sponsored		Comparative		Total	
Details	Frequency	Percent	Frequency	Percent	Frequency	Percent
Never	11	5.7%	59	83.1%	70	26.4%
Less than once a week	30	15.5%	6	8.5%	36	13.6%
1 - 3 times a week	70	36.1%	3	4.2%	73	27.5%
3 - 6 times a week	14	7.2%	0	0.0%	14	5.3%
Everyday	69	35.6%	2	2.8%	71	26.8%
No response	0	0.0%	1	1.4%	1	0.4%
Total	194	100.0%	71	100.0%	265	100.0%

The data collected shows that the frequency of digital gadgets use is way higher in sponsored schools. 35.6% of the respondents in the sponsored schools said that they use the gadgets every day, with 2.8% of their counterparts in the non-sponsored schools being of the same view. 5.7% of the respondents in the sponsored schools said that they never

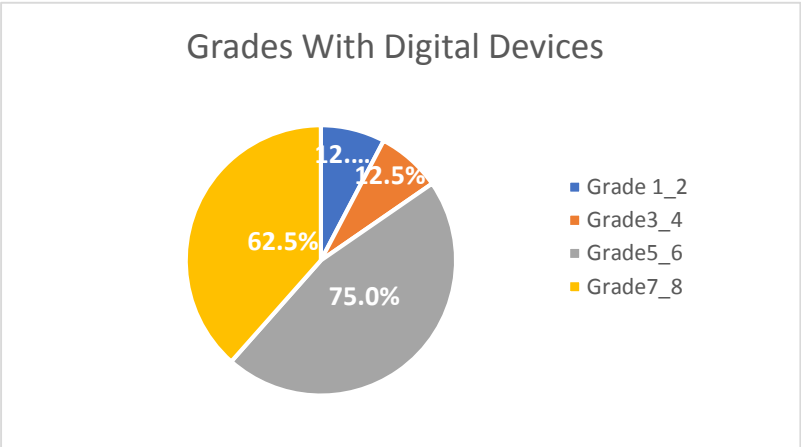
use digital gadgets in their classrooms, with 83.1% of their counterparts in the non-sponsored schools holding the same view.

This analysis shows that learners attending sponsored schools have more interaction with digital gadgets in their classrooms as compared to those in non-sponsored schools. This, according to the data collected, is attributed to the presence of digital gadgets within the classroom, which makes it possible and easy for learners to access and utilize the devices, under supervision of the teachers and on their own. This exposure contributes directly to their acquisition of digital skills and their ultimate preparation for the digital world. Having more interaction with the gadgets also removes the psychological barriers, commonly known as technological phobia, among learners and teachers and promotes their acquisition of digital skills.

The researcher also collected and analyzed data in relation to the distribution of the gadgets available within the school to understand what grades had more access than the others. The results are presented on figure 4.6

Figure 4.6

Grades with access to digital devices



Data from the ICT support teachers indicated that Grades 5 and 6 had most access to the gadgets, followed by grades 7 and 8 and the lower grades were ranked last. This also came out from 86% of the headteachers interviewed who cited inadequate gadgets as one of the main challenges they face in enhancing proper implementation of the CBC framework and said that they had to prioritize the upper primary learners because the curriculum is more heavily reliant on technology in those grades. This also resonates with Omito (2020) whose study found that 89% of the sampled schools did not have adequate digital learning resources.

4.5.3 Access to the Internet

The research revealed that 4 out 5 schools- 80% - in the comparative sample have access to the internet. Of the 4, 3 were supported by other sponsors to install the internet and 1 is still supported with the monthly subscriptions. 45% of the sampled sponsored schools have access to Wi-Fi, with 60% of the installations funded and maintained by Lewa. However, interviews with the headteachers of the sponsored schools indicated that Wi-Fi installation was not a priority for them because the sponsor had provided digital content in an offline platform that did not require any internet. The interviews further indicated that there was a challenge in managing the use of the gadgets in schools that had access to Wi-Fi because often learners and teachers accessed online content that was outside of the learning needs hence being a distraction to the learning process. They cited challenges with learner discipline too, with claims of learners accessing cites with little educational value coming out.

4.5.4 Access to Devices

Table 4.15

Grade 6 Learners - Access to Devices in Sponsored Schools

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Learners can access Tablets and digital Learning devices anytime	27.3%	30.4 %	15.5%	9.3%	16.5%
Teachers can access Tablets and digital Learning devices anytime	41.8%	32.5 %	7.7%	5.7%	11.9%
I can access the digital devices anytime I need to use them	25.8%	24.7 %	21.6%	10.8%	16.0%
Digital devices available support audio and video content	52.6%	32.0 %	6.7%	2.6%	5.2%

Table 4.16

Grade 6 Learners - Access to Devices in Comparative Schools

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Learners can access Tablets and digital Learning devices anytime	15.5%	16.9%	7.0%	14.1%	45.1%
Teachers can access Tablets and digital Learning devices anytime	28.2%	15.5%	2.8%	11.3%	39.4%
I can access the digital devices anytime I need to use them	14.1%	16.9%	5.6%	16.9%	43.7%
Digital devices available support audio and video content	25.4%	15.5%	7.0%	8.5%	38.0%

The opinions of the learners also show that devices in sponsored schools have better and higher functionality, accessibility and usability. For instance, 25.8% of learners in sponsored schools strongly agreed they had access to digital gadgets anytime, compared to only 14.1% in non-sponsored schools. 41.8% of the learners in sponsored schools strongly agreed that their teachers could access the devices any time, with 28.2% of their counterparts in the non-sponsored schools being of the same view. This shows that in both sponsored and non-sponsored schools, teachers have more access to the devices than learners. This might be because the devices are stored in the offices, and it is teachers who decide whether and when to avail the devices to the learners.

Table 4.17

Descriptive Statistics for Available of Digital Learning Infrastructure

Infrastructure	Frequency	Mean	Standard Deviation
Classroom Wiring (NGO)	194	0.8	0.35
Classroom Wiring (Non-NGO)	194	0.5	0.35
Electricity (NGO)	194	0.9	0.41
Electricity (Non-NGO)	194	0.6	0.41

The availability of digital learning infrastructures in public primary schools, particularly those sponsored by NGOs, demonstrates a significant impact. Key infrastructures such as classroom wiring, electricity, solar-powered classrooms, and safe device storage were assessed. The descriptive analysis reveals that the mean access level for classroom wiring and electricity in NGO-sponsored schools is around 0.8 and 0.9, respectively, compared to 0.5 and 0.6 in non-sponsored schools. The standard deviation values of 0.35 and 0.41 indicate moderate variability in these infrastructures' availability among schools. This suggests that NGO-sponsored schools are better equipped with essential digital learning infrastructures, providing a more conducive environment for digital literacy. The higher mean values and lower variability in NGO-sponsored schools highlight the positive influence of NGO interventions in reducing the digital divide.

4.5.5 Qualitative Analysis

Headteachers from NGO-sponsored schools highlighted the crucial role of NGOs in providing and maintaining digital infrastructures. They noted that without NGO support, their schools would struggle to meet digital literacy goals due to limited governmental support. Specifically,

Respondent F: *"The digital infrastructure provided by NGOs has been crucial for our school's digital literacy programs. Without their support, we would not have been able to meet our goals."*

Respondent G: *"Our school lacks many digital devices that NGO-sponsored schools have. This disparity makes it challenging to offer the same quality of digital education."* This finding is further supported by that of Kiugu (2020)

Access to digital resources and facilities is key in enhancing the acquisition of digital literacy skills and overcoming material access barriers. Schools with sponsors have increased access to these resources and are even able to interact with the technological resources without the need for the internet because the sponsor has invested in technology that does not need internet access. Most of the non-sponsored schools have access to the internet but still the facilities and resources available are not easily accessible to the learners and teachers. The internet is mostly used for administrative purposes, with headteachers commenting they must have access to it because the TSC and MOE require them to submit so much data online. They do not report so much use of the internet for learning purposes, citing other challenges like insufficient devices, faulty learner devices and lack of digital content. This means that the availability of the internet in public primary schools does not necessarily contribute to acquisition of digital skills among learners and teachers.

4.5.6 Hypothesis results on Availability of Digital Learning Infrastructure

Regression analysis was used to determine whether there is a significant difference in the availability of digital learning infrastructures between schools with NGO support and those without.

Regression Model: Enhanced Digital Literacy Access = β0 + β1 × Availability of Digital Learning Infrastructures + ϵ

Table 4.18

Regression Variables – Objective I

Variable	Sponsored β	Sponsored p	Non-Sponsored β	Non-Sponsored p
Power Availability	0.50	0.01	0.35	0.05
Digital Hardware	0.40	0.01	0.30	0.05
Adequate Gadgets	0.30	0.05	0.20	0.10

In examining the availability of digital learning infrastructures, it was found that power availability significantly impacts digital literacy access in NGO-sponsored schools, with a beta coefficient (β) of 0.50 and a p-value of 0.01. This indicates a highly significant relationship. In contrast, non-sponsored schools also show a significant impact of power availability on digital literacy access, but to a lesser extent (β = 0.35, p = 0.05).

For digital hardware, NGO-sponsored schools demonstrate a strong influence on digital literacy access (β = 0.40, p = 0.01), while non-sponsored schools also display a significant influence, though slightly less robust (β = 0.30, p = 0.05). Adequate gadgets have a positive effect in sponsored schools (β = 0.30, p = 0.05), whereas in non-sponsored schools, the effect is minimal and not significant (β = 0.20, p = 0.10).

The first hypothesis (H01) stated that there is no significant difference in digital learning infrastructure between public primary schools with NGO sponsorship and those without the sponsorship. The data clearly indicates significant differences in favor of NGO-sponsored schools across multiple measures of digital learning infrastructure. Sponsored schools consistently reported higher levels of infrastructure availability, including classroom robustness, wiring and power sockets, electricity supply, solar power, safe storage for digital devices, and the devices themselves.

The P values for the indicators in the sponsored schools meet the threshold of less than or equal to 0.05 indicating a significant difference and supporting the rejection of the null hypothesis. The values are above 0.05 in the non-sponsored schools.

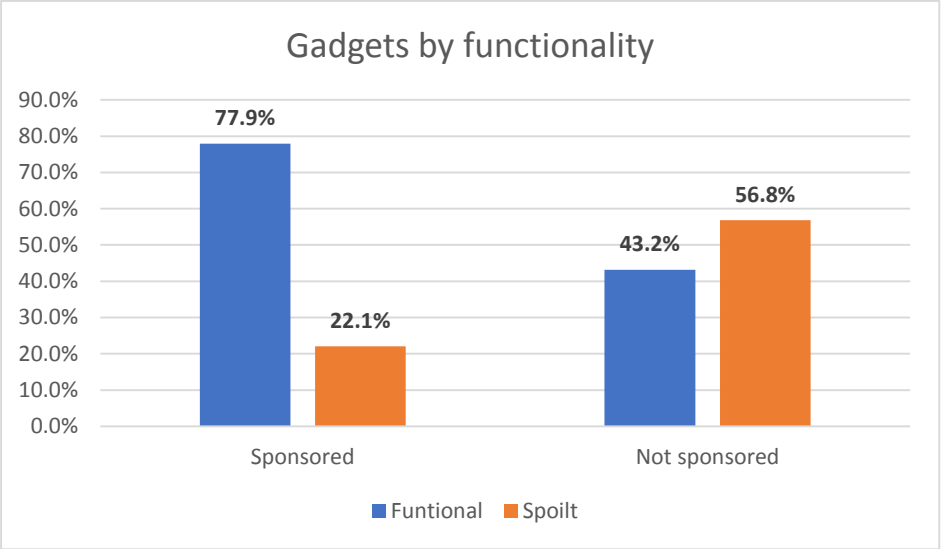
Therefore, H01 can be rejected, indicating that there is indeed a significant difference in the availability of digital learning infrastructure between NGO-sponsored and non-sponsored public primary schools. This finding underscores the positive impact of NGO sponsorship on enhancing the digital learning environment in these schools.

4.6 The Functionality of Digital Learning Infrastructures

It is one thing to have access to the gadgets and another to have them functional. The second objective of this study was to establish the functionality status of the digital gadgets available in schools for teaching and learning. The indicators covered under this objective are functional digital gadgets, reliable power, and repair and maintenance programs, all from a comparative perspective.

Figure 4.7

All Gadgets by Functionality



Data collected and analyzed indicated that a high percentage of the devices in sponsored schools (77.9%) are functional, indicating good maintenance and usability, with 22.1% being dysfunctional. In the non-sponsored schools, 43.2% of the gadgets there are functional while 56.8% remain dysfunctional. The spoilt rate of 22.1% in the sponsored schools, while not negligible, is relatively low compared to the non-sponsored category.

Table 4.19

Functionality Distribution

Devices	Sponsored					Not sponsored				
	Lewa	GoK	Total	Functional	Spoilt	Parents & Others	GoK	Total	Functional	Spoilt
Smartboards	28		28	28	0	0	0	0	0	0
Desktops	18		18	16	2	1	0	1	1	0
Laptops	20	14	34	23	11	3	8	11	9	2
Tablets	397	339	736	568	168	0	168	168	66	102
Content servers	2		2	2	0	0	0	0	0	0
Projectors	2	4	6	5	1	0	2	2	2	0
TV screens	0		0	0	0	1	0	1	1	0
Total	467	357	824	642	182	5	178	183	79	104

The data gathered from head teachers indicated that in all the 16 schools sampled, the functional gadgets are: 100% of the smart boards, 89% of the desktop computers, 65% of the laptops, 59% of the tablets, 100% of the servers, 88% of the projectors, and 100% of the TV screens. This indicates an average functionality of 73.1%.

The functionality status of the gadgets other than those with 100% functionality varies between the sponsored and non-sponsored schools. In the sponsored schools, 68% of the laptops available are functional, with 90% of these being those provided by Lewa. 77% of all tablets available in the 11 sponsored schools are functional, with 100% of those provided by Lewa being functional and 49.3% of the 339 provided by the government of Kenya being still functional.

These findings are in contrast with those of Kiugu (2020) that indicated a high functionality of the tablets provided by the government, with 89% of the headteachers of the sampled schools confirming that the devices were fully functional. This indicates that more devices have continued to get spoilt with no repairs and/or replacement done. Digital gadgets and all electronics cannot continue to be useable forever. They all have a lifespan, and this lifespan was not defined. It is therefore impractical to continue to expect digital devices that have remained in schools for more than eight years to still be fully functional.

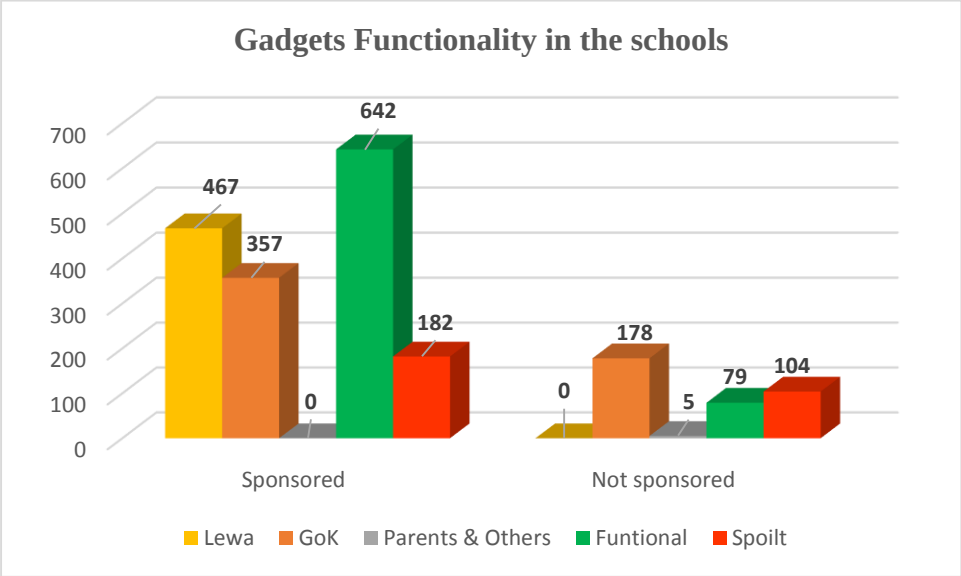
Data collected also indicated a high functionality rate of the projectors, with 83% of the 6 available being functional. In the schools forming the comparative sample of this study, 100% of the TV screens, projectors and desktop computers available are functional. 54.5% of the laptops are also functional while 39.2% of the tablets are functional. This analysis indicates that a critical role is played by NGOs in the maintenance and servicing of gadgets in schools. It also indicates that NGOs are providing high-quality gadgets hence a high number of functional devices.

The researcher also concludes that mobile digital gadgets that can be easily used for other purposes get easily spoilt as the data on tablets and laptops that are not functional. The

indicates the possibility of this category of gadgets being exposed to abuse and diversion of purpose. This also came out from the key informants with two headteachers highlighting the challenge of controlling the personal use of tablets and laptops by teachers and learners. This exposes the gadgets to more damage. The desktop computers, smartboards, projectors and TVs are less damaged because they cannot easily be moved about, and their use is by default more restricted.

Figure 4.8

Gadgets Functionality in the schools



There are more functional gadgets than there are the spoilt ones in sponsored schools, and this reflects the increased access to digital skills acquisition within these schools. The non-sponsored schools have more spoilt devices than the useable ones and this again reflects on wider access gaps present in these schools, indicating minimal access to digital literacy.

In terms of the content the learners can access with the devices, 84.6% of the learners in sponsored schools agreed that the devices available to them can support both audio and

video content. Only 40.9% of their counterparts in the non-sponsored schools were of the same opinion. This shows that the gadgets in the sponsored schools can support a variety of contents and allow more interactivity between the content and the users.

The condition of digital gadgets was also reported to be better in sponsored schools, with 61.3% of learners strongly agreeing that the gadgets were in good condition, while only 40.8% reported the same in non-sponsored schools. Data gathered from the ICT support teachers indicate that 60% of the respondents agree that the gadgets available to them and their learners are functional. 20% have a neutral opinion while another 20% disagree. In both sponsored and non-sponsored schools, learners agreed that teachers had more access to the devices than learners.

Table 4.20

Descriptive Statistics for Gadget Functionality

Metric	Frequency	Mean	Standard Deviation
Reliability (NGO)	194	0.8	0.1
Reliability (Non-NGO)	194	0.6	0.1
Absence of Hanging Issues (NGO)	194	0.7	0.1
Absence of Hanging Issues (Non-NGO)	194	0.5	0.1
Maintenance Plans (NGO)	194	0.6	0.2
Maintenance Plans (Non-NGO)	194	0.5	0.2
Regular Updates (NGO)	194	0.6	0.2
Regular Updates (Non-NGO)	194	0.5	0.2

The functionality of digital learning infrastructures is critical for effective teaching and learning. The data reveals that digital devices in NGO-sponsored schools are more reliable and less prone to hanging issues, with mean functionality scores of 0.8 for reliability and 0.7 for the absence of hanging issues. In comparison, non-sponsored schools have mean scores of 0.6 and 0.5, respectively. The standard deviations for these scores are relatively low, indicating consistent functionality across schools. However, maintenance plans and regular updates of digital gadgets are less consistently available, with mean scores around 0.6 and 0.5 in NGO-sponsored schools. This highlights the need for more structured maintenance programs to ensure sustained functionality. Overall, the higher mean functionality scores in NGO-sponsored schools underscore the benefits of continuous technical support and updates provided by these organizations.

4.6.1 Qualitative Analysis

Headteachers expressed concerns over the maintenance of digital devices. In NGO-sponsored schools, regular maintenance programs helped ensure functionality. In contrast, non-sponsored schools struggled with device breakdown and lack of technical support, hindering effective digital learning. The maintenance was financed by both the schools and the sponsoring NGO.

> ***Respondent H:*** *"Regular maintenance provided by NGOs ensures that our digital devices remain functional. Without this support, we would face significant challenges in keeping the devices operational."*

> ***Respondent E:*** *"Many of our devices are often broken and we lack the technical support to repair them, which disrupts our digital literacy programs."*

> ***Respondent I:*** *We have had challenges getting spares to fix the spoilt gadgets as they are not readily available on the market, hence making it impossible to get new spare parts.*

Repair and maintenance programs are very key in sustaining DLPs in these schools. Headteachers do not possess any technical capacity to do this, and neither do the teachers because their training is different. Being public schools, they are guided by the Basic Education Act and other laws governing the management of public primary schools. Omito (2020) reports in her study that headteachers find it challenging sustaining the program because the government has not provided any technical capacity to do this, and they are not mandated by the law to employ staff to handle such. They also do not have the resources to invest in the employment of such staff because the MOE has provided guidelines on the teaching and support staff to be employed in a school and where their salaries should come from.

As a result, digital literacy remains a challenging skill for schools to support without external partners' intervention. This study found absence of technical capacity to support with repairs and maintenance in the non-sponsored schools, and some level of support in the sponsored schools.

4.6.2 Hypothesis Results on the Functionality of Digital Learning Infrastructures

Regression analysis was used to determine whether there is a significant difference in the functionality of digital learning infrastructures between schools with NGO support and those without.

Regression Model: Enhanced Digital Literacy Access = $\beta 0 + \beta 1 \times$ Functionality of Digital Learning Infrastructures + ϵ

Table 4.21

Regression Analysis for Functionality of Digital Learning Infrastructures

Variable	Sponsored β	Sponsored p	Non-Sponsored β	Non-Sponsored p
Functional Gadgets	0.55	0.01	0.4	0.05
Reliable Power	0.45	0.01	0.3	0.1
Repair and Maintenance	0.35	0.05	0.25	0.1

Regarding the functionality of digital learning infrastructures, the presence of functional gadgets in NGO-sponsored schools has a strong impact on digital literacy access ($\beta = 0.55$, $p = 0.01$). In non-sponsored schools, functional gadgets have a moderate impact ($\beta = 0.40$, $p = 0.05$). Reliable power in sponsored schools significantly influences digital literacy access ($\beta = 0.45$, $p = 0.01$), whereas in non-sponsored schools, the influence is minimal and marginally significant ($\beta = 0.30$, $p = 0.10$). The ability to repair and maintain these infrastructures shows a positive effect in sponsored schools ($\beta = 0.35$, $p = 0.05$) and a limited effect in non-sponsored schools ($\beta = 0.25$, $p = 0.10$).

The second hypothesis stated that there is no significant difference in the functionality of the digital learning infrastructures between public primary schools with NGO sponsorship and those without the sponsorship. The data indicates significant differences in the functionality of digital learning infrastructures between NGO-sponsored and non-sponsored schools. Sponsored schools consistently reported higher functionality,

including better and more frequent access to digital gadgets, better condition of devices, more reliable electricity, and higher effectiveness of the devices.

Therefore, H02 can be rejected, indicating a significant difference in the functionality of digital learning infrastructures between NGO-sponsored and non-sponsored public primary schools. Sponsored schools demonstrated better functionality, reflected in higher access, better condition, and more effective use of digital devices.

4.7 The Availability of DLP Capacity-Building Programs

The third objective of this study was to assess the digital literacy capacity building programs in public primary schools. The researcher focused on the following indicators: teachers' ability to integrate digital methods in teaching, teachers' and learners' ability to operate the gadgets available to them, training programs available in the schools, retraining programs available in the schools, repair and maintenance programs available, technical support available to the schools.

Table 4.22

Grade 6 Learners - Capacity Building in Sponsored Schools

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I have been trained on how to access and use the digital gadgets	51.0%	35.6 %	4.6%	6.2%	2.6%
My training helped improve my digital literacy skills	51.5%	37.6 %	4.1%	5.7%	1.0%
I am trained on basic maintenance of the gadgets	34.5%	40.7 %	13.4%	4.6%	5.7%
Our teachers need more training to use digital learning platforms to teach better.	39.2%	35.1 %	10.3%	8.8%	5.7%
Exposure to digital learning has helped me to use technology at home.	50.0%	39.7 %	4.6%	2.1%	3.1%
I can train new learnerss who join our school	39.7%	36.1 %	9.3%	6.2%	4.6%
I can train new teachers who join our school	34.5%	32.5 %	6.7%	10.8%	8.2%
My teachers are well trained and able to use the gadgets	40.2%	34.0 %	11.3%	2.6%	4.1%
I would like to pursue a career in technology when I grow older	59.3%	24.7 %	4.1%	2.6%	3.1%

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I can identify and correct minor problems with the devices whenever they have an issue	37.1%	19.6 %	14.4%	19.1%	8.8%
There is someone who can offer help if the gadget has an issue that I cannot address	49.0%	37.6 %	5.7%	4.1%	2.1%
I can access gadgets and digital materials with ease	33.5%	29.9 %	11.3%	15.5%	8.2%
I can Reset my passwords when necessary	33.0%	16.0 %	9.3%	22.7%	17.5%
Teachers can monitor what we are doing with the gadgets	47.9%	31.4 %	9.3%	6.7%	2.6%

Table 4.23

Grade 6 Learners - Capacity Building - Comparative Schools

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I have been trained on how to access and use the digital gadgets	19.7%	14.1 %	15.5%	9.9%	38.0%
My training helped improve my digital literacy skills	28.2%	15.5 %	14.1%	8.5%	29.6%
I am trained on basic maintenance of the gadgets	19.7%	11.3 %	14.1%	7.0%	45.1%
Our teachers need more training to use digital learning platforms to teach better.	29.6%	11.3 %	31.0%	7.0%	18.3%
Exposure to digital learning has helped me to use technology at home.	33.8%	9.9%	14.1%	7.0%	31.0%
I can train new learners who join our school	19.7%	16.9 %	11.3%	8.5%	31.0%
I can train new teachers who join our school	12.7%	11.3 %	16.9%	7.0%	38.0%
My teachers are well trained and able to use the gadgets	32.4%	8.5%	25.4%	7.0%	5.6%
I would like to pursue a career in technology when I grow up	57.7%	12.7 %	9.9%	4.2%	2.8%

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Identify and correct minor problems with the devices whenever they have an issue	21.1%	12.7 %	15.5%	7.0%	39.4%
There is someone who can offer help if the gadget has an issue that I cannot address	39.4%	12.7 %	12.7%	5.6%	26.8%
I can access gadgets and digital materials with ease	11.3%	11.3 %	26.8%	11.3%	36.6%
I can Reset my passwords when necessary	21.1%	9.9%	16.9%	15.5%	33.8%
Teachers can monitor what we are doing with the gadgets	36.6%	11.3 %	15.5%	7.0%	25.4%

This analysis shows that learners in sponsored schools have received more training and can utilize devices to practice various skills as opposed to their peers in the non-sponsored schools. For instance, 86.6% of the learners in sponsored schools are confident that they are trained to access and use digital gadgets. This number is lower in non-sponsored schools because only 33.8% have the same confidence. This shows that NGO sponsorship has helped break access barriers in their sponsored schools by facilitating the training needed to ensure learners can utilize the technology available.

The data also indicates that learners attending sponsored schools are more enabled to apply the digital skills acquired in school back at home. For instance, 89.6% of the learners in these schools indicated that the exposure received in school has enabled them to utilize the devices they have access to at home well. In the non-sponsored schools,

only 43.7% of the respondents indicated the same. This shows that learners attending sponsored schools are much more likely to fit in the 21st century digital world and contribute positively to the digital economy as opposed to those in the non-sponsored schools.

In terms of passing on the skills they acquire, 75.8% and 67% of the learners in the sponsored schools indicated that they could train new learners and teachers who join their schools respectively. In the non-sponsored schools, this number went down to 36.6% and 24% respectively. This data indicates that there is more continuity in the sponsored schools and learners attending these schools are much more likely to share the skills with others and contribute towards making the country and the world a digital literate world.

84% of the sampled learners attending sponsored schools indicated that they would like to pursue a career in digital technology. In the non-sponsored schools, 70.4% of the learners indicated the same, showing that despite their relatively low access to digital technology, they have a keen interest in the field. This shows that there is so much hope for these learners and that they already have a good attitude towards technology.

51.5% of the learners in sponsored schools strongly agreed that the training improved their digital literacy skills. This was lower in the comparative schools, with only 28.2% strongly agreeing and 29.6% strongly disagreeing. Both the learners in the sponsored and non-sponsored schools agree that their teachers need more training. This shows that the learners can observe gaps in their teachers and appreciate that more training is needed to make them more proficient and make their learning better.

Table 4.24

Digital Learning Training for Class teachers

	Sponsored		Comparative		Total
	Frequency	Percent	Frequency	Percent	Frequency
No	0	0.0%	4	80.0%	4
Yes	11	100.0%	1	20.0%	12
Grand Total	11	100.0%	5	100.0%	16

100% of the class teachers in the sponsored schools agree that they have received digital literacy training, compared to 20% of the class teachers in the non-sponsored schools. This shows that the NGO sponsorship has been instrumental in facilitating the training of the Grade 6 class teachers, and that in the sponsored schools, even teachers who are not under TSC employment have received the training from the sponsors.

Table 4.25

Digital Learning Training for ICT Teachers

	Sponsored		Comparative		Total
	Frequency	Percent	Frequency	Percent	Frequency
No	1	9.1%	4	80.0%	5
Yes	10	90.9%	1	20.0%	11
Grand Total	11	100.00%	5	100.0%	16

90.9% of the ICT support teachers in the sponsored schools confirmed that they have been trained. Only 20% of their counterparts in the non-sponsored schools indicated the same. Again, this shows the effort of the NGOs in building the technical capacity within the schools for better acquisition of digital literacy skills. Also, data collected shows that

this responsibility is assigned to younger teachers, most of whom are not yet employed by TSC or are in their early years of service. This explains why many are not trained in the non-sponsored schools because they can only access this training once they get into TSC employment.

Table 4.26

Grade 6 Class Teachers - Teacher Capacity Building (Sponsored Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I have been trained on how to access and use the digital gadgets	0.0%	54.5 %	9.1%	0.0%	36.4%
I am well trained and able to train other teachers and learners	9.1%	45.5 %	36.4%	9.1%	0.0%
I am trained on basic maintenance of the gadgets	9.1%	36.4 %	27.3%	9.1%	18.2%
I train teachers on basic maintenance of the gadgets	9.1%	27.3 %	18.2%	9.1%	27.3%
I train learners on basic maintenance of the gadgets	9.1%	36.4 %	18.2%	18.2%	18.2%
I train teachers and learners to access the digital content	9.1%	72.7 %	9.1%	9.1%	0.0%

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I train teachers and learners to use the gadgets without aid	9.1%	54.5 %	27.3%	0.0%	9.1%
We are given regular refresher training	18.2%	18.2 %	9.1%	27.3%	18.2%

Table 4.27

Grade 6 Class Teachers - Capacity Building (Comparative Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I have been trained on how to access and use the digital gadgets	40.0%	40.0 %	0.0%	20.0%	0.0%
I am well trained and able to train other teachers and learners	0.0%	20.0 %	20.0%	20.0%	20.0%
I am trained on basic maintenance of the gadgets	0.0%	0.0%	0.0%	40.0%	40.0%
I train teachers on basic maintenance of the gadgets	0.0%	20.0 %	0.0%	20.0%	40.0%
I train learners on basic maintenance of the gadgets	20.0%	20.0 %	0.0%	20.0%	20.0%

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I train teachers and learners to access the digital content	0.0%	20.0%	20.0%	20.0%	20.0%
I train teachers and learners to use the gadgets without aid	0.0%	20.0%	20.0%	20.0%	20.0%
We are given regular refresher training	0.0%	0.0%	20.0%	20.0%	60.0%

Teachers in sponsored schools reported better training and capacity-building programs. While no teachers strongly agreed that they had been trained on how to access and use digital gadgets, 54.5% agreed. In terms of being well trained and able to train others, 9.1% strongly agreed and 45.5% agreed. This resonates with the opinions of the learners that their teachers needed more training.

Training on basic maintenance was less positive even in the sponsored schools, with only 9.1% strongly agreeing and 36.4% agreeing in the sponsored category. In the comparative schools, the training was poor, with 40.0% strongly disagreeing. This indicates a high possibility of having more spoilt devices and/or dependence on external support for maintenance and justifies the high number of spoilt devices especially in the comparative schools.

Regular refresher training opportunities in the sponsored schools was reported by 18.2% strongly agreeing and 18.2% agreeing, though 27.3% disagreed. In the comparative schools, this was completely absent, with 20% of the respondents holding a neutral

opinion and 80% disagreeing. This shows a clear gap and is one of the major hindrances to successful acquisition of digital skills within these schools.

These findings are also supported by the study done by Kiugu (2020) in which 98% of the sampled headteachers reported that they did not have any technical capacity to carry out regular servicing and maintenance of the gadgets. This poses major challenges in the implementation of DLPs in public primary schools because without technical support, users get stuck, and devices fail to function.

Table 4.28

Grade 6 Class Teachers - Capacity Building Table 2 (Sponsored Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Troubleshoot devices whenever they have an issue	9.1%	54.5 %	18.2%	18.2%	0.0%
There is someone who can offer help if the gadget has an issue that I cannot address	27.3%	45.5 %	9.1%	18.2%	0.0%
Access gadgets and digital materials easily	18.2%	45.5 %	9.1%	27.3%	0.0%
Reset passwords when necessary	9.1%	36.4 %	18.2%	27.3%	9.1%
Monitor what users are doing with the gadgets	36.4%	36.4 %	18.2%	9.1%	0.0%
Monitor what users are doing on the platforms they access	27.3%	36.4 %	27.3%	9.1%	0.0%

Table 4.29

Grade 6 Class Teachers - Teacher Capacity Building Table 2 (Comparative Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Troubleshoot devices whenever they have an issue	0.0%	20.0 %	0.0%	40.0%	20.0%
There is someone who can offer help if the gadget has an issue that I cannot address	0.0%	60.0 %	0.0%	20.0%	20.0%
Access gadgets and digital materials easily	0.0%	80.0 %	0.0%	20.0%	0.0%
Reset passwords when necessary	0.0%	40.0 %	20.0%	20.0%	0.0%
Monitor what users are doing with the gadgets	20.0%	40.0 %	0.0%	20.0%	0.0%
Monitor what users are doing on the platforms they access	0.0%	40.0 %	20.0%	20.0%	0.0%

While the data collected shows technical capacity deficiencies in both sponsored and non-sponsored schools, the deficiencies are more in non-sponsored schools with most of the teachers expressing little confidence in their ability to offer technical support. This shows the over-reliance on external capacity and the inability of the gadget users to take active responsibility in maintaining the devices.

There is no clear responsibility on repair and maintenance, and this is supported by Omito (2020) whose study revealed that teachers were not sure whose responsibility it was to

maintain the gadgets. The study showed that 7.1% believed the school was responsible, 33.9% ICT Authority of Kenya, 19.6% Ministry of Education and a further 39.6% indicating that they did not know whose responsibility that was. This indicates a lack of clarity in the design of the DLP that has continued to challenge schools and pose challenges to the implementation of the programme.

Table 4.30

ICT Support Teacher -Teacher Capacity Building - Table 1 (Sponsored Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I have been trained on how to access and use the digital gadgets	36.4%	54.5 %	0.0%	0.0%	0.0%
I am well trained and able to train other teachers and learners	18.2%	27.3 %	9.1%	9.1%	27.3%
I am trained on basic maintenance of the gadgets	27.3%	18.2 %	18.2%	0.0%	27.3%
I train teachers on basic maintenance of the gadgets	18.2%	9.1%	27.3%	9.1%	27.3%
I train learners on basic maintenance of the gadgets	27.3%	27.3 %	9.1%	0.0%	27.3%
I train teachers and learners to access the digital content	27.3%	27.3 %	0.0%	18.2%	18.2%

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I train teachers and learners to use the gadgets without aid	18.2%	36.4 %	9.1%	0.0%	27.3%
We are given regular refresher training	0.0%	0.0%	18.2%	45.5%	27.3%

Table 4.31

ICT Support Teacher -Teacher Capacity Building - Table 1 (Comparative Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I have been trained on how to access and use the digital gadgets	40.0%	40.0%	0.0%	20.0%	0.0%
I am well trained and able to train other teachers and learners	0.0%	40.0%	20.0%	40.0%	0.0%
I am trained on basic maintenance of the gadgets	20.0%	20.0%	0.0%	40.0%	20.0%
I train teachers on basic maintenance of the gadgets	0.0%	60.0%	0.0%	20.0%	20.0%
I train learners on basic maintenance of the gadgets	20.0%	40.0%	20.0%	0.0%	20.0%
I train teachers and learners to access the digital content	0.0%	80.0%	20.0%	0.0%	0.0%
I train teachers and learners to use the gadgets without aid	20.0%	40.0%	40.0%	0.0%	0.0%
We are given regular refresher training	0.0%	40.0%	0.0%	0.0%	40.0%

80% of the headteachers stated that one of the key roles of the ICT support teacher is to offer digital literacy training to the rest of the teachers and the learners. However, this appears to be an existing challenge because most of the ICT support teachers sampled did not indicate having confidence in training others. In the sponsored schools for example, only 54.6% of the teachers said that they could train other teachers and learners on how to access content and use the devices, with 18.2% strongly disagreeing that they have that ability. This shows an ongoing challenge and confirms the findings of the Presidential Working Party of Education Reforms report (2023) that increased application of digital methods in the 21st century classroom needs vigorous training of teachers and that was found to be a major gap.

While it is expected that these are the teachers who would help with basic maintenance and repair of the gadgets in the schools, data collected shows that in both sponsored and non-sponsored schools, only 40% of them expressed confidence in having the training and capacity to deliver this support. 60% of the teachers in the non-sponsored schools disagreed that they could offer this support. This shows the existing capacity gaps that threaten efficient use of the devices in schools to bridge the digital literacy gaps.

Table 4.32

ICT Support Teacher -Teacher Capacity Building - Table 2 (Sponsored Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Troubleshoot devices whenever they have an issue	0.0%	27.3 %	18.2%	18.2%	27.3%
There is someone who can offer help if the gadget has an issue that I cannot address	0.0%	36.4 %	0.0%	9.1%	45.5%
Access gadgets and digital materials easily	0.0%	63.6 %	18.2%	0.0%	9.1%
Reset passwords when necessary	0.0%	27.3 %	18.2%	9.1%	36.4%
Monitor what users are doing with the gadgets	0.0%	36.4 %	9.1%	0.0%	45.5%
Monitor what users are doing on the platforms they access	0.0%	36.4 %	9.1%	9.1%	36.4%

Table 4.33

ICT Support Teacher -Teacher Capacity Building - Table 2 (Comparative Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Troubleshoot devices whenever they have an issue	0.0%	60.0%	20.0%	20.0%	0.0%
There is someone who can offer help if the gadget has an issue that I cannot address	0.0%	40.0%	40.0%	20.0%	0.0%
Access gadgets and digital materials easily	0.0%	40.0%	20.0%	20.0%	20.0%
Reset passwords when necessary	0.0%	80.0%	0.0%	20.0%	0.0%
Monitor what users are doing with the gadgets	0.0%	20.0%	20.0%	20.0%	40.0%
Monitor what users are doing on the platforms they access	0.0%	40.0%	20.0%	20.0%	20.0%

The data collected shows that teachers in the sponsored schools have more access to technical capacity in case they need help with the devices and the digital content. This indicates higher possibilities of users having more access to digital technology in the sponsored schools.

According to Hacker and van Dijk (2000), inequalities in skills make individuals incapable of utilizing digital technology even if they are provided with gadgets and equipment. Conquering these inequalities and equipping digital technology users takes

training, retraining, and a lot of practice to overcome both the skills barriers and the psychological access barriers as described in the theory used in this study.

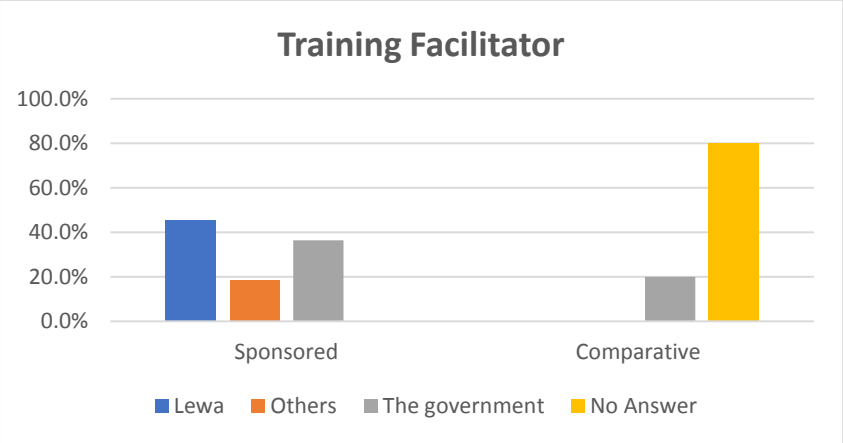
Table 4.34

Training Facilitator - Grade 6 Class Teacher

	Sponsored		Comparative		Total
	Frequency	Percent	Frequency	Percent	Frequency
Lewa	5	45.45%	0	0.0%	5
Others	2	18.18%	0	0.0%	2
The government	4	36.36%	1	20.0%	5
No Answer	0	0.00%	4	80.0%	4
Grand Total	11	100.00%	5	100.0%	16

Figure 4.9

Training Facilitator - Grade 6 Class Teachers



Data collected shows that there are more training opportunities offered by NGOs, with the government being the second convener of the training. Teachers in sponsored

schools get more training opportunities from NGOs. 80% of the respondents from non-sponsored schools did not respond to this question, indicating their uncertainty and lack of confidence about the training exposure.

Table 4.35

Refresher Courses – Class Teachers

	Sponsored		Comparative		Total
	Frequency	Percent	Frequency	Percent	Frequency
Yes	6	54.5%	1	20.0%	7
Non	5	45.5%		0.0%	5
No Answer		0.0%	4	80.0%	4
Grand Total	11	100.0%	5	100.0%	16

Table 4.36

Facilitators of Refresher Courses Facilitator for Class Teachers

	Sponsored		Comparative		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Government	3	18.8%	0	0.0%	3	18.8%
Lewa	7	43.8%	0	0.0%	7	43.8%
No Answer	1	6.3%	5	31.3%	6	37.5%
Grand Total	11	68.8%	5	31.3%	16	100.0%

Sponsored schools again showed a clear advantage, with a higher percentage of teachers reporting that they had received training on accessing and using digital gadgets. Refresher training is more available in sponsored schools. All the 5 teachers in the non-sponsored schools did not give any opinion on whether they had access to refresher trainings.

Table 4.37

Descriptive Statistics on Availability of DLP Capacity-Building Programs

Metric	Frequency	Mean	Standard Deviation
Digital Learning Training (NGO)	14	0.7	0.3
Digital Learning Training (Non-NGO)	15	0.4	0.3
Training Facilitators (NGO)	16	0.5	0.4
Training Facilitators (Non-NGO)	16	0.2	0.4

Capacity-building programs are essential for the effective use of digital learning tools. The analysis shows that digital learning training and refresher courses are available but not widespread, with mean scores around 0.7 for NGO-sponsored schools and 0.4 for non-sponsored schools. The standard deviation values are high, indicating significant variability in these programs' availability across schools. Training facilitators are present in about half of the schools, with a mean score of 0.5 in NGO-sponsored schools compared to 0.2 in non-sponsored schools. This suggests a gap in consistent training availability, which can hinder the effective use of digital technologies. NGO-sponsored schools are better equipped with these programs, emphasizing the role of NGOs in enhancing teacher preparedness and confidence in using digital technologies.

4.7.1 Qualitative Analysis

Headteachers emphasized the importance of continuous training for teachers. Those from NGO-supported schools reported regular workshops and refresher courses provided by NGOs, which significantly improved teachers' digital literacy skills and confidence. In contrast, non-sponsored schools reported reliance on irregular government training programs. Government sponsored training programs were also offered to NGO sponsored schools.

The analysis further indicated different perspectives into the issue of teacher training; first, there was data indicating that teachers are often given very short training through the MOE and that the training sessions are not followed with any practical application in the classroom. Such teachers were said to mostly consider themselves untrained because whatever digital concepts they were taught were not put into practice and were immediately forgotten. One headteacher mentioned that nearly 90% of his teachers had received training but a significant number had no confidence in digital literacy and believed they had little ability to integrate digital pedagogies in their curriculum delivery.

Second is that one headteacher pointed out that teachers attend training but back in the school, they do not find the equipment they expect to support their curriculum delivery. The headteacher went ahead to explain how one time she sent 3 teachers for digital literacy training and when they came back, they presented her with a list of gadgets to be purchased for them to practice their newly learnt skills. Unfortunately, the school could not afford the equipment, and this left the trained teachers discouraged and unable to use their skills to benefit them. This according to Dijk (2000) leaves the trainees with a combination of many inadequacies ranging from material gaps, skills gaps and

psychological gaps, that makes it impossible for people to acquire digital literacy competencies.

The interview with another headteacher from a sponsored school indicated that fear of technology by the teachers is a major challenge facing DLP programmes. He explained that the sponsor program trained teachers in the sponsored schools regularly and even retrained them but still, some will never say they were trained. He cited this as mere fear for technology and for responsibility. He added that this fear limits many teachers from being innovative and utilizing the technology available to them to enhance more interactive lessons, which is key within the CBC framework.

The respondents further mentioned that:

> ***Respondent C:"****80% of our training sessions are sponsored by the Government" and the schools' internal efforts.*
>
> ***Respondent J:*** *"The regular workshops and refresher courses provided by NGOs have significantly improved our teachers' digital literacy skills."*
>
> ***Respondent K:*** *"Our teachers only receive training sporadically, which is not enough to keep them updated with the latest digital tools and techniques."*
>
> ***Respondent O:*** *"Technical staff visit from Lewa once a week to support the staff on use of the digital gadgets"*

Some of the headteachers felt that while the training was provided, it was either too short, or impractical.

Respondent F: *"To some extent trainings are provided though they are too short and not practical."*

Respondent M: "*Yes, there is training provided but there is specific content in the gadgets that trains the teachers****."***

These opinions underscore the pivotal role of training in supporting the uptake of DLPs. Headteachers understand that availability of gadgets is not sufficient to drive access. They understand that teachers must be well trained to use the gadgets and support utilization programs in schools. The relevance and depth of the training also comes up as a key factor in the quality of training. That it must be sufficient to equip the teacher with knowledge and skill, and relevant to the existing set up in the schools. The training must align with the resources available to the teacher in the school to avoid frustration and impracticality of the training programs.

4.7.2 Hypothesis Results on the DLP Capacity-building Programs

The data was subjected to regression analysis to determine whether there is a significant difference in the DLP capacity-building programs between schools with NGO support and those without.

Regression Model: Enhanced Digital Literacy Access $= \beta 0 + \beta 1 \times$ DLP Capacity Building Programs $+ \epsilon$

Table 4.38

Regression Analysis on Capacity Building Programmes

Variable	Sponsored β	Sponsored p	Non-Sponsored β	Non-Sponsored p
School Managers Training	0.48	0.01	0.35	0.05
Regular Training	0.4	0.01	0.3	0.1
Refresher Training	0.33	0.05	0.25	0.1

The availability of capacity-building programs for digital literacy also differs between sponsored and non-sponsored schools. Training for school managers in sponsored schools has a significant impact on digital literacy access ($\beta = 0.48$, $p = 0.01$). In non-sponsored schools, this training has a moderate impact ($\beta = 0.35$, $p = 0.05$). Regular training programs in sponsored schools show a strong influence ($\beta = 0.40$, $p = 0.01$), while in non-sponsored schools, the influence is limited ($\beta = 0.30$, $p = 0.10$). Refresher training programs positively affect sponsored schools ($\beta = 0.33$, $p = 0.05$), but have a minimal effect in non-sponsored schools ($\beta = 0.25$, $p = 0.10$).

The data analysis indicates significant differences in the availability and effectiveness of DLP capacity-building programs between NGO-sponsored and non-sponsored schools. Sponsored schools consistently reported higher levels of training, better digital skills, and more effective capacity-building programs for both learners and teachers.

Therefore, H03 can be rejected, indicating a significant difference in DLP capacity-building programs between NGO-sponsored and non-sponsored public primary schools. Sponsored schools demonstrate better availability and effectiveness of capacity-building programs, reflecting the positive impact of NGO sponsorship.

4.8 The Relevance of Digital Content Available

The fourth objective evaluated the relevance of digital content available for teaching and learning. Sponsored schools reported higher satisfaction with the digital content. For instance, 47.9% of learners in sponsored schools strongly agreed that the digital content was well organized and easily accessible, while only 36.6% in non-sponsored schools reported the same. Additionally, the content in sponsored schools was perceived as more interactive and engaging, with 50.0% of learners strongly agreeing on its interactivity compared to 18.3% in non-sponsored schools.

Table 4.39

Content Learners Consume in the Devices

Activity	Frequency	Percentage
Learn New Things	199	75.1%
Research Projects	114	43.0%
Practice Skills	124	46.8%
Use Scratch	54	20.4%
Take Tests	103	38.9%
Play Educational Games	97	36.6%
Access Digital Content	107	40.4%
Watch Videos	133	50.2%

Data collected shows that most of the learners use the devices to learn new things. A good number also watch videos, do research and practice digital skills. Coding is the least practiced skill, with only 54 learners indicating that they use the devices for scratch projects. This shows that even though the president launched the programme in 2022, the practical application and teaching of the same in public primary schools is still very low.

Table 4.40

Grade 6 Learners - Relevance of digital content in Sponsored Schools

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Is well organized and easily accessible to learners	47.9%	39.2 %	7.7%	2.1%	1.5%
Is rich with text, pictures, videos, simulations, and evaluation tests	45.9%	36.1 %	4.1%	4.1%	7.7%
Is highly interactive and allows active participation	50.0%	32.5 %	10.8%	3.1%	1.5%
Makes learning more interesting for me	59.3%	34.0 %	1.5%	2.1%	1.0%
Is more interactive and engaging than physical book content	44.8%	36.6 %	6.7%	7.2%	1.5%
Increases my motivation to attend school	46.9%	35.1 %	8.8%	3.1%	4.1%
Should be increased to make my lessons more interactive	51.5%	32.0 %	7.2%	5.2%	0.5%
Is in line with what I expected to learn in CBC	58.8%	33.0 %	3.1%	0.5%	1.0%

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I can access scratch for practical coding lessons	23.7%	27.3 %	6.7%	18.0%	21.1%
I can use scratch to create innovative coding projects	16.5%	27.8 %	10.3%	17.0%	25.8%
I can do quizzes and evaluations using the devices	44.8%	34.5 %	5.7%	8.2%	4.1%
I can access storybooks and other reading resources.	52.6%	34.0 %	3.6%	3.1%	3.6%

Table 4.41

Grade 6 Learners - Relevance of digital content - Comparative Schools

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Is well organized and easily accessible to learners	36.6%	12.7 %	7.0%	5.6%	36.6%
Is rich with text, pictures, videos, simulations, and evaluation tests	39.4%	4.2%	14.1%	2.8%	38.0%
Is highly interactive and allows active participation	18.3%	12.7 %	39.4%	4.2%	22.5%
Makes learning more interesting for me	38.0%	11.3 %	29.6%	2.8%	16.9%
Is more interactive and engaging than physical book content	22.5%	11.3 %	40.8%	4.2%	15.5%
Increases my motivation to attend school	29.6%	15.5 %	32.4%	5.6%	14.1%
Should be increased to make my lessons more interactive	32.4%	12.7 %	31.0%	4.2%	15.5%
Is in line with what I expected to learn in CBC	31.0%	15.5 %	28.2%	4.2%	9.9%

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I can access scratch for practical coding lessons	19.7%	14.1 %	12.7%	7.0%	45.1%
I can use scratch to create innovative coding projects	18.3%	8.5%	14.1%	11.3%	46.5%
I can do quizzes and evaluations using the devices	23.9%	12.7 %	15.5%	7.0%	39.4%
I can access storybooks and other reading resources.	42.3%	5.6%	11.3%	2.8%	36.6%

47.9% of learners in sponsored schools reported that digital content is well-organized and easily accessible, compared to 36.6% in non-sponsored schools. Teachers and ICT support teachers in sponsored schools also reported higher organization and accessibility (87.1% vs. 49.3%). 50.0% of learners in sponsored schools reported that digital content is highly interactive, compared to 18.3% in non-sponsored schools. Teachers and ICT support teachers in sponsored schools also noted higher interactivity (82.5% vs. 31.0%)

91.8% of learners in sponsored schools reported that digital content is in line with the CBC curriculum, compared to 46.5% in non-sponsored schools. Teachers and ICT support teachers in sponsored schools also noted higher curriculum alignment (81.8% vs. 63.7%)

Table 4.42

Grade 6 Class Teachers - Relevance of digital content (Sponsored Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Is in line with the Grade 6 CBC curriculum design	54.5%	27.3 %	9.1%	9.1%	0.0%
Is well organized and easily accessible to the teachers and learners	45.5%	36.4 %	0.0%	18.2%	0.0%
Covers all learning areas in Grade 6	27.3%	54.5 %	0.0%	9.1%	9.1%
Is ideal for delivering learning interactions in class	36.4%	45.5 %	18.2%	0.0%	0.0%
Is rich with text, pictures, videos, simulations, and evaluation tests	45.5%	36.4 %	9.1%	9.1%	0.0%
Is highly interactive and allows active participation of users	36.4%	45.5 %	18.2%	0.0%	0.0%
Is updated regularly to suit the needs of the users and in line with the curriculum design	36.4%	45.5 %	9.1%	9.1%	0.0%
Is more interactive and engaging than physical book content	54.5%	18.2 %	18.2%	9.1%	0.0%

Table 4.43

Grade 6 Class Teachers - Relevance of digital content (Comparative Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Is in line with the Grade 6 CBC curriculum design	60.0%	20.0%	0.0%	20.0%	0.0%
Is well organized and easily accessible to the teachers and learners	40.0%	40.0%	0.0%	20.0%	0.0%
Covers all learning areas in Grade 6	20.0%	60.0%	0.0%	20.0%	0.0%
Is ideal for delivering learning interactions in class	40.0%	40.0%	0.0%	20.0%	0.0%
Is rich with text, pictures, videos, simulations, and evaluation tests	40.0%	40.0%	0.0%	20.0%	0.0%
Is highly interactive and allows active participation of users	60.0%	20.0%	0.0%	20.0%	0.0%
Is updated regularly to suit the needs of the users and in line with the curriculum design	20.0%	20.0%	0.0%	60.0%	0.0%
Is more interactive and engaging than physical book content	60.0%	20.0%	0.0%	20.0%	0.0%

In reference to access to scratch and coding, 51% of learners in sponsored schools reported that they can access Scratch for practical coding lessons, compared to 33.8% in non-sponsored schools. Teachers and DLP support teachers in sponsored schools also noted higher access to Scratch (51.0% vs. 33.8%). This indicates a more efficient DLP in the sponsored schools, with learners attending these schools having access to platforms to apply their acquired digital skills. This is key because coding is a high-level skill and one that indicates that learners are on the road to being content and computer program developers.

Table 4.44

Grade 6 Class Teachers - Relevance of digital content - Table 2 (Sponsored Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Enables teachers to create their own content such as videos, animations, pictures, and text	9.1%	54.5 %	27.3%	0.0%	9.1%
Enables learners to create their own content such as videos, animations, pictures, and text	9.1%	45.5 %	27.3%	9.1%	9.1%
Gives Learners access to Scratch for practical coding lessons	9.1%	45.5 %	27.3%	9.1%	9.1%
Learners can use Scratch to carry out innovative coding projects	18.2%	45.5 %	18.2%	18.2%	0.0%
Allow teachers to deploy quizzes and evaluations digitally	36.4%	54.5 %	9.1%	0.0%	0.0%

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Gives Learners access to storybooks and other reading resources.	54.5%	27.3 %	9.1%	9.1%	0.0%

Table 4.45

Grade 6 Class Teachers - Relevance of digital content

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Enables teachers to create their own content such as videos, animations, pictures, and text	20.0%	40.0%	0.0%	40.0%	0.0%
Enables learners to create their own content such as videos, animations, pictures, and text	0.0%	20.0%	40.0%	40.0%	0.0%
Gives Learners access to Scratch for practical coding lessons	20.0%	40.0%	0.0%	20.0%	0.0%
Learners can use Scratch to carry out innovative coding projects	20.0%	40.0%	20.0%	20.0%	0.0%
Allow teachers to deploy quizzes and evaluations digitally	20.0%	40.0%	0.0%	40.0%	0.0%
Gives Learners access to storybooks and other reading resources.	40.0%	40.0%	0.0%	20.0%	0.0%

The analyzed data shows that learners and teachers from sponsored schools have access to more interactive content, and platforms that allow creation of more content by both teachers and learners. It is also clear that teachers in sponsored schools can access

functions such as automated tests and readers more efficiently than their counterparts in the non-sponsored schools.

Table 4.46

ICT Support Teacher -Relevance of digital content - Table 1 (Sponsored Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Is in line with the Grade 6 CBC curriculum design	27.3%	36.4 %	9.1%	0.0%	18.2%
Is well organized and easily accessible to the teachers and learners	18.2%	36.4 %	0.0%	27.3%	9.1%
Covers all learning areas in Grade 6	9.1%	27.3 %	9.1%	36.4%	9.1%
Is ideal for delivering learning interactions in class	27.3%	45.5 %	0.0%	9.1%	9.1%
Is rich with text, pictures, videos, simulations, and evaluation tests	18.2%	36.4 %	9.1%	18.2%	9.1%
Is highly interactive and allows active participation of users	18.2%	63.6 %	0.0%	0.0%	9.1%
Is updated regularly to suit the needs of the users and in line with the curriculum design	9.1%	27.3 %	9.1%	9.1%	36.4%

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Is more interactive and engaging than physical book content	27.3%	45.5 %	0.0%	9.1%	9.1%

Table 4.47

ICT Support Teacher -Relevance of digital content - Table 1 (Comparative Schools)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Is in line with the Grade 6 CBC curriculum design	40.0%	20.0 %	0.0%	20.0%	20.0%
Is well organized and easily accessible to the teachers and learners	40.0%	20.0 %	0.0%	20.0%	20.0%
Covers all learning areas in Grade 6	20.0%	40.0 %	0.0%	20.0%	20.0%
Is ideal for delivering learning interactions in class	20.0%	40.0 %	0.0%	20.0%	20.0%
Is rich with text, pictures, videos, simulations, and evaluation tests	40.0%	20.0 %	0.0%	20.0%	20.0%
Is highly interactive and allows active participation of users	40.0%	20.0 %	0.0%	20.0%	20.0%
Is updated regularly to suit the needs of the users and in line with the curriculum design	40.0%	20.0 %	0.0%	20.0%	20.0%
Is more interactive and engaging than physical book content	40.0%	20.0 %	0.0%	20.0%	20.0%

More ICT teachers in sponsored schools reported better organization of the digital content, its richness and interactivity as well as alignment with the national curriculum than their counterparts in the non-sponsored schools.

44.8% of learners in sponsored schools reported that digital content is more interactive than physical books, compared to 22.5% in non-sponsored schools. This shows that learners enjoy using the digital platforms more than books. Teachers and ICT support teachers in sponsored schools also noted higher interactivity over physical books (81.4% vs. 33.8%). There are more class teachers agreeing to this than ICT support teachers and this could be because class teachers are more involved in classroom delivery than ICT support teachers.

Analyzed data also shows that 46.9% of learners in sponsored schools reported that digital content increases their motivation to attend school, compared to 29.6% in non-sponsored schools. This was corroborated by teachers and ICT support teachers, showing higher school motivation in sponsored schools (82.0% vs. 45.1%). This indicates the power of digital learning in influencing school attendance by learners, which is a key indicator of success in basic education.

Table 4.48

Descriptive Analysis on the Relevance of digital content

Metric	Frequency	Mean	Standard Deviation
Digital Content for CBC (NGO)	199	4.6	0.7
Digital Content for CBC (Non-NGO)	114	4.0	1.1
Interactive Content (NGO)	124	4.5	0.8
Interactive Content (Non-NGO)	54	3.5	1.3
More Interactive Than Books (NGO)	103	4.5	0.8
More Interactive Than Books (Non-NGO)	97	3.5	1.2
Access To Story books (NGO)	107	4.5	0.8
Access To Storybooks (Non-NGO)	133	3.7	1.5

The relevance of digital content is pivotal for engaging learners and aligning with the updated curriculum. The descriptive analysis indicates that digital content available to the sponsored schools is more relevant to the CBC framework. The interactivity of the content available to sponsored schools is higher, with a mean of 4.5 compared to 3.5 in the non-sponsored schools. The standard deviations are lower in sponsored schools, indicating a higher relevance and alignment of digital content with curriculum requirements, particularly in NGO-sponsored schools, which benefit from regularly updated and well-organized digital materials.

4.8.1 Qualitative Analysis

Headteachers from NGO-sponsored schools appreciated the ongoing support in updating digital content to align with the CBC. They noted that this ensures that the digital tools

are effectively used for teaching and learning. Non-sponsored schools often use outdated content, making it challenging to meet current educational standards.

> ***Respondent L:*** *"NGO support in updating digital content to align with the CBC has been invaluable. It ensures that our digital tools are used effectively in teaching and learning."*

> ***Respondent M:*** *"We often have to rely on outdated content, which makes it difficult to keep up with the current educational standards."*

The headteachers felt that some of the Grade 6 teachers had a positive attitude towards digital literacy and its integration in teaching/learning. Some of the teachers were initially afraid of the training but got comfortable after the training. In the non-sponsored schools, respondents felt that the teachers were demotivated as they lacked resources. Other teachers had technophobia which made them more comfortable using books as opposed to gadgets. Responses from the respondents included:

> ***Respondent F:*** *"The teachers are demotivated by the lack of resources. Some attend the trainings and come back asking the school administration to buy some gadgets but due to financial constraints we are unable to do so."*

> ***Respondent I:*** *"They are very positive about the power of ICT in delivering quality interactive lessons"*

> ***Respondent K:*** *"At first, they were afraid but on training they got comfortable and enjoy using digital technology of teaching"*

Respondent M: *The teachers suffer from Technophobia. The majority prefer books because they don't know how to use the devices."*

These opinions from the headteachers underscore the value of training and capacity development in enhancing the application of digital literacy in public primary schools. Considering that most of the teachers were not exposed to the CBC during their pre-service training, a lot of effort is needed to implement realistic and sufficient in-service training to make them comfortable using digital methods to support modern learning.

From the opinions of headteachers in sponsored schools that have regular training programs, sustained capacity enhancement programs can remove psychological and skills barriers, enabling the teachers to integrate digital literacy in their teaching and enhance the acquisition of the skills among the learners.

4.8.2 Hypothesis results on the relevance of digital content

The data collected was subjected to regression analysis to determine whether there is a significant difference in the relevance of the digital content available between schools with NGO support and those without.

Regression Model: Enhanced Digital Literacy Access= $\beta 0 + \beta 1 \times$ Relevance of Digital Content + ϵ

Table 4.49

Regression Variables on the relevance of digital content

Variable	Sponsored β	Sponsored p	Non-Sponsored β	Non-Sponsored p
CBC Digital Content	0.55	0.01	0.4	0.05
Content Accessibility	0.47	0.01	0.3	0.1
Content Customization	0.39	0.05	0.2	0.1

The relevance of digital content available for teaching and learning shows that CBC digital content has a significant impact on digital literacy access in sponsored schools ($\beta = 0.55$, $p = 0.01$). In non-sponsored schools, the impact is moderate ($\beta = 0.40$, $p = 0.05$). Content accessibility strongly influences digital literacy in sponsored schools ($\beta = 0.47$, $p = 0.01$), while in non-sponsored schools, the influence is limited and marginally significant ($\beta = 0.30$, $p = 0.10$). The ability to customize content shows a positive impact in sponsored schools ($\beta = 0.39$, $p = 0.05$) but minimal effect in non-sponsored schools ($\beta = 0.20$, $p = 0.10$).

The last hypothesis of this study stated that there is no significant difference in the relevance of the available digital content between schools with NGO sponsorship and those without the sponsorship. However, the analyzed data shows that sponsored schools demonstrated the availability of more relevant digital content, supporting the rejection of H04.

4.8.3 Summary

Regression analysis allows the researcher to understand and quantify the relationship between various independent variables and the dependent variable, which is enhanced digital literacy access. By comparing the impacts of these variables between NGO-sponsored and non-sponsored schools, we can identify key areas where NGO support has been most beneficial and highlight areas requiring further attention. The results of this analysis informed the recommendations for targeted interventions to further improve digital literacy access in public primary schools, ultimately contributing to bridging the digital literacy gap in these rural communities.

Figure 4.10

Summary of β values chart

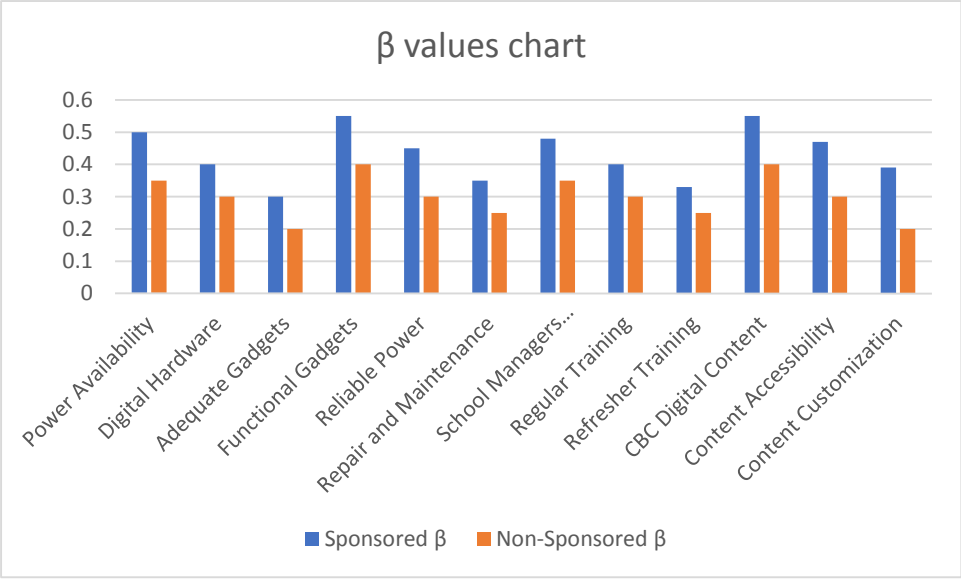
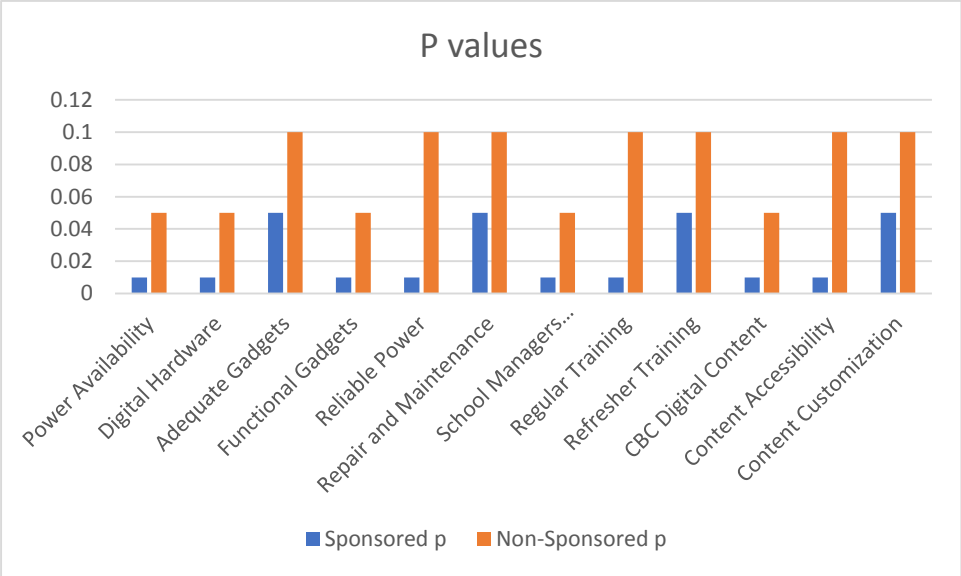


Figure 4.11

Summary of P values



NGO-sponsored schools generally show stronger and more significant impacts across all variables related to the availability and functionality of digital learning infrastructures, capacity-building programs, and the relevance of digital content. The beta coefficients indicate that variables like power availability, digital hardware, functional gadgets, and CBC digital content have substantial positive effects on digital literacy access in sponsored schools. In contrast, non-sponsored schools show moderate to minimal impacts on digital literacy access. Key variables like functional gadgets and school managers training still have significant effects but to a lesser extent compared to sponsored schools.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings, and the study's conclusion and recommendations. The purpose of the study was to evaluate the role NGOs play in bridging the digital literacy access gaps in public primary schools in Buuri and Isiolo sub-counties. The study specifically sought to find out the availability of digital learning infrastructures in NGO sponsored and non-sponsored schools; assess the functionality of the gadgets available in the sponsored and non-sponsored schools, assess the capacity-building programs available in sponsored and non-sponsored schools; and evaluate the relevance of the digital content available in sponsored and non-sponsored schools.

The theory guiding the collection and analysis of data, as well as the interpretation of the same was Jan Van Dijk's Theory of Digital Technology Access and Social Impacts. The study used descriptive survey design, targeting 79 public primary schools, 79 public primary schools, 79 headteachers, 79 Grade 6 class teachers, 79 ICT support teachers, 2,196 Grade 6 learners, and 1 digital literacy officer from the sponsoring NGO. Stratified sampling, systematic sampling, and simple random sampling techniques were used to select 16 schools, 16 head teachers, 16 Grade 6 class teachers, 16 ICT support teachers, 1 digital literacy officer, and 219 Grade 6 learners for the study sample. Questionnaire surveys, key informant interview schedules and observation checklists were used to collect data, which were analyzed using descriptive statistics and presented in tables. Cronbach Alpha formulae was used to test the reliability of the instruments and regression analysis used to test hypothesis.

5.2 Summary of Findings

The main points of the study are organized in order of objectives. Data was collected from headteachers, Grade 6 class teachers, ICT support teachers, and Grade 6 learners. Analysis was done and the summary is organized in order of objectives as below:

5.2.1 Availability of Digital Learning Infrastructures

The first objective of the study was to assess the availability of the digital learning infrastructures in NGO-sponsored and non-sponsored public primary schools in Buuri and Isiolo sub-counties. NGO-sponsored schools demonstrated a significantly higher availability of essential digital learning infrastructures compared to their non-sponsored counterparts.

Also, necessary electrical wiring and power sockets were much more prevalent in sponsored schools. The reliability of the electricity supply, sourced from both Kenya Power and solar connections, was markedly higher in sponsored schools. This ensured a steady and consistent power supply for digital devices, which is crucial for maintaining uninterrupted digital learning activities. The more reliable electricity infrastructure in sponsored schools underscores their enhanced capacity to support digital education effectively compared to non-sponsored schools.

5.2.2 Functionality of Digital Learning Infrastructures

The second objective of the study was to assess the functionality of digital learning infrastructures in NGO-sponsored and non-sponsored public primary schools in Buuri and Isiolo sub-counties. Sponsored schools exhibited superior functionality of digital devices compared to non-sponsored schools.

The condition of digital gadgets in sponsored schools was also notably better. This disparity indicates that sponsored schools not only have more digital devices available but also maintain them in better working order.

5.2.3 Availability of DLP Capacity-Building Programs

The third objective of the study was to assess the availability of DLP capacity-building programs in NGO-sponsored and non-sponsored public primary schools in Buuri and Isiolo sub-counties. The availability and comprehensiveness of DLP capacity-building programs were significantly higher in NGO-sponsored schools compared to non-sponsored schools. This substantial difference indicates that in sponsored schools there are more robust programs to equip users with the necessary skills to utilize digital devices effectively.

Moreover, training on the basic maintenance of digital gadgets was more prevalent in sponsored schools. This additional training helps ensure that learners are not only users but also competent in handling minor issues with their devices, contributing to the overall sustainability of digital learning tools.

Teachers in sponsored schools also felt better prepared and more capable of training others. Specifically, 54.5% of teachers in sponsored schools agreed that they were well-trained, enabling them to effectively pass on their knowledge to both learners and new teachers. In contrast, only 40.0% of teachers in non-sponsored schools felt similarly prepared. This indicates that capacity-building programs in sponsored schools are more effective, providing teachers with the skills and confidence needed to foster a robust digital learning environment.

5.2.4 Relevance of Digital Content

The fourth objective of the study was to evaluate the relevance of digital content available for teaching and learning in public primary schools in NGO-sponsored and non-sponsored public primary schools in Buuri and Isiolo sub-counties. The digital content available in NGO-sponsored schools was perceived as significantly more relevant, well-organized, and interactive compared to that in non-sponsored schools. A notable 47.9% of learners in sponsored schools strongly agreed that the digital content was well-organized and easily accessible. In contrast, only 36.6% of learners in non-sponsored schools reported the same, highlighting a disparity in the quality and accessibility of digital learning materials.

Additionally, the digital content in sponsored schools was richer in multimedia elements and more closely aligned with the curriculum, which significantly enhanced the learning experience. For instance, 50.0% of learners in sponsored schools strongly agreed that the digital content was highly interactive, while only 18.3% of learners in non-sponsored schools felt similarly. This indicates that the digital content in sponsored schools is more engaging and better designed to support interactive learning, thereby making lessons more dynamic and effective for learners.

5.2.5 Conclusion

The findings from this study provide valuable insights into the role of NGOs in bridging the digital literacy access gap in public primary schools in Buuri and Isiolo sub-counties, Kenya. The study led to several important conclusions regarding the role NGO sponsorship plays in enhancing digital literacy in public primary schools:

The first conclusion is that NGO-sponsored schools possess significantly superior digital learning infrastructures compared to their non-sponsored counterparts. The robust construction of classrooms, reliable electricity supply, and the availability of essential wiring and power sockets collectively create an environment that is highly conducive to effective DLPs. This enhanced infrastructure provides a stable foundation for the integration and use of digital technologies in the school.

Secondly, the functionality of digital devices is markedly better in sponsored schools. The researcher concludes that NGOs play a significant role in sponsoring DLPs, providing over half of the devices in the sponsored schools. The devices they sponsor have a high functionality rate, reflecting positively on their maintenance or the quality of devices provided. Learners in these schools have higher access to well-maintained digital gadgets, such as smart boards, tablets and computers, which ensure that they can effectively utilize these tools to enhance their learning experiences and improve their digital skills. The better condition and reliability of these devices in sponsored schools contribute significantly to the overall effectiveness of the DLPs in the school.

The study also concludes that sponsored schools have capacity-building programs that significantly enhance digital literacy among both learners and teachers. These programs provide comprehensive training that ensures users are proficient in both the use and maintenance of digital devices. The effectiveness of these capacity-building initiatives means that learners and teachers in sponsored schools are better equipped to integrate digital technologies into their daily educational activities, and the learners get early exposure to digital technology, a skill that will highly empower them and make them fitter for the 21st century digital world.

Ultimately, the study concludes that the digital content available in sponsored schools is of higher quality, more relevant, interactive, and well-aligned with the curriculum. This quality content is characterized by its organization and accessibility, which increases learner engagement and motivation. The inclusion of rich multimedia elements and interactive features in the digital content makes learning more engaging and effective, leading to improved digital literacy competencies among learners.

These conclusions collectively highlight the significant positive impact of NGO sponsorship on the digital learning environments in public primary schools, demonstrating that sponsored schools are better positioned to leverage digital technologies and prepare young learners for the 4th industrialization.

5.3 Recommendations

1. The researcher recommends that efforts be made to increase NGO sponsorship in public primary schools to increase the chances of learners attending the schools getting access to the essential digital skills. This could involve intentional efforts by the Ministry of Education to reach out to NGOs and pursue partnership opportunities in this direction.

2. The research also recommends that immediate steps be taken by the government and NGOs supporting education initiatives to upgrade the digital infrastructures in public primary schools. This includes improving classroom facilities, ensuring reliable electricity supply, provision of digital learning gadgets and providing safe storage for digital devices. This is an important step in enhancing the ability of schools to improve digital learning and prepare global citizens, in line with the CBC framework.

3. The research recommends that capacity-building programs be given emphasis in public primary schools. For there to be successful implementation of the CBC and attainment of digital literacy competencies, the government, particularly TSC, needs to enhance robust in-service retooling programs to support the teachers.

4. The researcher further recommends that the MOE device better procedures of monitoring and evaluating the digital learning programs deployed in schools. This will help identify gaps and areas for improvement early enough, ensuring that the digital learning environment continuously evolves to meet the needs of learners and teachers, and ultimately prepare the learners for the digital world.

5. The researcher recommends further studies in the digital literacy area to find out how the exposure to digital literacy relates to learners' career choices eventually, and the impact of the investment in driving inclusivity in access to education.

6. The researcher recommends that the Ministry of Education in Kenya should aim to achieve the same as in sponsored schools.

REFERENCES

Ale, K., Loh, Y. A. C., & Chib, A. (2017). Contextualized-OLPC education project in rural India: measuring learning impact and mediation of computer self-efficacy. *Educational Technology Research and Development*, *65*(3), 769–794. https://doi.org/10.1007/s11423-017-9517-2

C.R Kothari. (2004). *Research Methodology: methods and Techniques* (2nd Ed.). New Age International (P) Limited Publishers.

Explorance, (2023). *7 Reasons Why Learners Need Technology in the Classroom.* https://explorance.com/blog/7-reasons-learners-need-technology-classroom/

Farrell, G. (2007). ICT in Education in Kenya. *Policy*, *1*(1), 1–14. https://documents1.worldbank.org/curated/ar/616481468047703710/pdf/463850BRI0Box31ya010ICTed0Survey111.pdf

Grad Coach. (2023). *Quantitative Research Design: All you need to know (with examples)*. https://www.youtube.com/watch?v=VQbkw-SI8c4

Government of Kenya. (2023a). *Budget Statement 2023-24*. https://www.treasury.go.ke/wp-content/uploads/2023/06/Budget-Statement-for-the-FY-2023-24.pdf

Government of Kenya. (2023b). *Report of the Presidential Working Party on Education Reform: Transforming Education, Training and Research for Sustainable Development in Kenya*. https://education.go.ke/node/429

Hacker, K., & van D. J. (2000). The digital divide Utrecht University. *50th Annual Conference of the International Communication Association*. http://www.utwente.nl/gw/vandijk/research/digital_divide/Digital_Divide_overigen/pdf_digitaldivide_website.pdf

Israel, G. D. (1992). *Determining sample size*. ResearchGate

Jarman, H. (2004). The learners guide to research ethics. In *Accident and Emergency Nursing*, *12* (3), 1-14. https://doi.org/10.1016/j.aaen.2003.12.001

Joynes, C. G., & Emma, S. K. (2020). Overview of emerging country- level response to providing educational continuity under COVID-19 What's working? What isn't? *EdTech and Coronavirus, 1*(1), 1-14. https://docs.edtechhub.org/lib/IPAT355N

Keengwe, J., Onchwari, G., & Wachira, P. (2008). Computer technology integration and student learning: Barriers and promise. *Journal of science education and technology*, *17*(1), 560-565. https://www.jstor.org/stable/41219452

Kenya Iinstitute of Curriculum Development. (2019). *Basic Education Curriculum Framework*. Kenya Institute Of Curriculum Development.

Kiugu, D. K. (2020). *Preparedness For Implementation Of Integration Of Digital*

Learning In Public Primary Schools In Meru County, Kenya [Doctoral Dissertation, Kenya Methodist University]. Kenya. http://repository.kemu.ac.ke/handle/123456789/882

Krönke, M. (2020). Africa's digital divide and the promise of e-learning. *AFRO Barometer*, *66*(1), 1–20. http://afrobarometer.org/sites/default/files/publications/Policy papers/pp66-africas_digital_divide_and_the_promise_of_e-learning-afrobarometer_policy_paper-14june20.pdf

Lewa Wildlife Conservancy. (2023). *School Programs. Digital Literacy*. https://www.lewa.org/impact/education-2/school-programs-2/

Lyons, A. C., Kass-Hanna, J., Zucchetti, A., & Cobo, C. (2019). The future of work & education for the digital age: Bridging the gap between digital skills & employability for vulnerable populations. *International Journal of Information and Communication Technology Research*, *20*(*1*), 1–16. https://www.researchgate.net/publication/332013345

Mariga, G., Ogenga, S., Shikali, C., & Muliaro, J. (2017). Computer Laptop Project Strategy for Basic Education Schools in Kenya Computer Laptop Project Strategy for Basic Education Schools in Kenya. *International Journal of Information and Communication Technology Research*, *7*(5), 1–13. https://doi.org/10.6084/m9.figshare.10058663

Morgan, S. L. (2007). Expectations and Aspirations. *The Blackwell Encyclopedia of Sociology*. *1*(1), 1-22. https://doi.org/10.1002/9781405165518.wbeose085

Muriira, L. M. (2019). *THE Challanges and potentials of the class one laptop project*. https://www.academia.edu/6223812/the_challenges_and_potentials_of_the_class_one_laptop_project

Murray, R., Moore, S., Stokes, F., Angeli, E. L., Khadivzadeh T, Saif A. V. N., Molinatti, C., Yin, R. K., Vussc, D., Willingham, D., Miller, E., Walters, J., Frei, S., Abraham, W., K. (2010). Transforming Education : The Power of ICT Policies. *Oceanus*, *11*(4), 1–8. https://hbr.org/2015/07/why-higher-ed-and-business-need-to-work-together%5Cnhttp://www.unescobkk.org/education/ict/online-resources/databases/ict-in-education-database/item/article/transforming-education-the-power-of-ict-policies-1/%5Cnhttp://www.unesco.o

Njue, M. (2020). *Monitoring and evaluation: Laptop Initiative to be implemented in Kenya*. https://www.academia.edu/6197756/Monitoring_and_Evaluation_of_the_Laptop_Project_Kenyan_Case_study

Oliver, P. (2021). *Using Qualitative Methods to Answer Your Research Question*. McGraw-Hill Education.

Omito, O. (2020). *Readiness of Public Primary Schools for Uptake and Integration of Laptop Computers in Homabay County, Kenya* [Thesis Dissertation, Rongo University]. Kenya. http://repository.rongovarsity.ac.ke/handle/123456789/2511

Republic of Kenya - Ministry of Education Science and Technology. (2015). *Education and training sector gender policy*. Ministry of Education, Science and Technology. http://daogewe.org/index.php/publications/reports/66-gender-policy-guidelines-2015-final/file

Singh, M. N. (2021). Inroad of Digital Technology in Education: Age of Digital Classroom. *Higher Education for the Future*, *8*(1), 20–30. https://doi.org/10.1177/2347631120980272

Singhavi, C., Basargekar, P., & Somaiya, K. J. (2019). Barriers Perceived by Teachers for use of Information and Communication Technology (ICT) in the Classroom in Maharashtra, India. *International Journal of Education and Development Using Information and Communication Technology (IJEDICT)*, *15*(2), 62–78. http://img.asercentre.org/docs/Publications/ASER Reports/ASER 2017/aser2017nationalp

Srivastava, K., & Dey, S. (2018). Role of Digital Technology in Teaching-Learning Process. *IOSR Journal Of Humanities And Social Science (IOSR-JHSS, 23*(1), 74- 88. https://doi.org/10.9790/0837-2301057479

Tikly, L. (2019). Education for sustainable development in Africa: a critique of regional agendas. *Asia Pacific Education Review*, *20*(2), 223–237. https://doi.org/10.1007/s12564-019-09600-5

United Nation. (2015). Sustainable development goals: Improving human and planetary wellbeing. *Global Change*, *1*(82), 20–23. http://www.igbp.net/download/18.62dc35801456272b46d51/1399290813740/NL82-SDGs.pdf

UNESCO. (2013). *Education for all is affordable—by 2015 and beyond. Policy paper 06, for EFA global monitoring report.* UNESCO.

UNICEF-AUC. (2021). *Transforming Education in Africa: An evidence-based overview and recommendations for long-term improvements*. UNICEF-AUC

Vlies, R. (2020). *Digital strategies in education across OECD countries: Exploring education policies on digital technologies*. OECD. https://doi.org/10.1787/19939019

Williamson, G. R. (2004). The A-Z of Social Research: A Dictionary of Key Social Science Research Concepts. *Journal of Advanced Nursing*, *48*(5), 545–545. https://doi.org/10.1111/j.1365-2648.2004.03239_1.x

APPENDICES

Appendix I: Interview Guide for Headteachers

Dear Respondent,

The researcher is a student from Kenya Methodist University undertaking a study on the role of NGOs in bridging the digital literacy gap in public primary schools in Buuri and Isiolo sub-counties, Kenya. Your school is among those selected for the study. Your honest response to the questions posed to you will be highly appreciated. All your responses and information will be treated with confidentiality and only used for educational purposes of the study. Thank you for your anticipated cooperation.

Section A: Biodata

Please put a tick in the appropriate box for each of the statements below.

1. What is your gender? Male [ ] Female [ ]

2. What is your age bracket?

` Below 30 years [ ] 41 - 50 years [ ]

31 - 40 years [ ] Above 50 years [ ]

3. How many years have been Head of the School.

0-5 years [ ] 11 - 20 years [ ]

6 - 10 years [ ] More than 20 years [ ]

4. Which grades (Classes) are receiving digital devices in the sub-county

Grade 1-2 [ ] Grade 5-6 [ ]

Grade 3-4 [ ] Grade 7-8 [ ]

5. In which Sub- County is the school located?

_____

6. How many teachers do you have in your school? _____

7. Does your school have a teacher who supports digital literacy integration?

Yes [ ] No [ ]

8. Is your school sponsored by Lewa or not? Yes [ ] No [ ]

Section B: Interview Guide based on Objectives.

1. What kind of power do you have in your school?

_____

2. Who financed the installation of power in your school?

_____

3. What is the monthly cost of power in the school?

_____

4. Do you have a digital literacy program in the school?

_____

5. If yes to (d) above, do the Grade 6 learners and teachers have access to the resources?

_____

6. What digital gadgets are available to this group and how easily can they access to the gadgets?

_____

_____

_____

_____

7. How many pieces of digital devices & gadgets are there for each type?

_____

_____

_____

8. When did the school first get the digital gadgets?

_____

9. What was the source of digital gadgets?

_____

10. Does the school have internet services?

_____

11. Who financed the setup and installation of the internet?

_____

12. What is your monthly internet cost? _____

13. Who pays the internet bills? _____

14. How is the internet used? for learning and teaching or administration?

Learning [ ] Administration [ ] Both [ ]

15. What is the physical state of digital gadgets in school?

_____

16. Is there safe storage for the gadgets? _____

17. Have there been any cases of theft, breakage, or loss? _____

18. How does/would the school handle cases of theft, breakage, or loss?

_____

_____

_____

19. Does the school have any maintenance and repair programs?

_____

20. Who supports these programs?

_____

21. Have the digital literacy teachers trained?

_____

22. Do digital literacy teachers utilize digital gadgets in teaching?

_____

23. Are all Grade 6 teachers trained on the use of gadgets and access to the digital content?

_____

24. Are there re-training (refresher) training programs?

_____

25. Does the school have dedicated personnel to offer technical support on the use of digital technology?

_____

26. Who supports the training of the technical support personnel?

_____

27. What is the role of the technical support personnel?

_____

_____

28. Are the digital gadgets loaded with relevant and updated content in line with the CBC curriculum designs?

_____

29. Who updates the content?

_____

30. In your opinion, which teaching aid do teachers prefer to use?

Digital content[ ] Books [ ]

31. How do you rate the attitude of Grade 6 teachers towards digital literacy and its integration in teaching/learning?

_____

_____

_____

Conclusion

13. As the overall supervisor of digital learning integration program in the school, what challenges have you encountered in its implementation

_____

_____

_____

14. Is there anything else you would like to add that you think would be beneficial to this research?

_____

Appendix II: Questionnaire for ICT support teachers

Dear Respondent,

The researcher is a student from Kenya Methodist University undertaking a study on the role of NGOs in bridging the digital literacy gap in public primary schools in Buuri and Isiolo sub-counties, Kenya. Your school is among those selected for the study. Your honest response to the questions posed to you will be highly appreciated. All your responses and information will be treated with confidentiality and only used for educational purposes of the study. Thank you for your anticipated cooperation.

Section A: Background Information

Please put a tick in the appropriate box for each of the statements below.

1. What is your gender? Male [ ] Female [ ]

2. What is your age bracket?

` Below 30 years [ ] 41 - 50 years [ ]

31 - 40 years [ ] Above 50 years [ ]

3. How many years have been teaching in the school.

0-5 years [ ] 11 - 20 years [ ]

6 - 10 years [ ] More than 20 years [ ]

4. Who is your employer? TSC [ ] BOM [ ] LEWA [ ]

5. In which Sub- County is the school located?

_____

6. Which grades (Classes) are receiving digital devices in the sub-county

Grade 1-2 [ ] Grade 5-6 [ ]

Grade 3-4 [ ] Grade 7-8 [ ]

7. How long have you been a digital literacy teacher? _____

8. What other lessons do you teach? _____

9. How many lessons do you teach per week? _____

10. Have you been trained on digital learning integration? Yes [ ] No [ ]

11. If yes, who facilitated the training? The government [ ] Lewa [ ] Others [ ]

12. Have you attended any refresher courses on digital integration? Yes [ ] No [ ]

13. If yes, who facilitated the refresher courses?

The government [ ] Lewa [ ] Others [ ]

14. Is your school sponsored by Lewa or not? Yes [ ] No [ ]

Section B: Availability of Digital Learning Infrastructures

Indicates against each statement the extent to which you agree or disagree regarding the availability of digital learning Infrastructure and installations that support digital learning and the devices that facilitate digital learning.

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Agree; and 5=Strongly agree.

Physical Infrastructure

In our School;	**1**	**2**	**3**	**4**	**5**
1. Classes are built of concrete stones, metal doors and windows.					
2. Classes have wiring to support use of digital devices					
3. Classes have Electricity power from Kenya power					
4. Classes have solar powered connection					
5. We have a safe place to store the digital devices					

Access to Devices

In our School;	**1**	**2**	**3**	**4**	**5**
1. Learners can access Tablets and digital Learning devices anytime.					
2. Teachers can access Tablets and digital Learning devices anytime					
3. I have access to a laptop/computer to aid in my support role					
4. I support teachers and learners to use digital gadgets.					
5. I can access the digital devices anytime I need to use them					
6. Digital devices available support audio and video content					

Section C: Functionality of the digital devices

Indicate against each statement the extent to which you agree or disagree regarding the functionality and effectiveness of the available devices.

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Agree; and 5=Strongly agree.

In our school;	**1**	**2**	**3**	**4**	**5**
1. Tablets and digital gadgets are in good condition.					
2. Digital devices deliver teaching/learning activities reliably					
3. Digital gadgets are serviced regularly					
4. Digital gadgets do not hang during the lesson					
5. Digital gadgets suit the CBC teaching and learning needs.					
6. We have a repair and maintenance plan for the gadgets					
7. Digital gadgets are updated and upgraded frequently					
8. I assist with basic repair and maintenance of the gadgets.					

SECTION E: Relevance of digital content

Indicate against each statement the extent to which you agree or disagree regarding the digital content available gadgets and if the content is relevant to the CBC curriculum design.

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Agree; and 5=Strongly agree.

The content in the digital devices	**1**	**2**	**3**	**4**	**5**
1. Is in line with the Grade 6 CBC curriculum design					
2. Is well organized and easily accessible to the teachers and learners					
3. Covers all learning areas in Grade 6					
4. Is ideal for delivering learning interactions in class					
5. Is rich with text, pictures, videos, simulations, and evaluation tests					
6. Is highly interactive and allows active participation of users					

The content in the digital devices	**1**	**2**	**3**	**4**	**5**
7. Is updated regularly to suit the needs of the users and in line with the curriculum design					
8. Is more interactive and engaging than physical book content					

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Agree; and 5=Strongly agree.

The learning platform in the digital devices:	**1**	**2**	**3**	**4**	**5**
1. Enables teachers to create their own content such as videos, animations, pictures, and text					
2. Enables learners to create their own content such as videos, animations, pictures, and text					
3. Gives Learners access to Scratch for practical coding lessons					
4. Learners can use Scratch to carry out innovative coding projects					
5. Allow teachers to deploy quizzes and evaluations digitally					
6. Gives Learners access to storybooks and other reading resources.					

Appendix III: Questionnaire for Grade 6 Class teachers

Dear Respondent,

The researcher is a student from Kenya Methodist University undertaking a study on the role of NGOs in bridging the digital literacy gap in public primary schools in Buuri and Isiolo sub-counties, Kenya. Your school and your class are among those selected for the study. Your honest response to the questions posed to you will be highly appreciated. All your responses and information will be treated with confidentiality and only used for educational purposes of the study. Thank you for your anticipated cooperation.

Section A: Background Information

Please put a tick in the appropriate box for each of the statements below.

1. What is your gender? Male [ ] Female [ ]

2. What is your age bracket?

` Below 30 years [ ] 41 - 50 years [ ]

31 - 40 years [ ] Above 50 years [ ]

3. How many years have been teaching in the school.

0-5 years [ ] 11 - 20 years [ ]

6 - 10 years [ ] More than 20 years [ ]

4. Who is your employer? TSC [ ] BOM [ ] LEWA [ ]

5. In which Sub- County is the school located? _____

6. Which grades (Classes) are receiving digital devices in the sub-county

Grade 1-2 [ ] Grade 5-6 [ ]

Grade 3-4 [ ] Grade 7-8 [ ]

7. How many learners do you teach in Grade 6? Boys _____Girls _____

8. What other lessons do you teach? _____

9. How many lessons do you teach per week? _____

10. Have you been trained on digital learning integration? Yes [ ] No [ ]

11. If yes, who facilitated the training? The government [ ] Lewa [ ] Others [ ]

12. Have you attended any refresher courses on digital integration? Yes [ ] No [ ]

13. If yes, who facilitated the refresher courses?

The government [ ] Lewa [ ] Others [ ]

14. Is your school sponsored by Lewa or not? Yes [ ] No [ ]

Section B: Availability of Digital Learning Infrastructures

Indicates against each statement the extent to which you agree or disagree regarding the availability of digital learning Infrastructure and installations that support digital learning and the devices that facilitate digital learning.

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Disagree; and 5=Strongly agree.

Physical Infrastructure

In our School;	**1**	**2**	**3**	**4**	**5**
6. Classes are built of concrete stones, metal doors and windows.					
7. Classes have wiring to support use of digital devices					
8. Classes have Electricity power from Kenya power					
9. Classes have solar powered connection					
10. We have a safe place to store the digital devices					

Access to Devices

In our School;	**1**	**2**	**3**	**4**	**5**
7. Learners can access Tablets and digital Learning devices anytime.					
8. Teachers can access Tablets and digital Learning devices anytime					
9. I have access to a laptop/computer to aid in my support role					
10. I support teachers and learners to use digital gadgets.					
11. I can access the digital devices anytime I need to use them					
12. Digital devices available support audio and video content					

Section C: Functionality of the digital devices

Indicate against each statement the extent to which you agree or disagree regarding the functionality and effectiveness of the available devices.

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Disagree; and 5=Strongly agree.

In our school;	**1**	**2**	**3**	**4**	**5**
1. Tablets and digital gadgets are in good condition.					
2. Digital devices deliver teaching/learning activities reliably					
3. Digital gadgets are serviced regularly					
4. Digital gadgets do not hang during the lesson					
5. Digital gadgets suit the CBC teaching and learning needs.					
6. We have a repair and maintenance plan for the gadgets					
7. Digital gadgets are updated and upgraded frequently					
8. I assist with basic repair and maintenance of the gadgets.					

Section D: Teacher Capacity Building

Indicate against each statement the extent to which you agree or disagree regarding the training and exposure teachers have been given to help them acquire digital competencies for effective lesson delivery.

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Disagree; and 5=Strongly agree.

In our school,	**1**	**2**	**3**	**4**	**5**
1. I have been trained on how to access and use the digital gadgets					
2. I am well trained and able to train other teachers and learners					
3. I am trained on basic maintenance of the gadgets					
4. I train teachers on basic maintenance of the gadgets					
5. I train learners on basic maintenance of the gadgets					
6. I train teachers and learners to access the digital content					

In our school,	**1**	**2**	**3**	**4**	**5**
7. I train teachers and learners to use the gadgets without aid					
8. We are given regular refresher training					

I can	**1**	**2**	**3**	**4**	**5**
1. Troubleshoot devices whenever they have an issue					
2. Access technical personnel to help if the gadgets or content have an issue beyond my ability					
3. Access gadgets and digital materials with ease					
4. Reset passwords when necessary					
5. Monitor what users are doing with the gadgets					
6. Monitor what users are doing on the platforms they access					

SECTION E: Relevance of digital content

Indicate against each statement the extent to which you agree or disagree regarding the digital content available gadgets and if the content is relevant to the CBC curriculum design.

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Disagree; and 5=Strongly agree.

The content in the digital devices	**1**	**2**	**3**	**4**	**5**
1. Is in line with the Grade 6 CBC curriculum design					
2. Is well organized and easily accessible to the teachers and learners					
3. Covers all learning areas in Grade 6					
4. Is ideal for delivering learning interactions in class					
5. Is rich with text, pictures, videos, simulations, and evaluation tests					
6. Is highly interactive and allows active participation of users					

7. Is updated regularly to suit the needs of the users and in line with the curriculum design					
8. Is more interactive and engaging than physical book content					

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Disagree; and 5=Strongly agree.

The learning platform in the digital devices:	**1**	**2**	**3**	**4**	**5**
1. Enables teachers to create their own content such as videos, animations, pictures, and text					
2. Enables learners to create their own content such as videos, animations, pictures, and text					
3. Gives Learners access to Scratch for practical coding lessons					
4. Learners can use Scratch to carry out innovative coding projects					
5. Allow teachers to deploy quizzes and evaluations digitally					
6. Gives Learners access to storybooks and other reading resources.					

Appendix IV: Questionnaire for Grade 6 Learners

Dear Respondent,

The researcher is a student from Kenya Methodist University undertaking a study on the role of NGOs in bridging the digital literacy gap in public primary schools in Buuri and Isiolo sub-counties, Kenya. Your school and your class are among those selected for the study. Your honest response to the questions posed to you will be highly appreciated. All your responses and information will be treated with confidentiality and only used for educational purposes of the study. Thank you for your anticipated cooperation.

Section A: Background Information

Please put a tick in the appropriate box for each of the statements below.

1. What is your gender?

Male [ ] Female [ ]

2. What is your age bracket?

` Below 12 years [ ] 13 - 14 years [ ]

12 - 13 years [ ] Above 14 years [ ]

3. In which Sub- County is the school located? _____

Please tick the answer that best describes your experience.

Technology in classroom

4. Do you ever use computers, smartboards, or tablets in your classroom?

Yes [ ] No [ ] I don't know [ ]

5. How often do you use computers, smartboards, or tablets in your classroom?

Everyday	[ ]	Less than once a week	[ ]
1 - 3 times a week	[ ]	Never	[ ]
3 - 6 times a week	[ ]		

6. What do you do with computers or tablets in school? (Choose all that apply)

Learn new things.	[ ]	Take tests.	[ ]
Do research for projects.	[ ]	Play educational games.	[ ]
Practice skills	[ ]	Access digital content.	[ ]
Use scratch	[ ]	Watch videos.	[ ]

7. Have you been trained in digital literacy and how to access content?

Yes [ ] No [ ]

8. If yes, who facilitated the training?

The government [ ] Lewa [ ] Others [ ]

9. Is your school sponsored by Lewa or not? Yes [ ] No [ ]

Section B: Availability of Digital Learning Infrastructures

Indicates against each statement the extent to which you agree or disagree regarding the availability of digital learning Infrastructure and installations that support digital learning and the devices that facilitate digital learning.

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Disagree; and 5=Strongly agree.

Physical Infrastructure

In our School;	**1**	**2**	**3**	**4**	**5**
1. Classes are built of concrete stones, metal doors and windows.					
2. Classes have wiring to support use of digital devices					
3. Classes have Electricity power from Kenya power					
4. Classes have solar powered connection					
5. We have a safe place to store the digital devices					

Access to Devices

In our School;	**1**	**2**	**3**	**4**	**5**
1. Learners can access Tablets and digital Learning devices anytime.					
2. Teachers can access Tablets and digital Learning devices anytime					
3. I can access the digital devices anytime I need to use them					
4. Digital devices available support audio and video content					

Section C: Functionality of the digital devices

Indicate against each statement the extent to which you agree or disagree regarding the functionality and effectiveness of the available devices.

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Disagree; and 5=Strongly agree.

In our school;	**1**	**2**	**3**	**4**	**5**
1. I have access to digital gadgets like tablets and computers					

2. The Tablets and digital gadgets are in good condition.					
3. Digital learning tools help me understand my lessons better					
4. I face challenges in using digital learning tools at school					
5. Digital gadgets do not hang during the lesson					
6. I often use digital learning tools for my studies					
7. The technology in my classroom works most of the time					
8. There are enough computers or tablets for everyone in my class to use at the same time.					

Section D: Capacity Building

Indicate against each statement the extent to which you agree or disagree regarding the training and exposure teachers have been given to help them acquire digital competencies for effective lesson delivery.

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Disagree; and 5=Strongly agree.

In our school,	**1**	**2**	**3**	**4**	**5**
1. I have been trained on how to access and use the digital gadgets					
2. My training helped improve my digital literacy skills					
3. I am trained on basic maintenance of the gadgets					
4. Our teachers need more training to use digital learning platforms to teach better.					
5. Exposure to digital learning has helped me to use technology at home.					
6. I would like to pursue a career in technology when I grow up					

In our School;	**1**	**2**	**3**	**4**	**5**

1. I can Troubleshoot devices whenever they have an issue					
2. I can access technical personnel to help if the gadgets or content have an issue beyond my ability					
3. I can access gadgets and digital materials with ease					
4. I can Reset my passwords when necessary					
5. Teachers Monitor what learners are doing with the gadgets					

SECTION E: Relevance of digital content

Indicate against each statement the extent to which you agree or disagree regarding the digital content available gadgets and if the content is relevant to the CBC curriculum design.

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Disagree; and 5=Strongly agree.

The content in the digital devices	**1**	**2**	**3**	**4**	**5**

1. Is well organized and easily accessible to learners					
2. Is rich with text, pictures, videos, simulations, and evaluation tests					
3. Is highly interactive and allows active participation					
4. Makes learning more interesting for me					
5. Is more interactive and engaging than physical book content					
6. Increases my motivation to attend school					
7. Should be increased to make my lessons more interactive					
8. Is in line with what I expected to learn in CBC					

Where 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Disagree; and 5=Strongly agree.

Through the learning platform in the digital devices:	**1**	**2**	**3**	**4**	**5**
1. I can create my own content such as videos, animations, pictures, and text					
2. I can access Scratch for practical coding lessons					
3. Learners can use Scratch to carry out innovative coding projects					
4. Teachers can deploy quizzes and evaluations online					
5. Learners can access storybooks and other reading resources.					

Appendix V: Observation Checklist

Observer Information

Observer's Name: _____

Date of Observation: _____

School Name: _____

Class/Grade Level: _____

Physical Infrastructure

[ ] Classroom is built with concrete stones.

[ ] Classroom has metal doors and windows.

[ ] Classroom has wiring and power sockets.

[ ] Classroom has electricity from Kenya Power.

[ ] Classroom has solar power connections.

[ ] There is a safe place to store digital devices.

Notes:

_____

_____

_____

_____

_____

_____

Observer's Signature: _____ Date: _____

Appendix VI: NACOSTI Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **654470**

Date of Issue: **25/April/2024**

RESEARCH LICENSE

This is to Certify that Miss., Purity Ntinyari Kinoti of Kenya Methodist University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Isiolo, Meru on the topic: THE ROLE OF NGOs IN BRIDGING THE DIGITAL LITERACY ACCESS GAP IN PUBLIC PRIMARY SCHOOLS IN BUURI AND ISIOLO SUB-COUNTIES, KENYA for the period ending : 25/April/2025.

License No: **NACOSTI/P/24/34953**

654470

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions