

BASELINE REPORT

**TRANSFORMING
LEARNING THROUGH ICT
DIGITAL LEARNING
ACCESS IN KENYA**

2024

DISCLAIMER

This baseline study report is made possible by the generous support of ChildFund Korea implemented through ChildFund Kenya. The baseline report's contents have been prepared by Pan African Research Services (PARS Research) and should not be construed as representing the opinions of Childfund Korea or Childfund Kenya.

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This report presents the findings of the Baseline Study of Elimu Kidijitali: Transforming Learning Through ICT Digital Learning Access in Kenya. The overall goal of the study was to assess the digital landscape, and assess the opportunities for 8,300 children to explore, learn and connect safely free from exploitation and harm.

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ACRONYMS AND ABBREVIATIONS

BOMs	Board of Managements
CBC	Competency-Based Curriculum
COVID-19	Novel Corona Virus
DLP	Digital Literacy Programme
DLR	Digital learning Resource
E-Learning	Electronic Learning
FGDs	Focus Groups Discussions
GoK	Government of Kenya
ICT	Information Computer Technology
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KATTI	Kenya Association of Technical Training Institutions
KESSHA	Kenya Secondary Schools Heads Association
KICD	Kenya Institute of Curriculum Development
KIIs	Key Informant Interviews
KPSA	Kenya Private Schools Association
M&E	Monitoring and Evaluation
MoE	Ministry of Education
NACOSTI	National Commission for Science, Technology and Innovation
NESSP	National Education Sector Strategic Plan
NGOs	Non-Governmental Organizations
OCSEA	Online Child Sexual Exploitation and Abuse
PARS	Pan African Research Services
P.K	Peter Kariuki
REREC	Rural Electrification and Renewable Energy Corporation
ST&I	Science, Technology and Innovation
TVET	Technical and Vocational Education and Training
TSC	Teachers Service Commission
TTCs	Teacher Training Colleges
TVs	Televisions
UNODC	United Nations Office on Drugs and Crime
VAT	Value added Tax
WIFI	Wireless Fidelity

EXECUTIVE SUMMARY

About the project

ChildFund Kenya is implementing the project titled **"Elimu KiDijitali: Transforming Learning through ICT Digital Learning Access in Kenya"**. The project was initiated beginning October 1, 2023, and is set to go through to December 31, 2025, spanning a duration of two years and three months. The project focuses on enhancing digital learning access and is set to cover the Nairobi Metropolitan Area, specifically Nairobi, Kiambu, and Murang'a Counties, targeting specific sub-counties within each region.

In Nairobi County, the project is being implemented in Kasarani Sub-County (Njiru Primary School and St. Dominic Primary School); Starehe Sub-County (Mukuru Primary School and St. Catherine Primary School) and Makadara Sub County (St. Elizabeth Primary School). In Murang'a County, the project is in Murang'a South Sub-County (Peter Kariuki (P.K) Primary School and Kangangu; Gatanga Sub-County: Swani Primary School. In Kiambu County; Kikuyu Sub-County: Nderi Primary School and Kikuyu Township Primary.

The project aims to benefit various stakeholders, including learners, teachers and administrators, caregivers, and government officials. The project targets 10,130 individuals directly and 15,800 individuals indirectly.

About the baseline

The primary aim of the baseline survey was to evaluate the digital landscape and opportunities for 8,300 children to safely explore, acquire digital learning skills, and connect without facing exploitation or harm in the online space. The baseline report will serve as a tool for monitoring, and evaluating the project's implementation.

Objectives of This Survey

- i) Assess Current Digital Literacy Levels in primary schools: Determine the existing digital skills and competencies of pupils, teachers, and caregivers.
- ii) Evaluate Access to Digital Devices by learners and teachers in primary schools: Understand the availability and accessibility of digital devices such as computers, tablets, and smartphones for learners and teachers.
- iii) Examine Internet Connectivity in primary schools and homes: Measure the quality and reliability of internet access in schools and homes.
- iv) Identify teachers and caregivers digital Training Needs: Assess the training needs of teachers and caregivers to effectively support digital learning.
- v) Determine Usage of Digital Resources in classrooms and homes: Investigate how frequently and effectively digital learning tools and resources are being used in the classroom and at home.
- vi) Evaluate Educational Content available in primary schools: Examine the quality, relevance, and accessibility of digital educational content available to pupils and teachers.
- vii) Identify ICT Infrastructure Gaps in primary schools: Identify gaps in the physical and technological infrastructure needed to support digital learning.
- viii) Determine the Challenges and Barriers in ICT use: Identify the key challenges and barriers faced by learners, teachers, and caregivers in implementing and engaging with digital learning.
- ix) Evaluate stakeholder Perceptions towards ICT: Assess the perceptions and attitudes of learners, teachers, and caregivers towards digital learning and its impact on education.

Determine the level of ICT policy awareness among the stakeholders in the education sector.

Methodology

The baseline survey utilized a cross-sectional study design, incorporating a mixed methods approach. This approach combined both quantitative and qualitative data collection techniques. Quantitative methods involved face-to-face interviews with caregivers, learners, and teachers. In contrast, qualitative data was gathered through focus group discussions, classroom observations, and key informant interviews with key stakeholders. Additionally, secondary data was sourced from project documents, including the project proposal and pertinent publications.

Demographics.

Teachers

The study reached a total of 30 teachers in Kiambu, Nairobi and Murang'a i.e. 10 teachers per County. In terms of gender, the survey reached more female teachers 57% (n=16) than male teachers 43% (14).

Learners

The survey reached 255 learners across three counties of Nairobi 36% (n=91), Kiambu 32% (n=82) and Murang'a 32% (n=82). In terms of gender, the survey covered 55% (n=141) girls and 45% (n=114) boys.

Caregivers

A total of 63 caregivers were reached, with Murang'a accounting for 35% (22), followed by Kiambu at 33% (n=21), and Nairobi at 32%. (n=20)

Main Findings:

Findings for this baseline survey are presented in the form of the 3 outcomes under the Elimu KiDigitali project, cross cutting issues looking into factors influencing acceptance and adoption of digital learning as well as barriers to implementation of digital learning environments and policies.

1.0. Findings Under Outcomes

Outcome 1: School communities have improved digital learning environments.

Under this outcome, the baseline study sought to understand the extent to which schools had established digital learning environments.

1.1. Proportion of schools which have established digital learning environments

Digital Learning Environments: the ecosystem of digital tools, resources, materials, and related technologies that support the many pathways of teaching and learning.

In response to inquiries regarding the adequacy and reliability of computer devices, electricity, internet connectivity, and network reliability, teachers provided ratings. The aggregated responses revealed that 34% (n=10) of teachers either agreed or strongly agreed with the assessments of availability and reliability. Similarly, learners were asked about the devices they used in digital learning, including devices such as laptops, tablets, and smartphones, and engagement with approved digital content. Upon evaluating these factors, the average rating was found to be 44%. (n=13). Additionally, 89% (n=227) of learners reported engaging in 0-3 digital lessons per week. Furthermore, a total of 95% (n=242) of learners indicated having interacted with some form of digital learning tools. These high interaction levels indicate that all schools have some form of established digital learning environments. There was high interaction with digital resources in learning.

However, unreliable electricity and poor internet connection were singled out as challenges which might hinder digital learning education.

Outcome 2: Learners have increased access to quality digital learning services.

Digital-based pedagogy refers to the use of digital technologies for educational purposes such as in teaching, learning, assessment or for educational purposes (Istrate, 2022).

2.1. Percentage of teachers applying digital-based pedagogy in the classroom

The percentage of teachers applying digital-based pedagogy in the classroom was calculated as the percentage of teachers who used digital learning tools and resources **always** or **often**. Therefore, 44%, $n=14$ (62%, $n=9$ male and 38%, $n=5$ female) of all interviewed teachers used digital-based pedagogy in the classroom. The survey established that to some extent, all of the interviewed teachers for this baseline study applied digital learning tools at some point in the classroom, in their lesson plans and teaching practices.

Confidence in the usage of digital devices

When asked about their confidence in using modern technologies for teaching and learning, 50% ($n=15$) of the teachers were neutral, 33% ($n=10$) had high confidence while 17% ($n=17$) had very high confidence. Teachers who had high or very high confidence in the use of modern technologies for teaching and learning mainly attributed this to hands on experience in the use of digital learning tools and administrative support and encouragement for technology integration initiatives. Other notable reasons for the high confidence levels included comprehensive training on their use and the gradual use of digital resources in learning.

The main challenges to implementing digital based pedagogy in the selected schools was stated as unreliable internet to support digital learning in schools as per 67% ($n=20$) of interviewed teachers, especially in Murang'a where 100% ($n=10$) of the teachers identified this as a major challenge. Inadequate digital learning resources was also a problem as per 63% ($n=19$) of the teachers.

2.2. Proportion of caregivers with increased knowledge, positive attitude and practices regarding digital learning, OCSEA and online child safety.

Digital learning resources

95% ($n=242$) of all the interviewed school children had interacted with digital learning resources hence had some knowledge on their usage. The use of digital learning resources had improved and greatly improved the learning experience of 97% ($n=247$) of school children. This improvement was due to the fact that the children found the use of digital learning resources to be more interactive as they were able to search online for anything and some lessons such as blood circulation were animated, giving the children a much clearer contextualization of the process.

OCSEA and online child safety

In regard to OCSEA and online safety, only 34% ($n=86$), 57%, $n=37$ female and 43%, $n=49$ male of the interviewed school children had an idea on the meaning of OCSEA. 62%, $n=158$ (53%, $n=62$ male, 47%, $n=96$ female) of the children felt that OCSEA was unlikely and extremely unlikely to happen to them. 64%, $n=162$ of the children related to the internet and online access having only positive impacts due to improved digital literacy. 33%, $n=83$ of the children thought the internet and online access had both positive and negative impacts while 4%, $n=10$ felt that it had had only negative impacts or no impact at all. 59% ($n=151$) of the children also reported they were likely or very likely to report to teachers or caregivers if they found something harmful on the internet. At school, internet and online access was restricted to only for specific lessons whereas in class, teachers were able to use a single tablet to monitor the children's devices hence limiting the dangers associated with unrestricted internet access thus contributing to online child safety. At home, caregivers installed passwords and monitored their children's

access to the internet both in terms of the amount of time spent online as well as what the children were searching up on.

Perception of school children on the quality of digital learning services

The overall quality of digital learning as perceived by school children was low. The schools were noted to have many challenges that hindered quality digital learning resources, such as inadequate digital learning tools, poor internet connectivity and unreliable electricity or power sources.

2.3. Proportion of caregivers with increased knowledge, attitude and practices regarding digital learning, OCSEA and online child safety.

***please note that the sample of male caregivers was much lower than that of female caregivers (11 vs 52) hence percentages between the genders are presented as a proportion within the gender.*

Digital learning resources

Most, 78%, $n=49$ of the interviewed caregivers (91%, $n=10$ of all males, 75%, $n=39$ of all females) had seen their school going children interact with digital learning tools, especially smart phones (88%, $n=43$) at home. 86%, $n=54$ (91%, $n=10$ of all males, 85%, $n=44$ of all females) of the caregivers stated that they normally support their children in accessing online resources and using digital tools for schoolwork. The support was shown mainly through the provision of phones and data bundles to access the internet. As a result of using digital learning tools, 82%, $n=52$ (100%, $n=11$ male, 79%, $n=41$ female) of the caregivers felt their children's learning experience had improved/greatly improved.

OCSEA and Online Child Safety

Only 40%, $n=25$ of the caregivers were familiar with the term OCSEA mostly (60%, $n=15$) describing it as 'sexual materials online that a child can access and may have negative consequences to them'. 37%, $n=23$ of the caregivers were aware of the potential dangers associated with accessing the internet and online pages such as exposure to inappropriate materials, cyberbullying and phone/internet addiction. Some of the caregivers took measures such as monitoring phone/internet usage, installing passwords as well as encouraging the children not to keep away from any unsavory materials on the internet. Some of the caregivers however expressed that they were not as conversant with the use of smartphones as their children and that they were not able to monitor their children as well as they would have liked.

Outcome 3: Improved legal and policy environments in favor of digital learning.

Number of digital learning policies developed.

Numerous digital learning policies have been formulated over time such as National Curriculum Policy, 2018, The National ICT Policy, 2019, The National ICT Master Plan, 2014-2017, The National Education Sector Strategic Plan (NESSP), 2023-2027 and the Policy on ICT integration in Education and Training. There have also been Acts of Parliament that guide how learning should be conducted in Kenya, these include; The Kenya Institute of Curriculum Development Act, 2013 as a statutory body responsible for curriculum development with its functions and The Science, Technology and Innovation (STI) Act, 2013: While these policies exist, their application has been spasmodic, as such there have been low level of policy awareness among the respondents interviewed. The full implementation of these policies has been hindered by inadequate financial resources.

Effectiveness of the existing policies in promoting use of digital learning resources

In Curriculum Integration: the policies have been effective since they all provide for the legal framework for developing and implementing digital learning. The only downside of these policies is the failure to fully implement them due to inadequacy of financial resources.

Cross-Cutting Issues

How do cultural factors influence the acceptance and adoption of digital learning practices?

In this baseline context, the study found that cultural factors did not exert any negative influence on the adoption of digital learning practices among community members. Throughout the research period, no instances were identified where cultural norms or values discouraged community members from embracing their children adopting digital learning environments.

Major Barriers to Implementing Digital Learning Environments and Policies

i) Poverty.

Economically vulnerable families often lack wealth and face educational disparities. Inadequate resources to access digital learning resources like tablets, computers and SMART boards was cited by 83% of the teachers and 67% of caregivers. This situation results in households affected by poverty having limited access to digital devices such as smartphones, computers, TVs, and radios.

“At times the children’s needs are not all fulfilled, the child may want something which most caregivers from this area may not provide, there is also school demands such as money and this lack may lead to the child having problems in their education”. **FGD P.K Primary School**

“As a parent, I do not have even a smartphone or TV and I cannot help my child do his homework, so I send them to someone else who might have a phone or TV for their homework.” **FGD P.K Primary School**

Learners in schools from rural or economically unviable regions experience challenges, particularly concerning access to internet and online education, as earlier noted.

ii) Internet Connectivity

Poor internet connectivity was also cited by 40% (n=30) of teachers as another hindrance to digital learning. This highlights the critical need for improved infrastructure to support reliable internet access in educational settings. There were some differences from the counties with Nairobi and Murang’a leading with 50% (n=5) and 47% (n=4) respectively whereas in Kiambu the figure was a bit lower at 22% (n=2) unreliable internet connectivity and accessibility further prevent learners from poor backgrounds from interacting with digital learning devices, putting them at a disadvantage compared to learners from wealthier families who have access.

iii) Low/Average confidence levels in their ability to teach using digital resources

The study found out that many teachers rated themselves average 50% (n=15) in terms of confidence in using digital tools and online platforms for teaching. This average confidence is primarily due to inadequate training and refreshers capacity building, leading to moderate confidence in integrating digital tools ICT into their teaching practices.

iv) Inadequate digital literacy skills and Insufficient technical support

Approximately 33% (n=10) of teachers cited inadequate digital literacy skills as well as insufficient technical support for the teachers provided a barrier, underscoring the necessity for targeted training programs aimed at improving educators' proficiency in utilizing digital tools for teaching purposes. Only 13% (n=5) cited to have been trained.

v) Poor network connectivity

Network connectivity issues were identified as a significant obstacle to the implementation of digital learning, with 10% of teachers, 19% of learners and 24% of caregivers reporting poor network connectivity in their respective areas.

Conclusions

A proficiency gap persists among teachers, leading to low confidence levels, as many teachers reported having only average confidence in using digital resources in learning.

Despite the government's flagship initiative, the Digital Literacy Programme (DLP), launched in 2013, there are still existing gaps such as unreliable electricity supply, inadequate devices for learners and availability of the teachers and school leadership trained on ICT integration this hinders access and effective use of digital learning technology.

Resource inadequacy among most caregivers interviewed poses a significant obstacle to digital learning, particularly for learners in rural and informal sectors, inhibiting their interaction with digital devices at home.

The study established widespread engagement with digital learning resources among learners, with 95% reporting interaction.

Digital devices such as tablets, laptops, and smartphones were prevalent among learners in surveyed schools.

Power outages were a concern, with limited backup options in schools.

Similarly, internet connectivity was rated low by learners and teachers, with issues including slow speeds and limited coverage within schools, impacting the effective use of digital resources.

Both learners and teachers acknowledged the positive impact of digital learning environments on overall learning experiences.

Teachers identified several challenges in implementing and maintaining digital learning environments, including limited resources, poor internet connectivity, restricted access to digital resources, lack of electricity, and insufficient technical support.

Victims of OCSEA often suffer from long-lasting psychological trauma and mental health issues. Access to appropriate support services is crucial for their recovery.

We are however lucky that Kenya has laws criminalizing child sexual exploitation, including the Sexual Offences Act and the Children's Act. However, enforcement and prosecution of offenders remain a challenge.

There were significant gender disparities in the utilization of digital devices for educational purposes. Males exhibit a notably higher frequency of device usage 62% (n=8) compared to their female counterparts at 30% (n=5).

Based on the findings of the survey, 34% (n=86) of participants demonstrated familiarity with the term OCSEA. This baseline knowledge underlines the reasonable understanding of the concept at the project onset.

Through vigilant monitoring of internet usage by teachers and restricting access to specific classes, coupled with centralized tablet management, potential exposures to inappropriate content are minimized.

Nairobi and Kiambu were almost at par regarding state of infrastructure for instance in schools we visited in the 2 counties, had established computer labs with some form of internet connection. The case was different for Murang'a as the schools visited did not have computer labs and had no internet.

Recommendations

1. Given the average confidence levels among teachers in digital learning it is imperative for the project to prioritize teacher training within professional development programs focused on digital literacy.
2. The project should also sensitize the schools through BOMs to factor in their budget's alternative sources of power such as solar power with support from the government through funds like NG-CDF to establish alternative power solutions to ensure uninterrupted digital learning in schools.
3. Due to poor internet access, it is vital for the project to strengthen collaboration and partnership with stakeholders to prioritize efforts to facilitate the acquisition of reliable internet connectivity.
4. Increasing last mile coverage for electricity is indispensable for digital learning.
5. Considering the prevalent issue of inadequate resources affecting most caregivers in the three counties, community partnership programs should be started. The government should also provide subsidies for locally assembled digital devices, such as tablets or laptops, to learners from low-income families, ensuring equitable access to essential technology for digital learning.
6. Owing to the fact that, the low level of policy awareness among the respondents interviewed, ChildFund and other education stakeholders should organize educational initiatives and outreach programs to raise awareness about existing policies through workshops, seminars, and public campaigns. There should also be stakeholder engagement, especially with key figures such as community leaders and civil society organizations, to enlist their support in promoting awareness of these policies.
7. Given the limited funding for device maintenance, it is recommended that Boards of Management (BOMs) and school administrations proactively allocate an internal budget for device repairs and maintenance. This step is crucial to ensure the sustainability of the project.
8. Due to insufficient technical support cited by teachers 20% (n=6) to strengthen the technical support; there is need to establish dedicated technical support channels within educational institutions to provide teachers with timely assistance for troubleshooting technology-related issues.
9. There is need to enhance educational initiatives focused on online safety, particularly targeting the remaining 66%.
10. There is equally need to implement robust monitoring systems, and restricting access to age-appropriate content in schools.

CHAPTER I: BACKGROUND

1.1. Background

In 2012, the Government of Kenya recognized the transformative potential of digital technology in enhancing teaching and learning, improving access to education, boosting learning outcomes, and preparing young people for the digital age. The Digital Literacy Programme (DLP), a flagship initiative launched in 2013, aimed to usher in an era of interactive, student-centered teaching, freeing teachers to mentor pupils and focus on their core educational roles. This monumental undertaking required complex multi-sectoral collaboration, significant public and private investment, and a willingness from the entire education system to shift mindsets and practices¹.

After internal planning, coordination, and a brief pilot with 150 schools, the programme was launched nationwide in 2016. In the six years since, the country has experienced significant changes in the digital and educational landscapes. Improvements in digital infrastructure and increased mobile and internet penetration have supported the DLP's efforts. However, challenges such as inadequate e-learning infrastructure and ICT devices, inadequate financial resources, poor internet connectivity, inadequate technical skills by teachers and longer time required to develop e-learning content. Additionally, the global COVID-19 pandemic also exposed gaps that need to be addressed for the country to fully realize the digital future envisioned by President Kenyatta.

Digital Literacy Programme Milestones

There have been significant efforts from across the technology and education ecosystems to enable digital learning to occur. Initiatives to date have focused on **4 key areas**: Policy, Infrastructure, Teacher Capacity and Content.









			
Policies created and evolved to support ICT integration into teaching and learning, from 2005 to the present	22,891 public primary schools have been installed with 1,170,846 digital devices	22,927 schools have been connected to power	216 schools have been connected to internet
			
201,811 digital learning and teaching devices assembled locally at JKUAT and Moi University plants.	229,000 teachers have been trained on ICT integration in learning	93,009 teachers trained on use of ICT and device utilization	Kenya Education Cloud has interactive digital content for traditional and special needs learners

Figure 1: Digital Literacy Programme Milestones

¹ <https://edu-design.co/wp-content/uploads/2019/09/Digital-Literacy-Programme.pdf>

Source: Data sources: DLP summary reports, Kenya Digital Master Plan, GIGA Project School Connectivity Dashboard, 2019

Covid 19 pandemic accentuated the need to embrace online learning through application of DLP, the Government adopted remote teaching to support distance learning and online education and this was to be delivered through radio, television and internet. However, learners from poor, vulnerable and marginalized households had no financial muscle to access these mediums of learning availed and this further worsened the inequality in excess of quality of education (MoE,2020)².

1.2. About the Project

Elimu KiDijitali: Transforming Learning through ICT Digital Learning Access in Kenya is a 1st October 2023 to 31st December 2025 (2 years, 3 months) project being implemented by Childfund Kenya³. The project covers the Nairobi Metropolitan Area and comprises of Nairobi, Kiambu and Murang'a Counties in the following Sub counties:

1. **Nairobi County** -Kasarani Sub-County (*Njiru Primary School & St. Dominic Primary School*), Starehe Sub-County – (*Mukuru Primary School & St. Catherine Primary School*), Makadara Sub County (*St. Elizabeth Primary School*).
 2. **Murang'a County** - Murang'a South Sub- County (*P.K Primary School & Kangangu*), Gatanga Sub-County (*Swani Primary School*).
 3. **Kiambu County** -Kikuyu Sub- County (*Nderi Primary School & Kikuyu Township Primary*).
- The project targets: children/learners (Boys and Girls), teachers & Administrators (Male/Female), Caregivers (Male/Female) and Government officials (MoE/ICT) and is expected to reach a total of 10,130 directly and 15,800 individuals by 2025.

Table 1: Targeted beneficiaries

Group	Direct			Indirect
	2023	2024	2025	2024
Year				
Children (Male/Female)		Male-4,500 Female-3,800		Male-7,800 Female-7,900
Teachers & Administrators	Male- 40, Female-40			Male-50, Female- 50
Caregivers (M/F)		Male- 400, Female-400	Male- 400, Female-400	
Government officials	Male70, Female- 80			
Total	230	9,100	800	15,800

The main project partners include the Ministry of Education, Kenya Institute of Curriculum Development (KICD), Community and School Board of Management, with their roles as detailed below:

² Dr. Areba George Ngwacho (2020) COVID-19 Pandemic Impact on Kenyan Education Sector: Learner Challenges and Mitigations, (*journal for research implications and practice*) (Vol.4)-12

³ Elimu KiDijitali Project proposal

Table 2: Stakeholder roles

Partner	Role
MoE	<ul style="list-style-type: none"> Managing and funding primary schools. Coordinates implementation of education curriculum for all education levels. Formulation of education policies.
KICD	<ul style="list-style-type: none"> Agency in Kenya responsible for developing and revising the country's curriculum for pre-primary, primary, secondary, and teacher education levels. It operates under the Ministry of Education and plays a critical role in shaping the educational content and standards in the Kenyan education system.
Community:	<ul style="list-style-type: none"> To promote ownership and sustained commitment..
School board of management	<ul style="list-style-type: none"> Management of education institution on behalf of the community and the Ministry of Education

In line with ChildFund's strategy, the organization seeks to ensure that children achieve optimum development and grow up healthy, educated, skilled, and safe. However, there are challenges such as inadequate digital literacy and pedagogical skills, limited quality and locally relevant digital content. Additionally, Schools are struggling to access appropriate educational software and digital textbooks, inappropriate ICT training for teachers to cascade the knowledge to children and lack of adequate, ICT funding led to the creation of the Elimu KiDijitali project that aims to:

- Provide digital learning content and devices to 10 schools located in Nairobi, Kiambu and Murang'a Counties. Learners will be equipped with tablets while their teachers will be provided with laptops, whiteboards and projectors for displaying learning content.
- The project to facilitate equitable and inclusive gender-balanced participation and access to digital learning through a responsive and inclusive gender mentorship and role modelling teaching lessons for increased digital learning programs for all learners.
- Provide comprehensive classroom management software that will enhance the overall learning experience.
- Provide internet connectivity that further enriches the learning environment by providing access to a vast range of online educational resources.
- Train caregivers, teachers and learners drawn from the 10 targeted schools on Online Child Sexual Exploitation and Abuse (OCSEA) and Online Safety so as to improve children's self-protection skills and parent's/ caregivers' knowledge attitudes, practices on OCSEA and online safety.
- The project will equitably engage caregivers, teachers and learners throughout the project cycle, as agents of positive change in their communities. Trainings for caregivers will target both male and female without bias. The project will ensure equitable and inclusive enrolment of boys and girls.

Additionally, the project will endeavor to ensure that informational, environmental, physical, and attitudinal barriers do not hinder learners with disabilities from participating in education. Training content for teachers will incorporate components that will equip all teachers to appropriately respond to diversity in the classroom and disability inclusion. Children with disabilities and their caregivers in the selected target areas will be mapped and prioritized for targeted special support.

1.3. About the Baseline Evaluation

The main objective of the baseline survey was to assess the digital landscape environment and opportunities for 8,300 children to explore, learn and connect safely free from exploitation and harm. The baseline report is to be used for monitoring, benchmarking and evaluating the project implementation. Several objectives will be determined to see the results into below mentioned areas;

1. School communities have improved digital learning environments.
2. Learners have increased access to quality digital learning education services.
3. Improved legal and policy environments in favor of digital learning.

CHAPTER 2: METHODOLOGY

The baseline survey adopted a cross-sectional study design, using a mixed methods approach. This included both quantitative and qualitative data collection techniques. The quantitative methods entailed face to face interviews with caregivers, learners (pupils) and teachers. Moreover, qualitative interviews were attained through focus group discussions, classroom observations, and key informant interviews with key stakeholders. Nonetheless, secondary data was obtained from project documents such as the project proposal and relevant publications.

2.1. Data Collection

Table 3: Samples Achieved

County	School	Pupils	Caregivers	Teachers	Classroom observation
Kiambu	Kikuyu Township				
	Target	40	10	5	
	Achieved	42	10	5	1
	Nderi Primary				
	Target	40	10	5	
	Achieved	40	10	5	2
Total		82	20	10	3
Murang'a	P.K primary				
	Target	40	10	5	
	Achieved	40	11	5	1
	Swani Primary				
	Target	40	10	5	
	Achieved	42	11	5	2
Total		82	22	10	3
Nairobi	St. Dominic				
	Target	30	5	4	
	Achieved	30	5	4	4
	St. Catherine				
	Target	30	7	3	
	Achieved	30	7	3	2
	St. Elizabeth				
	Target	30	8	3	
Achieved	30	8	3	2	
		90	20	10	8
Total		255	63	30	8

Data collection commenced on 21/05/2024 in all three counties (Nairobi, Kiambu and Murang'a) where the project is to be implemented. Three teams were constituted, each collecting data in a county hence data collection in all the three counties was done concurrently.

2.1.1. Quantitative data

Quantitative data was collected using face-to-face surveys conducted with teachers who taught grades 4 to 8, learners who studied in grades 4 to 8 and caregivers who had learners in the respective schools of project implementation. Random sampling ensured unbiased selection of participants from grades 4 to 8, while purposive sampling was used for teachers and caregivers who had children in the targeted schools. Cumulatively, 255 interviews with learners, 63 with caregivers, 30 with teachers and 8 observations were achieved. The table below highlights the targeted versus achieved quotas during the quantitative phase:

2.1.2. Qualitative data

Qualitative data was obtained through Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). Six FGDs were achieved through round table discussions with school children and caregivers in the respective schools, whereas 21 KIIs were attained through in-depth interviews with head teachers, BoM members, Ministry officials, among others. Moderators for the KII and FGD sessions were encouraged to record the interviews and discussions with the consent of respondents. The discussions and interviews were later transcribed to ensure that there was no loss of information. The table below presents the distribution of FGDs and KIIs in the respective schools and counties.

Achieved FGDs

All six FGDs were attained with caregivers and pupils across the three counties of assessment.

Table 4: FGD table

County	Description	Target		Achieved
		Caregivers	Pupils	
Kiambu	Kikuyu Township (Caregivers) Nderi Primary (Pupils)	1	1	2
Murang'a	P.K Primary (Caregivers) Swani Primary (Pupils)	1	1	2
Nairobi	St. Dominic (Caregivers) St. Catherine (Pupils)	1	1	2
TOTAL		3	3	6

Achieved KIIs

A total of 21 KIIs were achieved, against a target of 22 KIIs. Only one KII with the Kenya Institute of Curriculum Development (KICD), was not achieved due to unavailability of the respondent, even after multiple follow ups.

Table 5: KIIs achieved

County	Description	Target		Achieved
		HTs	BOM	
Kiambu	Kikuyu Township (Head teacher) Nderi Primary (Head teacher & BOM)	2	1	3
Murang'a	P.K Primary (Head Teacher) Swani Primary (Head teacher & BOM)	2	1	3
Nairobi	St. Dominic (Head Teacher) St. Catherine (Head teacher & BOM) St Elizabeth (Head Teacher & BOM)	3	2	5
Other key	KII with E-learning Publisher, TSC, MoE Nairobi, MoE Kiambu, MoE Muranga, ICT	11		10

stakeholders	Nairobi and ICT Kiambu, CBO and KICD, Project Staff.		
TOTAL		22	21

2.1.3. Informed Consent

Before conducting any interviews, the research team obtained consent from all participants to ensure their approval for participation in the survey. For minors (learners under the age of 18), consent was sought from their teachers at school and assent from the learners themselves before they were allowed to participate in the study. The consent-seeking process included the following steps:

- The name of the researchers and their role in the project/study;
- The purpose of the study;
- The voluntary nature of their participation in the study, informing them that they can choose to participate, refuse to participate, or withdraw from the study with no negative repercussions;
- An explanation of the process and format of the study;
- The anonymity and confidentiality of their participation in the study.

Participants had the right to refuse to participate in data collection activities. They were informed that this would not affect their ability to participate in the overall project.

2.2. Data Collection Team

Prior to the data collection, a field team consisting of 16 enumerators and 3 supervisors were recruited for data collection. The team leaders, enumerators and moderators for this baseline study were required to have; at least tertiary level education, proficiency in reading, writing and speaking in Swahili and English and had conducted surveys for at least one year.

The field team was then taken through rigorous training by PARS team 20/05/2024. The training involved but was not limited to;

- Survey etiquette
- Interview consent
- Questionnaire administration
- Reporting requirements
- Lines and manners of communication amongst others

2.2.1. Overview of Training Activities

The overall objective of the training was to:

- 1) Explain the rationale and objectives of the survey.
- 2) Ensure uniform application of the survey materials and procedures.
- 3) Offer practical solutions to expected challenges
- 4) Improve the overall quality of data.

The training was comprised of two parts.

- **Theoretical:** Review the theory of the questionnaire and each question to fully understand each question's objective. Standard quantitative interviewing techniques and field protocols were also covered.
- **Practical:** Individual and group exercises were held so that enumerators could become familiar with the practice of collecting information and administering the questionnaires. This part of the training

included in-class demonstrations, where the question was shared on screen and one enumerator completed the questionnaire in front of the dummy classroom.

Following the training, the enumerators were evaluated based on their understanding of the questionnaire and their ability to correctly conduct interviews using the same test scenarios as used in the dummy classroom practice.

2.3. Baseline Study Challenges and Limitations

1. Reluctance of some teachers to participate in the study:

Some teachers in Murang'a County declined to participate in the survey. This reluctance stemmed from apprehensions that the classroom observation results would be shared with their employer, the Teachers Service Commission (TSC). Such concerns regarding confidentiality and potential repercussions of sharing observational data with the employer significantly impacted the willingness of certain teachers to engage in the survey process. However, through engaging the school head and explaining to the anonymity nature of the study and explaining the principle of "DO NO HARM" they later accepted to take part.

2. Unavailability of Key Informants:

Another significant drawback was the unavailability of critical key informants, particularly with key stakeholders such as the Kenya Institute of Curriculum Development (KICD). Despite diligent efforts to schedule and conduct these interviews, planning challenges arose, and the individuals responsible were unavailable during the survey period. The absence of insights from key informants like the KICD may have hindered the depth and breadth of understanding regarding curriculum development and educational policies. However, we have tried to cover the gaps arising through extensive desk review of this government agency and other areas the baseline team felt was key to getting the information.

3. Interference of Examination Schedules:

Additionally, the survey fieldwork period coincided with examination preparations in Nairobi and Kiambu Counties, while in Murang'a County, learners were already actively engaged in exams. This convergence of examination schedules posed a significant challenge to the execution of classroom observations. Consequently, the interference of examination schedules may have compromised the accuracy and validity of the observational data collected during the survey. To mitigate this, we organized revisits by the team after the conclusions of the exams.

It is important to acknowledge these limitations transparently to provide context for interpreting the survey findings accurately. Despite these challenges, the survey findings still offer valuable insights into the digital learning landscape of the 3 counties of Nairobi, Kiambu and Murang'a.

In future, it is important to coordinate survey schedules with targeted schools and key stakeholders/Institutions to avoid conflicts of interests to ensure a flawless and more representative study.

CHAPTER 3: FINDINGS

3.1. DEMOGRAPHICS

In a nutshell, a total of 30 interviews with the teachers, 255 with learners, and 63 with caregivers, were attained

Table 6: Achieved quantitative quotas of the study

Group	Quantitative
Learners	255
Teachers	30
Caregivers	63
TOTAL RESPONDENTS	348

3.1.1. Teachers

The study targeted 30 teachers from Kikuyu Sub- County in Kiambu County; (n = 10, 33%,) while in Nairobi the study covered Makadara Sub- County (n=5, 17%) and Kasarani Sub-County (n=5, 17%) and Murang'a county, particularly Murang'a South (n=5, 17%) and Gatanga (n=5, 17%). Female teachers comprised more than half of the sample (n=17, 57%) whereas males accounted for slightly less than half (n = 13, 43%).

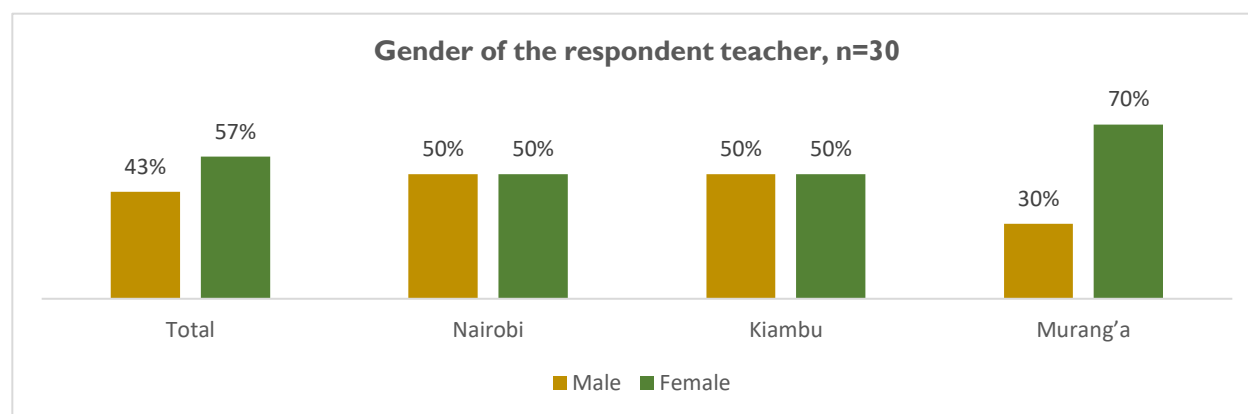


Figure 2: Teachers Gender

The majority of the teachers engaged were grade 8 teachers (n=8, 27%) followed by grade 7 (n=6, 20%), Grade 6 (n=5, 17%), Grade 5 (n=5, 17%), Grade 4 (n=2, 7%), and Grade 3 & below (n=4, 13%).

3.1.2. Learners

The survey targeted 255 learners across three counties of Nairobi (n= 91, 36%), Kiambu (n = 82, 32%) and Murang'a (n = 82, 32%). In terms of gender, the survey covered 55% of girls (n=141) and 45% boys (n=114) boys. In terms of age, slightly more than three quarters (n = 194, 76%), of the surveyed learners were 11-14 years, followed by those below 10 years (n=45, 18%) and those aged between 15 -18 years (n=16, 6%).

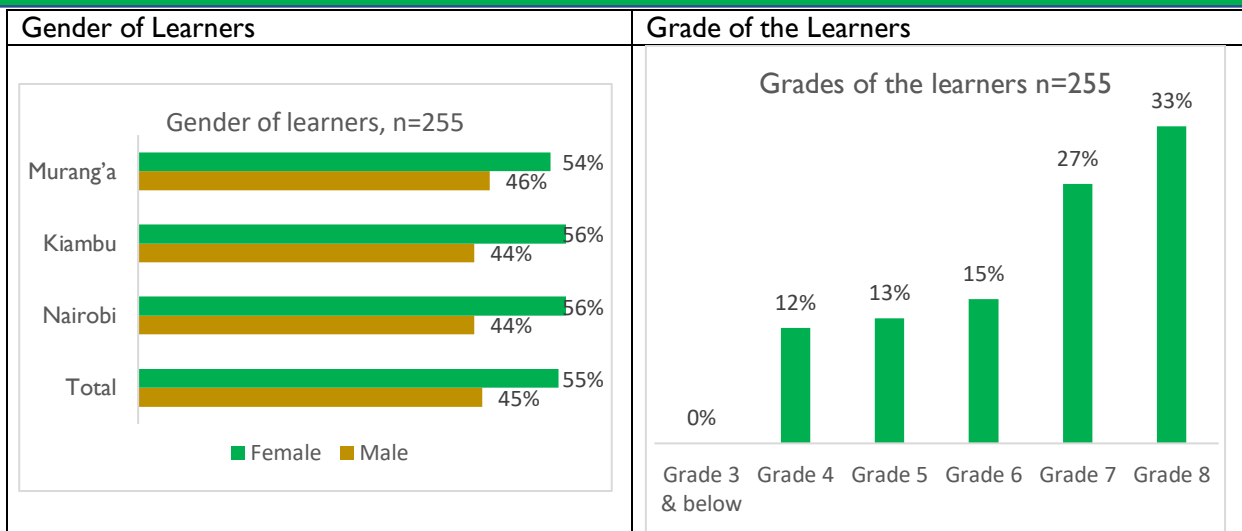


Figure 3: Gender and Grades of learners

Figure 4: Caregivers of children in specific grades

3.1.3. Caregivers

A total of 63 caregivers were surveyed, with Murang'a accounting for 35% (n =22) of the respondents, followed by Kiambu at 33% (n =21) and Nairobi 32% (n =20). The surveyed caregivers comprised 83% females (n =52) and 17% male caregivers. In terms of grade, 19% of caregivers interviewed had children in grade 8 (n =12), 14% in grade 7 (n=9), 16% in grade 6 (n=10), 11% in grade 5 (n =7), 2% in grade 4 (n =1) and 25% in grade 3 and below (n=16). 13% of caregivers interviewed had children in more than one grade (n=8) In terms of age, the survey covered 5% of caregivers aged 21 -30 years (n =3), 56% aged 31 - 40 years (n = 35), 30% aged 41 -50 years (n =19), 6% aged 51 -60 years (n=4) and 3% who were 61 years and above (n =2).

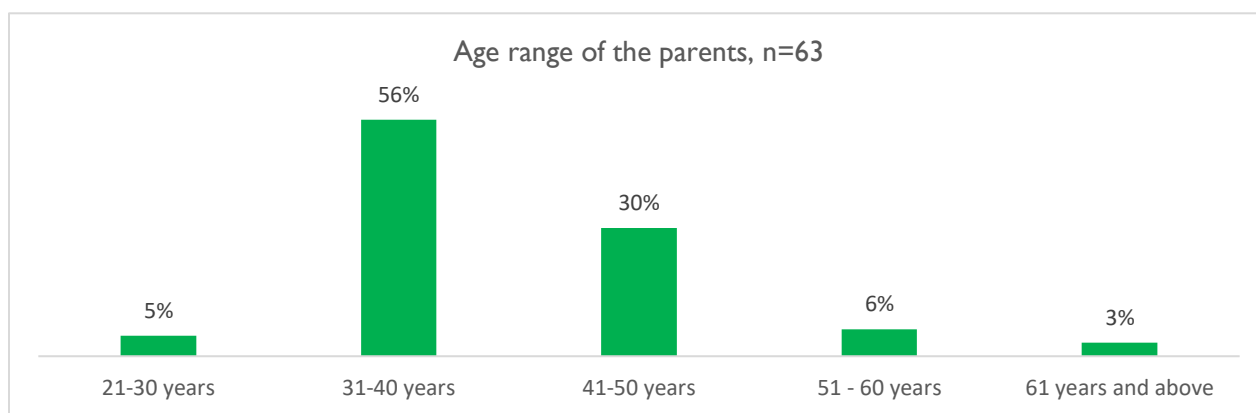


Figure 5: Caregivers age range

3.2. MAIN FINDINGS

3.2.1 Outcome I: School communities have improved digital learning environments.

Proportion of schools which have established digital learning environments.

Numerator: Total number of schools with digital equipment, teachers and school leadership trained on ICT integration and school leadership providing curriculum support; **Denominator:** total number of targeted schools.

An established digital learning environment refers to a learning environment that exhibits the desired levels of enhanced and optimized digital tools, resources, and infrastructures. It entails creating a more effective, inclusive, and secure online learning experience for learners, teachers, and staff, to enhance the educational experience, making learning more engaging, personalized, and effective. The key components of a well-established digital learning environment in school communities include interaction with digital learning resources, availability of digital devices, access to electricity, internet connectivity and network connectivity. Detailed findings are as presented below:

I. Interaction with Digital Learning Resources

The findings from the baseline survey underscore the widespread interaction of learners with digital learning resources, with a significant majority of learners across surveyed areas having accessed these materials. The study established that out of the surveyed learners, the majority, 95% (n=242) had interacted with digital learning resources at school. This was highest in Kiambu 96% (n=82), followed by Nairobi 95% (n=91) and Murang'a 93% (n=82). In terms of gender, there were no significant differences in terms of access to digital learning materials between males 96% (n=114) and females 93% (n=141). Further, there was a positive correlation between the grade and interaction with digital learning resources i.e. the higher the grade the higher the proportions of learners who affirmed interacting with digital learning resources

However, while half of the teachers expressed confidence in utilizing modern technologies for effective teaching and learning, there is still room for improvement. Factors such as experience on usage of modern digital learning tools 60% (n=18), administrative support 60% (n=18), gradual implementation of modern digital learning 33% (n=10), receipt of comprehensive training 33% (n=10) and collaboration amongst colleagues, boosted their confidence. Additionally, these teachers adopt strategies such as emphasis on digital literacy 73% (n=22), visual and interactive content 53% (n=16), chunking content 33% (n=10) and gamification (27%).

Have you interacted with digital learning resources?

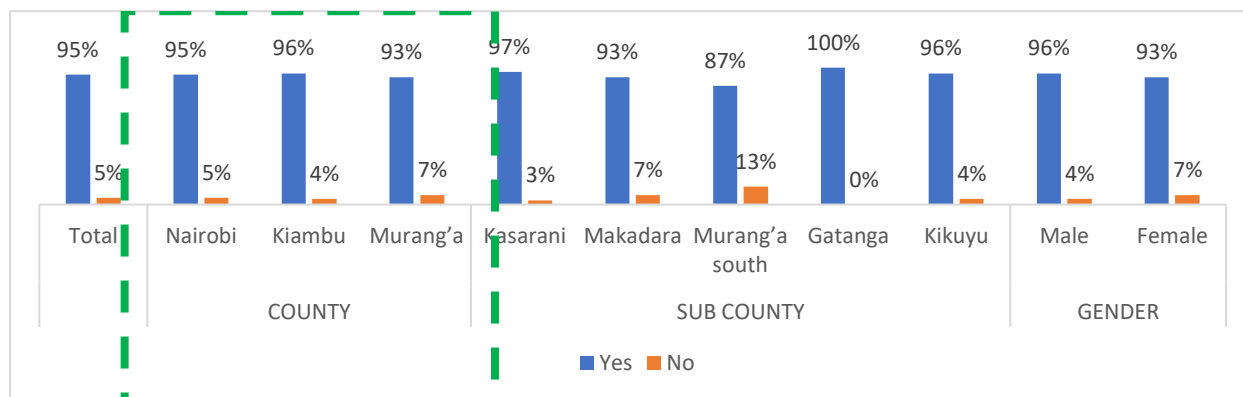


Figure 6: learners who have interacted with DLR

Availability of Digital Devices

In terms of digital devices available for learners in schools. The study established from surveyed learners that the resources available include tablets 78% (n=199), laptops 54% (n=138), and smart phones 33% (n=84). Key to note is that some of the learners mentioned that they have approved digital content educators 12% (n=31). Almost in tandem with this, findings from teacher’s observation established that teachers have access to devices such as digital teaching devices such as smartphones, tablets, laptops, CD-ROM, printers and desktop computers. Equally, findings from the qualitative phase revealed that the integration of digital devices into educational settings has become increasingly prevalent, transforming traditional learning environments into dynamic spaces where technology plays a central role. In today’s technology-driven world, digital devices such as tablets, laptops, and interactive whiteboards have become essential tools in learning institutions.

"In terms of exposure and accessibility, we have done well in Murang'a and even Kiambu, Nairobi. I'm in Njiru and I have visited schools, all schools do have a form of a computer lab. So, in terms of accessibility, Nairobi ranks first. Kiambu, then even Murang'a, they are doing well in terms of accessibility of those gadgets." ... KII MOE Nairobi

"We have the LDDs that we were given by the government-they are the only ones that we have. Learning Digital Devices-the tablets-but some of them are not working. We got around 98 but now when some of them got spoilt, repair now is another issue. "Head teacher Kikuyu

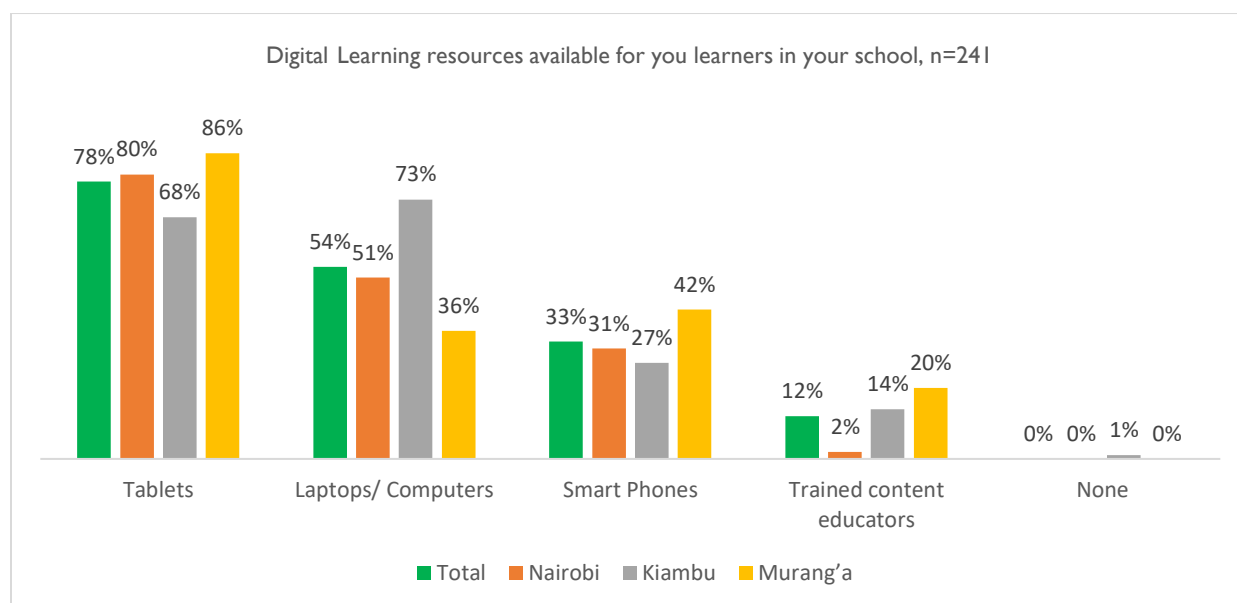


Figure 7: DLR available to learners

Electricity

Electricity is undeniably essential to power up digital devices in schools and plays a fundamental role in facilitating modern educational practices. Without electricity, these tools become inert, rendering them unusable and inhibiting the integration of technology into the learning environment. Furthermore, access to electricity enables continuous operation and charging of devices, ensuring that they remain functional throughout the school day. Beyond powering devices, electricity also supports other critical infrastructure, such as lighting and heating, which are essential for creating conducive learning environments.

Aggregating the averages from pupils, caregivers and teachers, less than half 47% (n=164) of the surveyed strongly agreed/agreed that there was reliable electricity at their schools. In terms of analysis by county,

reliability of electricity was rated highest among pupils in Nairobi 57% (n=52), followed by Murang'a 39% (n=32) and Kiambu 26% (n=21). The positive rating was mainly triggered by electricity being available 38% (n=20), lack of blackouts 13% (n=7) and having electricity that is reliable 8% (n=4). On the flip side, those who negatively rated the reliability of electricity mentioned that their rating was occasioned by incidences of blackouts, lack of electricity in some classrooms.

On the other hand, and almost in tandem with these findings, just over half 53% (n=30) of teachers positively rated (strongly agreed and agreed), that electricity was accessible in their schools. Qualitative phase findings with children and teachers indicated incidences of power outages/disruptions. Findings from the observation phase were that, in case of outages, only 17% (n=43) of classrooms had backup power options like generators, highlighting a vulnerability to power outages.

"We still have some gaps, there are so many sockets in the ICT room where we can charge the laptops. Now, the challenge comes in when you want to use them in the classrooms. Most of our classrooms are not connected to electricity." KII HT SWANI PRI SCH

Internet Connectivity

Internet access is indispensable for digital devices in primary schools and serves as a gateway to educational resources and interactive learning opportunities. The internet enables learners to access educational websites, multimedia content, and online learning platforms, enriching their learning experiences and expanding their knowledge beyond traditional textbooks. Moreover, internet connectivity facilitates collaboration among learners and teachers, allowing for real-time communication, peer interaction, and collaborative activities.

The survey established that only 26% (n=68) of the surveyed learners either strongly agreed or agreed that there was reliable internet connectivity in their schools. On the flip side, 45% (n=113) were of the contrary opinion (strongly disagreed and disagreed) whereas 16% (n=42) were indifferent. Pupils who positively rated internet connectivity at their schools mentioned there was availability of WiFi at their schools (55% (n=16), internet was reliable 10% (n=3) and signal was high 3% (n=1).

Those pupils who negatively rated internet connectivity mentioned unavailability of the WIFI 56% (143), It is not reliable 2% (1) and the Internet being limited to specific places within the school compound 2 % (n=1). Findings from observation, established a noticeable pattern: From the KIIs with School heads, the majority 6 of educational institutions only offer internet access within their administrative offices or, in some cases, limited to designated computer rooms, while 1 school (Swani Pri Sch) did not have even the internet infrastructure. This setup presents a stark reality: during class lessons, teachers often resort to hot spotting internet connectivity to their learners through personal phones. This makeshift solution highlights a concerning trend.

Findings from the teachers were also in line with the above findings with only 37% (n=11) of teachers acknowledging there was reliable internet connectivity, whereas 50% (n=15) disagreed. Some the key informants had this to say

"At the moment, we do not have [internet connectivity]. We do hope that the ChildFund will be able to make arrangements for us to have it." KII HT SWANI PRI SCH

When it comes to service providers (Poa, Safaricom), emerged as the primary choice, utilized by 43% (n=173) of those with internet access in Nairobi and Kiambu. However, a staggering 57% (n=198) of respondents remain uncertain about their internet service provider, signaling a lack of clarity or perhaps a fragmented understanding of the infrastructure supporting their connectivity. Additionally, none of the

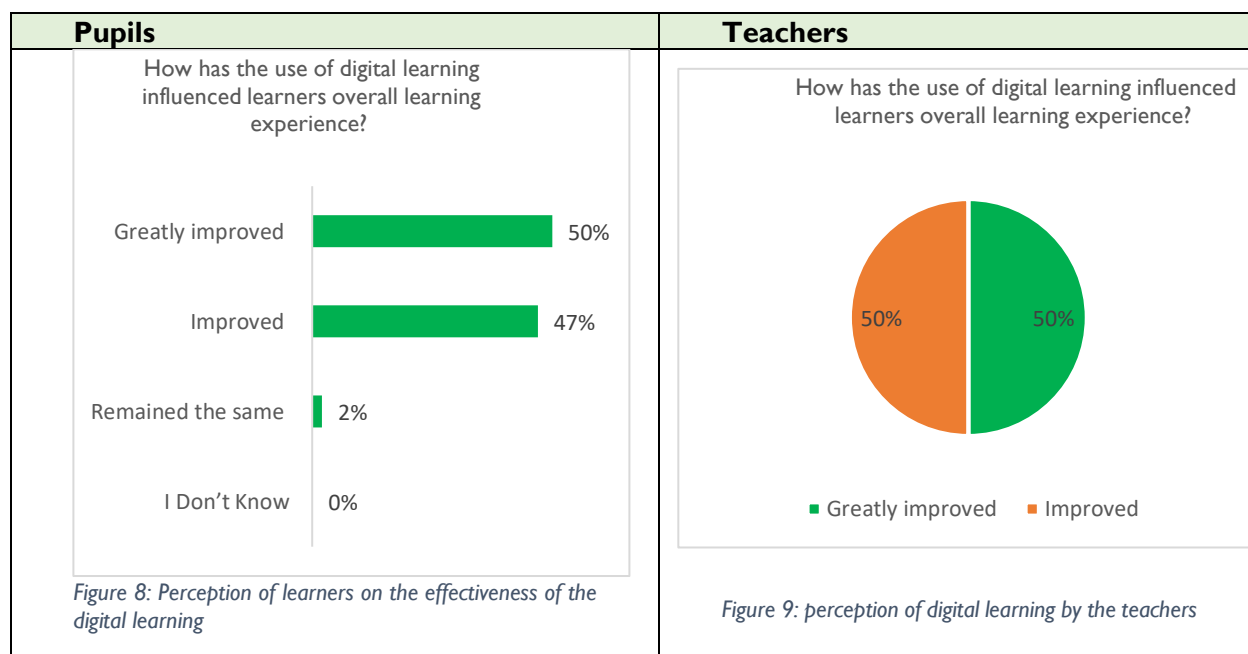
respondents reported knowledge of their available bandwidth, indicating a widespread lack of technical awareness. This gap could potentially lead to performance issues and further exacerbate the challenges of utilizing internet resources effectively for educational purposes. The current state of internet connectivity in schools underscores a pressing need for improvement. Addressing these gaps requires not only expanding access but also fostering greater technical understanding among educators and administrators. Only through concerted efforts can schools ensure that internet connectivity becomes a reliable and integral part of the learning environment, rather than a sporadic resource reliant on personal devices and makeshift solutions.

Network Connectivity

Similarly, only 36% (n=92) of the surveyed pupils indicated that there was reliable network connectivity (strongly agreed and agreed), 35% (n=89) (disagreed and strongly disagreed) whereas 15% (n=38) were neutral.

Stakeholders' perception of the effectiveness of digital learning environments

Almost all 97% (n=247) of the surveyed pupils admitted that digital learning has greatly improved 50% (n=128) and improved 47% (n=120), overall learning environments. On the other hand, all 100% (n=30) of the teachers admitted that digital learning environments had improved overall learning experience.



The main reason surveyed learners indicated that influence of digital learning had greatly improved was because they were able to learn on numerous areas of interest 95% (n=242), they were able to use smart phones 2% (n=5) and they were entertained when learning 2% (n=5). In tandem with this, findings from the qualitative phase with teachers and learners confirmed the transformative impact of digital learning. Teachers expressed how digital tools had revolutionized their teaching environment, making lessons more dynamic and captivating for learners and thereby leading to improved performance

"Digital learning has completely transformed our classrooms. It's like stepping into a new era of education. The resources available online have made lessons more engaging, and learners seem more motivated to learn." – Teacher, Muranga

"I've seen a remarkable improvement in my learners' understanding and participation since we started incorporating digital tools into our lessons. Concepts that used to be abstract are now much easier to grasp with interactive simulations and visual aids." – **Teacher, Nairobi**

On the other hand, learners expressed how digital learning has made learning more enjoyable and exciting, likening it to an adventure filled with engaging activities and interactive experiences.

"I used to find school a bit boring, but with digital learning, it's so much more fun! We get to watch videos, play educational games, and even do virtual field trips. Learning feels like an adventure now." – **FGD learner, Kiambu**

"Digital learning has made learning easier for me. I used to struggle with some subjects, but now I can watch videos and animations that help me understand better. It's like having a teacher available whenever I need one." – **Student, Nairobi**

Challenges in implementing and maintaining digital learning environments

The main challenges in implementing and maintaining digital learning environments according to teachers include limited resources 83% (n=25), poor internet 40% (12), limited access of digital learning resources 33% (n=10), lack of electricity at school 33% (n=10) and insufficient technical support 20% (n=6).

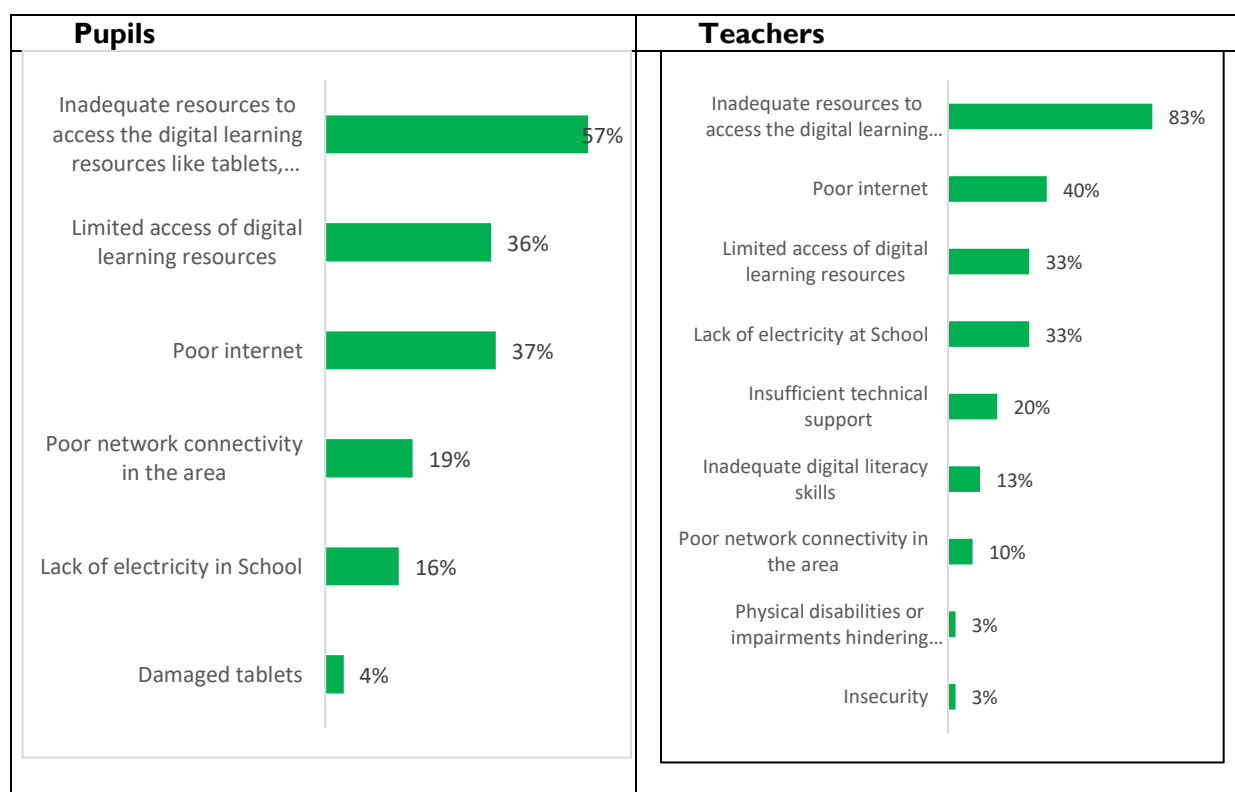


Figure 10: Barriers to digital learning

3.2.2. Outcome 2: Learners have increased access to quality digital learning education resources.

Digital-based pedagogy refers to the use of digital technologies for educational purposes such as in teaching, learning, assessment or for educational purposes (Istrate, 2022). Digital technologies in turn are electronic tools, devices and systems that transmit, process and store data in binary form such as mobile phones, laptops and computers. On September 30, 2016, the Ministry of ICT through the ICT Authority

started the roll out of the Digital Literacy Programme throughout the country. In preparation for digital learning, over 70,000 teachers had been trained by the Teachers Service Commission on the incorporation of ICT teaching and learning.

Percentage of teachers applying digital-based pedagogy in the classroom

The percentage of teachers applying digital-based pedagogy in the classroom was calculated as the percentage of teachers who used digital learning tools and resources always or often. Therefore, 44%, n=14 (62%, n=9 male and 38%, n=5 female) of all interviewed teachers used digital-based pedagogy in the classroom. The survey established that to some extent, all of the interviewed teachers for this baseline study applied digital learning tools at some point in the classroom, in their lesson plans and teaching practices. 16.7%, n=5 of the teachers surveyed always used tools and resources, another 26.7%, n=8 indicated that they often used them. On the other hand, half (50%, n=15) admitted using the tools sometimes whereas another 6.7%, n=2 rarely used them. In terms of counties, incidence rates of rare usage were more pronounced in Murang'a (10%, n=1) and Kiambu (10%, n=1), as compared to Nairobi (0%). Key to note is that the frequency in use of these tools was largely determined by the topic being taught in the classroom. The baseline survey found that the digital tool that most teachers had interacted with was the smart phone, which was mentioned by 87%, n=26 of the surveyed teachers followed by tablets (80%, n=24) and laptop devices (70%, n=21).

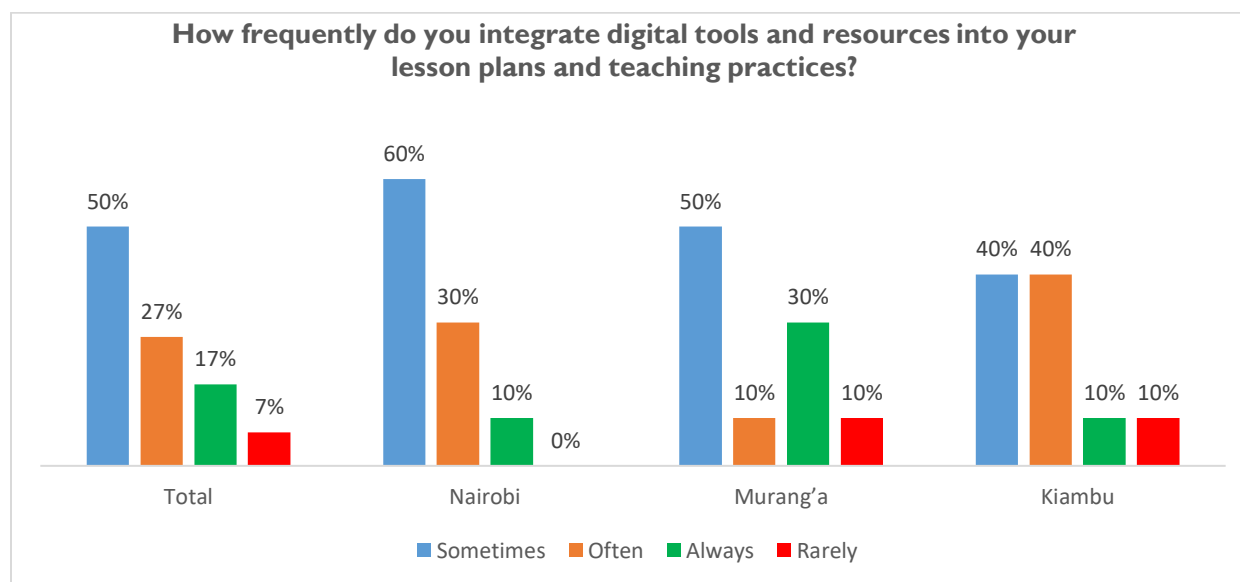


Figure 11: Frequency of digital tools integration in lesson plans; Overall

Major differences in the usage of digital devices for teaching were noted in terms of gender. The study established that the usage of the devices is more pronounced for males as compared to females. More males (62%, n=8) as compared to females (30%, n=5) indicated that they often or always used the devices. This suggests that male teachers are more likely to integrate digital devices into their teaching methodologies compared to their female counterparts. The reasons for this disparity mainly included confidence in using technology, training opportunities, and limited access to the devices

"Our school has a limited number of digital devices, and they're often booked by other teachers. It's not always easy to get access when I need them." - Teacher

"I'm not as confident with using digital devices. I worry that I might not be able to troubleshoot problems quickly if something goes wrong during a lesson." – **Female, teacher**

"I haven't received as much training on using digital devices as I would like. More professional development opportunities would definitely help." – **Female teacher**

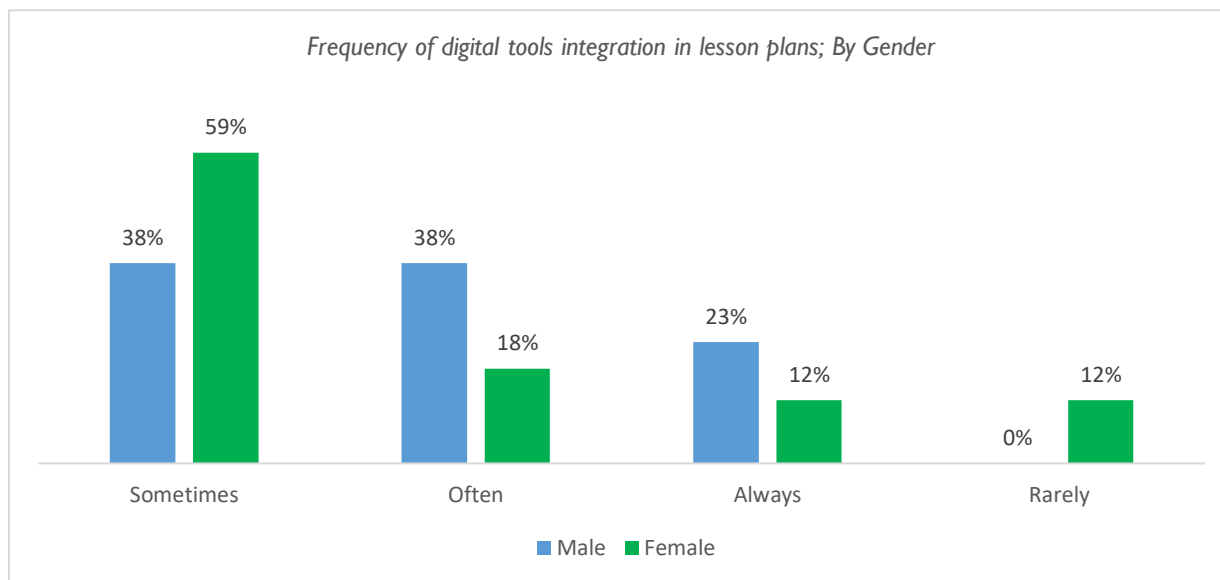


Figure 12: Frequency of digital tools integration in lesson plans; By Gender

Confidence in the usage of digital devices

When asked about their confidence in using modern technologies for teaching and learning, 50% (n=15) of the teachers were neutral, 33% (n=10) had high confidence while 17% (n=17) had very high confidence. Teachers who had high or very high confidence in the use of modern technologies for teaching and learning mainly attributed this to hands on experience in the use of digital learning tools and administrative support and encouragement for technology integration initiatives. Other notable reasons for the high confidence levels included comprehensive training on their use and the gradual implementation of digital learning.



Figure 13: A pile of faulty tablets in Kikuyu

The main challenges to implementing digital based pedagogy in the selected schools was stated as unreliable internet to support digital learning in schools as per 67% (n=20) of interviewed teachers, especially in Murang'a where 100% (n=10) of the teachers identified this as a major challenge. Inadequate digital learning resources was also a problem as per 63% (n=19) of the teachers. This was further supported during classroom observations where in 15 out of 17 observations, one tablet was shared among more than two learners. In addition, the tablets provided by the government were in need of maintenance which was not regularly done rendering some of them unfit for use in the classroom.

"There are only 60 tablets in this school and some of them are not working so the learners are forced to share in the classroom." – **Teacher Kikuyu Township** during classroom observation

“We don’t have enough tablets in this school, so teachers have to book in advance in order to teach using tablets in their classroom.” – **Head teacher, Swani Primary**

2.2. The proportion of children with increased knowledge, attitude and practices regarding digital learning, OCSEA and online child safety.

Knowledge, Attitude and practices of school children regarding digital learning

95% (n=242) (96%, n=110 male, 93% female, n=131) of all school children had interacted with digital learning resources/tools. 95% (n=86) of school children from Nairobi, 96% (n=79) of school children from Kiambu and 93% (n=76) of school children from Murang’a who were interviewed had interacted with digital learning resources. Of the children who had interacted with digital learning resources; 54%, n=129 (44%, n=57 male, 56%, n=72 female) had interacted with laptops or computers, 78%, n=188 (47%, n=88 male, 53%, n=100 female) had interacted with tablets while 33%, n=80 (35%, n=28 male, 65%, n=52 female) interacted with smart phones at school. School children from Kiambu had the highest interactions with laptops/computers at school at 73% (n=58) but had a lower interaction with tablets at 68% (n=54). In both Nairobi and Murang’a county, children had the most interactions with tablets at 80% (n=69) and 68% (65) respectively and less interactions with laptops or computers at 51% (n=44) in Nairobi and 36% (n=27) in Murang’a county. On average, more than half of the children (53%, n=136) had 0 to 1 digital lessons per week.

“My opinion, I feel like when I use the digital devices like the tablets am better, I also feel like the teachers are trying hard to make us understand and I understand better” **School Children FGD Kiambu**

“We are able to write emails, learn about social media platforms and look for answers to questions during research. We get to learn new things and do them without guidance.” **School Children FGD Murang’a**

“Some (digital learning tools) illustrate with a video which makes us understand better. Also watching the video is more enjoyable compared to just a teacher teaching.” **School Children FGD Nairobi**

The use of digital learning had improved and greatly improved the overall learning experience of 97% of the learners.

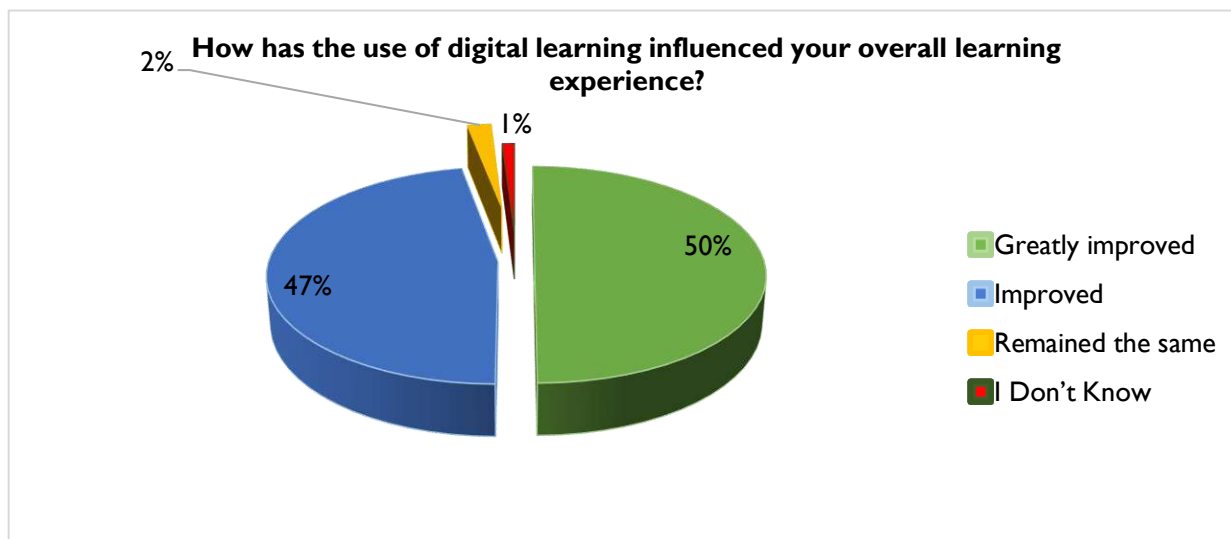


Figure 14: Influence of digital learning on overall learning experience

The improvement in the learning experience was as a result of children being able to learn on numerous areas of interest, gaining a lot of knowledge and learning had been made easier due to digital learning.

There was also support from caregivers to the children for digital learning. 93% ($n=237$) of the children claimed that their caregivers assisted them in accessing online resources or using digital tools for school. This was largely through the provision of the caregivers' phones (74%, $n=189$), provision of data bundles (28%, $n=71$) and support in acquiring the relevant online content (18%, $n=50$). Only 14%, $n=36$ (17%, $n=16$ in Nairobi, 20%, $n=16$ in Kiambu and 6%, $n=5$ in Murang'a) of the children had been bought a digital learning device by their parent. In FGDs, children claimed that their caregivers provided them with their own phones, when necessary, in order to allow them to access online materials. Caregivers also came together and contributed money to buy data bundles in schools where there was limited access to internet services.

Some of the barriers to digital learning that were identified by school children included inadequate digital learning resources (57%, $n=145$), poor internet (37%, $n=94$), limited access to digital learning resources (36%, $n=92$) and poor network connectivity (19%, $n=49$).

"There are not enough digital devices." **Children FGD, Murang'a**

"Sometimes we are divided into 8 groups and each group is given 2 tablets to share and we search together with the teacher. Sometimes before the tablets are brought, we must cost share the cost of the internet, then the teacher buys the bundles and hotspots the other tablets." **Children FGD, Nairobi**

Knowledge, Attitude and practices of school children regarding OCSEA and online child safety

According to the United Nations Office on Drugs and Crime (UNODC), Online Child Sexual Exploitation and Abuse (OCSEA) involves the use of information and communication technology as a means to sexually abuse and/or sexually exploit children.

In terms of knowledge on the term OCSEA, 34% ($n=86$), 57%, $n=37$ female and 43%, $n=49$ male of the interviewed school children had an idea on the meaning of OCSEA. This was representative of 22% ($n=20$) of all the school children from Nairobi, 33% ($n=27$) of all school children from Kiambu and 48% ($n=39$) of all school children from Murang'a. Of the 34% who had an idea on the meaning of OCSEA, 74%, $n=64$ (44%, $n=28$ male, 56%, $n=36$ female) of them understood the term to mean 'abusing of minors or children through online platforms' while 26%, $n=22$ (41%, $n=9$ male, 59%, $n=13$ female) thought it meant 'taking sexual pictures of children or the availability of nudity content to children'. On the likelihood of OCSEA happening to school children, 62%, $n=158$ (53%, $n=62$ male, 47%, $n=96$ female) of the children felt that OCSEA was unlikely and extremely unlikely to happen to them.

The baseline study also looked at the impacts of access to internet and online services. 64%, $n=162$ of the children felt that access to internet and online services had only positive impacts, 33%, $n=83$ thought it had both positive and negative impacts while 4% felt that it had only negative impacts or no impacts at all. While most children from Kiambu and Murang'a felt the internet had only positive impacts, 72%, $n=59$ and 73%, $n=60$ respectively, an equal number of children in Nairobi County were of the opinion that the internet had only positive impacts (47%, $n=43$) and both positive and negative impacts (47%, $n=43$). The positive impacts included improved digital literacy, provision of a variety of comprehension and learning alternatives, personalized information and constant access to information. Negatively, internet access was seen to bring about internet addiction, time wastage, exposure to inappropriate content and exposure to cyberbullying.

Most, 80%, $n=204$ of the school children also claimed to be familiar with the importance of online safety and responsible digital behavior. This included rules against cyberbullying, responsible social media usage, following age-appropriate restrictions and appropriate communication with peers.

On online safety, only 37% ($n=95$) of the school children had come across something that had bothered them on the internet. The majority (48%, $n=46$) had come across sexual images or content, 20%, $n=19$ had experienced cyberbullying and 18%, $n=17$ had been sent sexual images or content.

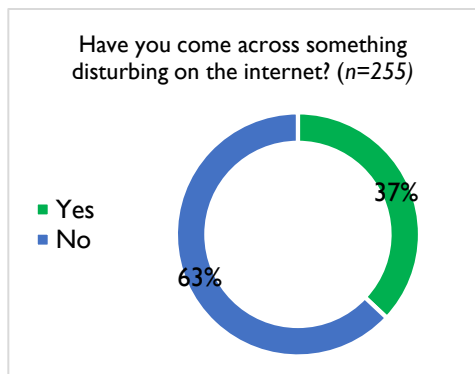


Table 7: Some of the issues learners came across while using the internet

If yes, what did you come across? (n=95)	
Sexual images or content	48%
Cyberbullying	20%
Was sent sexual images or content	18%
Pressure from friends to do things I did not want to do online	12%
Saw some horrifying content	9%

Figure 15: Affirmation to coming across disturbing information on the internet

In acknowledgement of the potential online dangers, the use of digital learning tools and online access was regulated by teachers and caregivers. In the classroom, teachers were able to monitor and regulate the usage and internet access of the children when they used tablets from a single device. The tablets were also only equipped with educational materials which limited the children’s access to any potentially harmful online content. Teachers and caregivers also constantly talked to the school children about being careful on the use of the internet including changing their passwords often, logging out of websites after using them and not clicking on unknown links.

“My parent told me that I should be logging off after using websites, I should not give passwords to anyone and should not look for inappropriate content” **Learner, Kikuyu Township**

“We can only talk openly with the children and encourage them not to use the internet inappropriately and hope that if they come across anything, they will tell us.” **Teacher, Swani Primary**

At home, caregivers monitored the use of the digital tools and had timers or passwords to limit any unwanted access. Due to the open communication, 59% ($n=151$) of all the children responded that they were likely and very likely to report any harmful content that they found on the internet to caregivers, teachers or guardian.

At school, there were the main measures to combat OCSEA and enhance online child safety was through monitoring internet usage. School children were only allowed to use the internet for specific classes. Teachers were also able to monitor tablet usage in the classroom from a single device thus limiting what the children could access. In addition, the tablets that were used by the children were only equipped with applications that were only used for school work. In the cases where inappropriate content had been noted to have been accessed by the school children, the head-teachers or BoM would call caregivers to a meeting to discuss on how to better monitor internet usage for children.

Perception of school children on the quality of digital learning education services

The overall quality of digital learning as perceived by school children was low. The schools were noted to have many challenges that hindered quality digital learning, such as inadequate digital learning tools, poor internet connectivity and inadequate electricity or power sources.

Table 8: Quality of digital learning resources

Statement	Response	
	Agree & strongly agree	Disagree & strongly disagree
There are enough digital learning resources for everyone at school	31% (n=79)	55% (n=140)
There are adequate approved digital content educators in our school	35% (n=89)	39% (n=100)
There is reliable electricity supply in our school	41% (n=105)	36% (n=92)
There is reliable internet connectivity in our school	26% (n=66)	45% (n=115)
There is reliable network connectivity in our school	36% (n=92)	35% (n=89)

Proportion of caregivers with increased knowledge, attitude and practices regarding digital learning, OCSEA and online child safety.

***please note that the sample of male caregivers was much lower than that of female caregivers (11 vs 52) hence percentages between the genders are presented as a proportion within the gender.*

Knowledge, Attitude and practices of caregivers regarding digital learning

78% (n=49) of the interviewed caregivers (91%, n=10 of all males, 75%, n=39 of all females) had seen their school going children interact with digital learning tools, especially smart phones (88%, n=43) at home. At home, 86%, n=54 (91%, n=10 of all males, 85%, n=44 of all females) of the caregivers stated that they normally support their children in accessing online resources and using digital tools for schoolwork. The support was shown mainly through the provision of phones and data bundles to access the internet. As a result of using digital learning tools, 82%, n=52 (100%, n=11 male, 79%, n=41 female) of the caregivers felt their children's learning experience had improved/greatly improved. In FGDs, caregivers supported the introduction of digital learning as they felt that it would put their children at par with the digitized world and make them equal to their peers in the rest of the world. Digital learning was also seen to be more convenient and less bulky as the children would not have to buy numerous books and could instead have a single tablet that would contain the necessary learning materials.

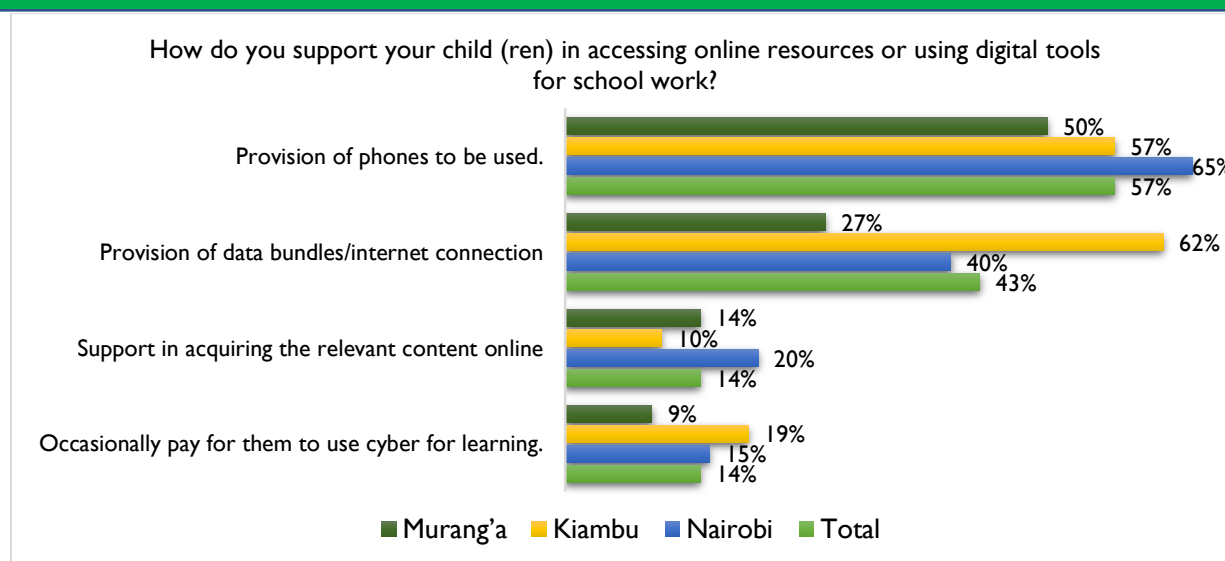


Figure 16: Support given by caregivers to children

“My child looks things up on the internet when they want to have a better understanding of what they learnt. They are even better than me at navigating the internet.” – Caregivers’ FGD Murang’a

Some of the key challenges that inhibited digital learning for children were inadequate resources for digital learning (67%, $n=42$), limited access to digital learning resources (48%, $n=30$), poor internet (41%, $n=26$) and lack of electricity (24%, $n=5$).

Knowledge, Attitude and practices of caregivers regarding OCSEA and Online Child Safety

Only 40%, $n=25$ (55%, $n=6$ male, 37%, $n=19$ female) of the caregivers who were interviewed claimed to understand the term OCSEA. Of these, 60%, $n=15$ (67%, $n=4$ male, 58%, $n=11$ female) described OCSEA as “Sexual materials online that a child can access and may have negative consequences to them”. Others thought of OCSEA as ‘the effect that comes with internet addiction’. This points out the need to educate caregivers on the various dangers that are associated with access to the internet as well as the how to prevent OCSEA.

More than half of the caregivers (57%, $n=36$) viewed access to the internet for children as having only positive impacts to their children. The positive impacts of digital learning were identified as improved digital literacy (81%, $n=48$), provided a variety of comprehension and learning alternatives for learners (36%, $n=21$), constant access to materials (31%, $n=18$) as well as promoting innovation and creativity (15%, $n=9$).

There were however concerns with the internet and online access for children. While only 37%, $n=23$ (45%, $n=5$ male, 35%, $n=18$ female) of the caregivers saw the internet as having both positive and negative effects, in FGDs, caregivers expressed the need for caution for children when accessing the internet. They felt that children could easily get exposed to adult or inappropriate materials, waste time on the internet, get exposed to cyberbullying and get addicted to phone and internet usage. They also gave some examples of incidences where their children or other children had had negative online experiences.

“My son was called, he is born again but he was being told that he is gay, he panicked and came to tell me but he also told the person who called him that it was not true but that person threatened to post it and my son told him to post it because it was false.” Caregivers FGD PK Primary

“My case was in school where my small kid goes to, and a child snuck in with a phone to school and showed them a bad image...but the kids reported to the teacher and the parent to that student was called” **Caregivers FGD St Dominic Primary School**

With the understanding that the internet could be potentially dangerous, caregivers were asked what measures they took to ensure that their children were safe when accessing the internet. In order to mitigate the dangers posed by spending time on the internet, caregivers took precautions such as limiting their children’s screen time, having open discussion with their children on the dangers of the internet, installing passwords on their smart phones as well as closely observing their children’s usage of the internet. The caregivers also emphasized that some of their children were more knowledgeable on how to operate their phones as compared to their caregivers which made it hard to manage their usage of mobile phone and overall online access.

3.2.3. Outcome 3: Improved legal and policy environments in favor of digital learning. Number of digital learning policies implemented at county level.

Overall, the study found that there are multiple policies shaping digital learning environments across Kenya and in particular in the counties under focus. These include a range of laws, regulations, and guidelines that govern the use of digital technologies in education, as outlined below

I. NATIONAL EDUCATION SECTOR STRATEGIC PLAN 2023 – 2027

The framework provides for Curriculum Reforms; to **meet modern educational needs**, such as introducing **digital literacy**, critical thinking, or life skills development. It also focusses on improving teacher training, recruitment, and retention, including efforts to enhance their professional development and working conditions. This Strategic plan policy document outlines key competencies to be achieved and these include communication, collaboration, critical thinking, imagination, creativity, citizenship, learning to learn, self-efficiency, and digital literacy⁴.

Implementation of the National Education Sector Strategic Plan (NESSP): 2023 – 2027

The County Governments implement the requisites of the NESSP policy by overseeing **pre-primary education (Early Child Education)**, youth polytechnics, home-craft centers and childcare facilities. This is also actualized through investments in infrastructure development by the County and also the support of learners and trainees in charge of ECDE.

2. POLICY ON INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION AND TRAINING 2021⁵.

This policy is anchored on the following 8 guiding principles:

- i) Inclusion and equity: Promote **inclusivity and equity in ICT** to address needs of all learners, including those with special needs, disabilities, the vulnerable and the hard to reach.
- ii) Quality and relevance: Provide education that prepares learners to competitively thrive in a **technology-oriented and information-based global economy**.
- iii) Integrity: Ensure that **ICT systems are safe and secure in education** and are utilised honestly and upholding strong moral principles.

⁴ https://education.go.ke/sites/default/files/2024-07/NATIONAL%20EDUCATION%20STRATEGIC%20PLAN%202023-2027-compressed_removed_0.pdf

⁵ <https://www.education.go.ke/sites/default/files/2023-01/ict%20in%20education%20and%20training%20policy%202021.pdf>

- iv) Transparency and accountability: Ensure that **ICT in education and training programmes** and resources are benefiting learners at all levels and that teachers, managers and trainers take responsibility for adequate service delivery.
- v) Collaboration: Promote partnerships, network and linkages among stakeholders.
- vi) Diversity: Ensure that all learners of different backgrounds, abilities and talents **access ICT services**.
- vii) Professionalism: Ensure that teachers, trainers and education managers uphold appropriate conduct, ethics, behavior and attitude.
- viii) Research and innovation: Ensure **evidence-based decision ICT in education** and training for continual improvement.

Implementation of the 2021 ICT Policy

The Ministry of Education has the overall responsibility in the implementation of this policy. However, in doing this, it will collaborate with relevant Ministries, Departments and Agencies-MDAs, County Governments, Development Partners and Key Stakeholders. As such, all the County Governments have an active role when it comes to implementation of this policy as it is requisite of the policy in financing, management and co-ordination, as well as, internal systems to strengthen the capacity at both national county levels.

At the county, ICT in education and training implementation committee comprises of membership from MoE, Teachers Service Commission -TSC, Kenya Association of Technical Training Institutions-KATTI, Teacher Training Colleges -TTCs Rep, University Rep, Kenya Secondary Schools Heads Association - KESSHA, Kenya Primary Schools Head Teachers Association-KEPSHA, Kenya Private Schools Association - KPSA, Technical and Vocational Education and Training -TVET and County Government.

The committee is chaired by the County Director of Education (CDE) with the following roles of the County ICT in education and training implementation committee includes:

- i) Co-ordinate implementation of **ICT education & training programmes** and activities at the county.
- ii) Monitor and evaluate ICT in education and training programmes and activities in the county;
- iii) Prepare and submit quarterly reports to the MoE and CG on ICT in education and training activities.
- iv) Liaise with the national steering committee and the CG to mobilise resources at the county level.
- v) Promote research and innovation programmes in ICT in education and training in the county⁶.

3. THE NATIONAL ICT POLICY, 2019

This Act recognizes the need for institutions to partner in research and innovation and universal access within an inclusive setting. **The Digital Economy Blueprint, 2019** emphasizes **digital skills** and values that promote the vision of a **digitally empowered citizenry**. This policy is aligned to the National ICT policy and creates a framework for the realization of a globally competitive digital economy.

Overall, the Digital Economy Blueprint, 2019 aligns with digital learning in Kenya by promoting the use of **digital technologies to enhance access to education, develop digital skills, foster innovation and entrepreneurship**, and drive inclusive economic growth and development. By leveraging **digital learning initiatives**, Kenya can accelerate its progress towards building a knowledge-based economy and society.

Implementation the National ICT policy, 2019

⁶ <https://www.education.go.ke/sites/default/files/2023-01/ICT%20IN%20EDUCATION%20AND%20TRAINING%20POLICY%202021.pdf>

This policy was implemented through collaboration between the national and County with the aim of ensuring that all services, both physical and **digital reach** every citizen at a guaranteed high level of quality inclusive of education services. This is being done through development of County Government Infrastructure Plan⁷.

4. NATIONAL CURRICULUM POLICY, 2018

This policy provides guidelines and principles for curriculum development and implementation across various levels of education in the country. It encourages the **integration of technology** into teaching and learning processes. This policy, similarly, enhances pedagogical approaches that support creativity, innovation, critical thinking inclusivity and sustainable development by developing, vetting and approval of **ICT-based resources** to support acquisition of required competencies. It recognizes the importance of **leveraging digital tools and resources** to enhance the quality of education and improve learning outcomes.

This policy also enhances teacher quality for effective implementation of the competency-based curriculum through established **ICT-based resources** for teachers on the competency-based curriculum approach. It also promotes transformative aspects of education in Kenya such as; **digital learning**, Competency-Based Curriculum- which focuses on developing competencies such as critical thinking, creativity, communication, collaboration, and **digital literacy**, and Teacher Professional Development that enhances pedagogical skills, content knowledge, and ICT competencies of teachers. Global Citizenship Education that promotes global citizenship education are transforming the education system in Kenya by fostering cross-cultural understanding, appreciation of diversity, and a sense of responsibility towards local and global challenges.

Implementation the National Curriculum Policy, 2018

This policy is implemented by the county through the County Education Boards, by taking charge of education matters in their respective counties. Additionally, they were also to be involved in research and propose about 10% of the content that will relate the national curriculum to the local needs and encourage to facilitate the delivery of content specific to their County⁸.

5. THE NATIONAL ICT MASTER PLAN, 2014-2017

This was developed with the vision of making Kenya an ICT hub and a globally competitive digital economy. Its overarching objectives and strategies align with efforts to enhance education through ICT integration in Kenya through the ICT Infrastructure Development, Digital Literacy and Skills Development, expanding access to education by promoting E-Learning and Digital Content, ICT-enabled Education Management Systems to streamline administrative processes, improve data management and analysis, and enhance decision-making in education. Further the plan highlights the need to collaborate with relevant policy makers and regulators to integrate ICT in education and training at all levels. Further, it indicates that one of the most effective and efficient methods of developing the ICT workforce are to integrate ICT in the curriculum for schools, colleges and universities for non-ICT subjects.

6. THE KENYA INSTITUTE OF CURRICULUM DEVELOPMENT ACT, 2013.

This Act provides for the establishment of the Kenya Institute of Curriculum Development and formally established the KICD as a statutory body responsible for curriculum development in Kenya with its functions. Among the functions of the KICD, include developing and reviewing curriculum materials,

⁷ <https://repository.ca.go.ke/server/api/core/bitstreams/1bac216a-e048-4e5d-b6e2-0de41cd726c1/content>

⁸ <https://kicd.ac.ke/wp-content/uploads/2019/05/National-curriculum-policy-revised-on-may-9-2019.pdf>

conducting research on curriculum matters, and providing curriculum support services to educational institutions. The Act similarly mandates KICD to ensure the quality and relevance of curriculum materials and to promote the use of innovative and technology-driven approaches in curriculum development⁹.

“We have the KICD Act which established the KICD, this institution comes in and oversees the learning materials and incorporates them in the syllabus and makes sure the policies are in place. We at the MoE at the county and sub county are just the enforcers of these policies.” KII MoE Murang’a County.

7. THE SCIENCE, TECHNOLOGY AND INNOVATION (ST& I) ACT, 2013:

The Act mandates the National Commission for Science, Technology and Innovation (NACOSTI) to regulate and assure quality in the science and technology sector. This policy provides for the promotion of research, innovation and entrepreneurship in order to meet the ICT needs of learners and trainees¹⁰. The Act doesn’t clearly address digital learning, it indirectly supports and aligns with digital learning initiatives in the following ways:

Research and Development in Educational Technology: The ST & I Act encourages research and development activities in various fields, including educational technology by promoting research in digital learning tools, platforms, and methodologies.

ICT Infrastructure Development: The Act emphasizes the importance of investing in information and communication technology (ICT) infrastructure. Improved ICT infrastructure, including broadband connectivity and ICT facilities in schools and educational institutions, is essential for facilitating digital learning initiatives and ensuring access to online educational resources.

Digital Skills Development: The ST& I Act aims to enhance the country's human capital by promoting skills development in science, technology, and innovation. Digital learning initiatives play a crucial role in equipping learners and educators with digital literacy and technical skills needed to effectively utilize digital tools and resources for teaching and learning.

Innovation in Education: The Act promotes innovation as a key driver of economic development and social progress. Digital learning represents an innovative approach to education delivery, leveraging technology to enhance teaching and learning processes, personalize learning experiences, and expand access to education.

3.3. LEVEL OF AWARENESS AND COMPLIANCE WITH DIGITAL LEARNING POLICIES

Despite the growing emphasis on digital literacy in the curriculum, there remains a notable gap in awareness levels among stakeholders at various levels regarding the digital learning policies. Many of the stakeholders we engaged in the study were only aware of the KICD Act, even though they weren’t fully informed of what its main mandate was.

“Digital learning policies are at a very nascent stage, so policy development is still lagging behind. The policy we are using is the KICD Act and I think it is 2013 or something I’m not sure you check. it is about educational content both digital and hard copy and that is the only one that governs us in terms of access to digital resource and distribution”. KII E-Learning Publisher

Effectiveness of the existing policies in promoting digital learning

In terms of Curriculum Integration: the KICD Act of 2013, has provided the legal framework for the development and implementation of the Competency-Based Curriculum (CBC) in Kenya. The CBC

⁹ Republic of Kenya Ministry of Education- Policy on Information and Communication Technology In Education and Training 2021

¹⁰ Ibid

emphasizes the integration of 21st-century skills, cross-cutting themes, and real-world applications across subject areas, promoting a more holistic and learner-centered approach to education.

The KICD Act underlines the importance of allocating resources and providing support for the effective implementation of integrated curricula. This includes the provision of teacher training, instructional materials, technology infrastructure, and ongoing professional development opportunities to enhance educators' capacity to integrate diverse content and pedagogical approaches into their teaching practice¹¹.

Digital learning policies facilitate the integration of technology into the curriculum across subject areas and educational levels for instance KICD has created the **Kenyan cloud** for learners to enable those who do not have money to get the free versions and materials once you log on the server. This has made a level playground suitable for every learner. Another example is that the locally assembled devices like tablets and laptops are VAT exclusive.

Cross-Cutting Issues

How does socioeconomic status impact access to and utilization of digital learning resources?

The study established a direct correlation between socioeconomic status and access to and utilization of digital learning resources. In essence, there exists a digital divide among the rural and informal settlement learners. This disparity in access to technology and digital resources makes learners from socially advantaged families tend to have better access to digital devices, reliable internet, and educational software.

“Some learners come to school hungry, some do not have access to modern digital devices at home, this makes them to not be well-informed especially on matters of digital learning”. **KII Nderi Primary Head-teacher**

“Some only see the digital devices from their friends or neighbors so they would want to access. For example, when there is homework during holidays that needs to be downloaded, you have to have money to go to the cyber to print so that they can continue learning and they do not have the money. So, you find that it becomes a challenge because when they do not have the money, they do not have access to the gadgets. Secondly this learner will not be able to learn like the rest cause of not owning gadgets”. **KII BOM St. Catherine**

According to PK (Peter Kariuki) Primary School head teacher, learners do not have access to these digital learning devices when they get back to their home, due to financial challenges that prevent their caregivers and guardians from accessing these devices. This is worse during weekends as they do not interact with these devices at all. At school they at least have a day to interact with the devices.

“Weekends are always a challenge; most caregivers do not have devices/ gadgets that can access the internet. Most learners are able to interact with digital devices away from school when they visit friends on weekends”. **KII PK School head.**

3.4. MAJOR BARRIERS TO IMPLEMENTING DIGITAL LEARNING ENVIRONMENTS AND POLICIES

What are the major barriers to implementing digital learning environments and policies?

Learners.

¹¹Kenya institute of curriculum development Standards for competence based digital course materials January

A significant proportion singled out inadequate resources to access the digital learning resources 57% (n=145) which is tied to poverty among the residents of the targeted communities. The learners equally singled out poor internet access as another barrier as 37% (n=94) that restricts learners' and teachers' ability to access online educational materials, digital textbooks, interactive learning platforms, and educational apps. This limits the diversity and richness of resources available for teaching and learning.

Limited access of digital learning resources 36% (n=92) was also mentioned as these triggers restricted content availability and without sufficient access to digital learning resources, pupils may be unable to find relevant educational materials that would advance their learning. Poor network was also cited by 19% (n=48) of the pupils as having adverse effects to digital learning. Furthermore, 16% (n=41) of the pupils mentioned lack of electricity, while 4% (n=10) mentioned damaged tablets as impediments affecting their ability to fully engage in uninterrupted digital learning. Electricity critical component of any digital learning to take place hence when not available/fluctuates digital learning is bound to be affected.

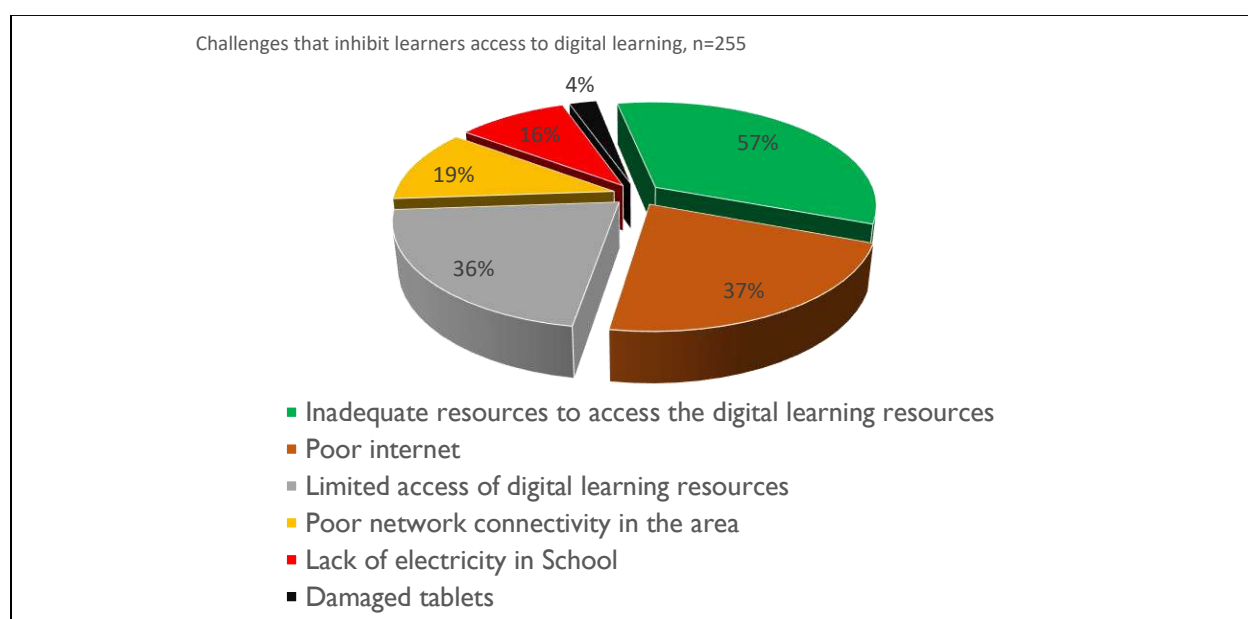


Figure 17: Challenges inhibiting access to digital learning

Caregivers

Findings from interviews with caregivers indicate that multiple, overlapping issues prevent effective digital learning. The study established that lack of resources is a significant concern among caregivers, with 67% (n=42) agreeing that it is the biggest challenge to their children accessing digital learning effectively. Other key constraints included: issues related to access to digital learning 48% (n=30) and internet access 41% (n=26). Other key barriers included lack of electricity at home (29%), poor network connectivity (24%), inadequate digital literacy skills 19% (n=12) and insufficient technical support 17% (n=11).

Despite the above challenges cited by caregivers, an impressive 86% (n=54) of caregivers mentioned that they support their children in accessing online resources for school work. This high level of parental involvement highlights a significant commitment to their children's digital learning and education as a whole, particularly in navigating the increasingly digital landscape of learning. Such support is crucial as it ensures learners can effectively utilize the vast array of digital tools and information available to them, ultimately enhancing their academic performance and technological proficiency.

“As a parent, I do not have a smartphone or TV and cannot help my child so I send them to someone else who might have a phone or TV”. **FGD Caregivers PK Primary School.**

63% (n=40) of the caregivers of those that mentioned they have smartphones, they vigilantly monitored what their children were doing with the device, this vigilant supervision is primarily aimed at ensuring that children use their phones appropriately and for the intended purposes. Such parental oversight reflects a proactive approach to managing children's digital interactions, safeguarding them from potential distractions and inappropriate content.

Table 9: How caregivers control their children when online

	Total N=63	Nairobi N=20	Kiambu N=21	Murang'a N=23
Password protecting on the computer/tablet/ smartphone.	50%	60%	83%	13%
Use of parental software to restrict access.	13%	20%	17%	0%
Constantly monitored when using the digital devices usage.	63%	60%	67%	63%
Establish Clear rules & expectations-set screen time limits)	29%	20%	33%	38%
Engage in open communication about use of internet	17%	30%	17%	0%

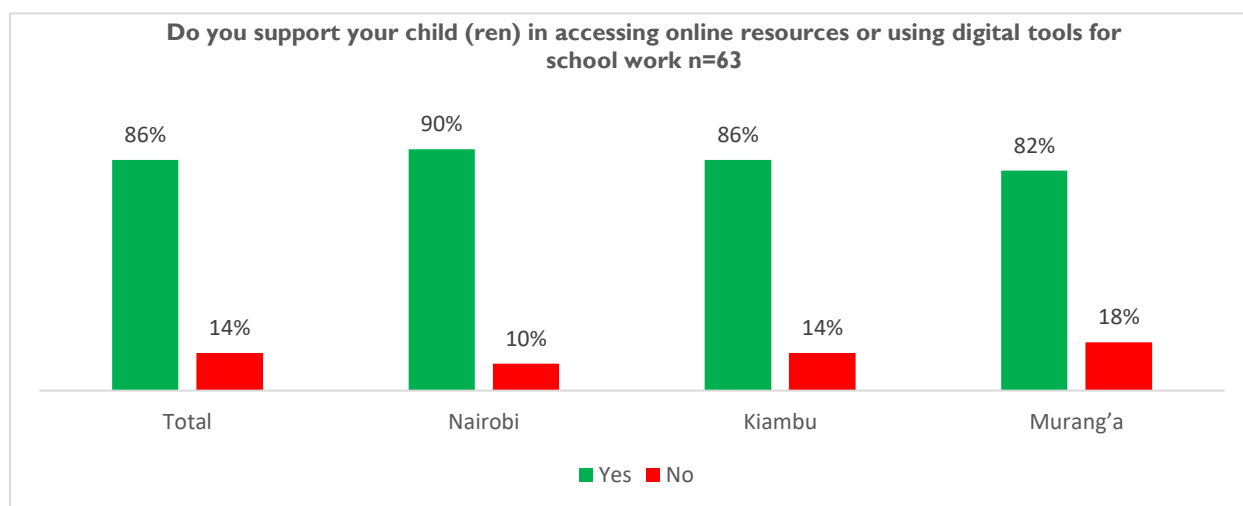


Figure 18: Support offered by caregivers to children on online activities

Inadequate resources.

This situation results in households affected by poverty having limited access to digital devices such as smartphones, computers, TVs, and radios. Inadequate connectivity and accessibility further prevent learners from poor backgrounds interacting with these digital learning devices, putting them at a disadvantage compared to learners from wealthier families who have access. Additionally, inadequate infrastructure in rural areas and informal settlements often means unreliable electricity and internet connectivity, further limiting access to digital learning. This contributes to digital literacy gaps in these areas, as learners from impoverished backgrounds lack the necessary skills to navigate online learning platforms, use digital tools, or troubleshoot technical issues, hindering their ability to effectively engage in digital learning.

“Digital tools are expensive, and most caregivers can't afford”. **KII HT St. Dominic**

“Most pupils are brought up by grandparents and they can’t afford to buy these digital tools”. FGD caregivers Nderi Primary School

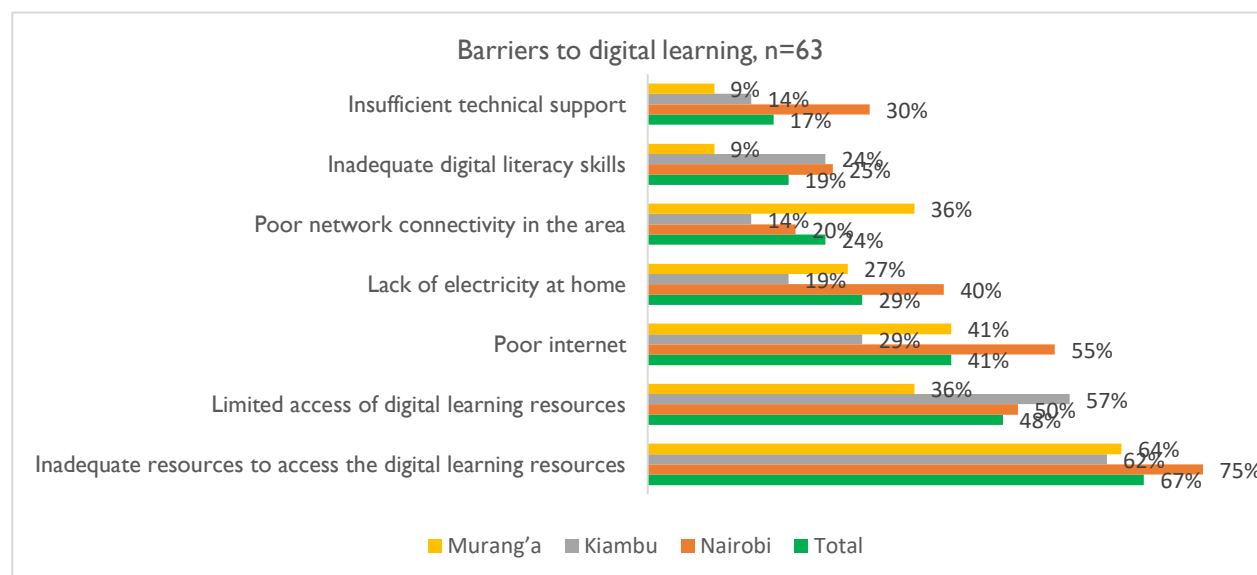


Figure 19: Barriers to Digital learning

Teachers

When teachers were asked to identify challenges inhibiting their access to digital learning, 83% (n=25) indicated that inadequate financial resources were the primary issue, highlighting the impact of poverty. Poor internet access was the second most cited challenge, mentioned by 40% (n=12) of teachers. Limited access to digital learning content and lack of electricity were both identified by 33% (n=10) of respondents. Moreover, 13% (n=4) of teachers pointed to inadequate digital literacy skills, and 10% (n=3) mentioned poor network connectivity, which is closely related to poor internet access.

The findings revealed significant barriers impeding the ability of teachers to utilize digital resources effectively. An overwhelming 83% (n=25) of teachers cited financial constraints as the primary hindrance, indicating a direct correlation between poverty and limited access to digital learning tools.

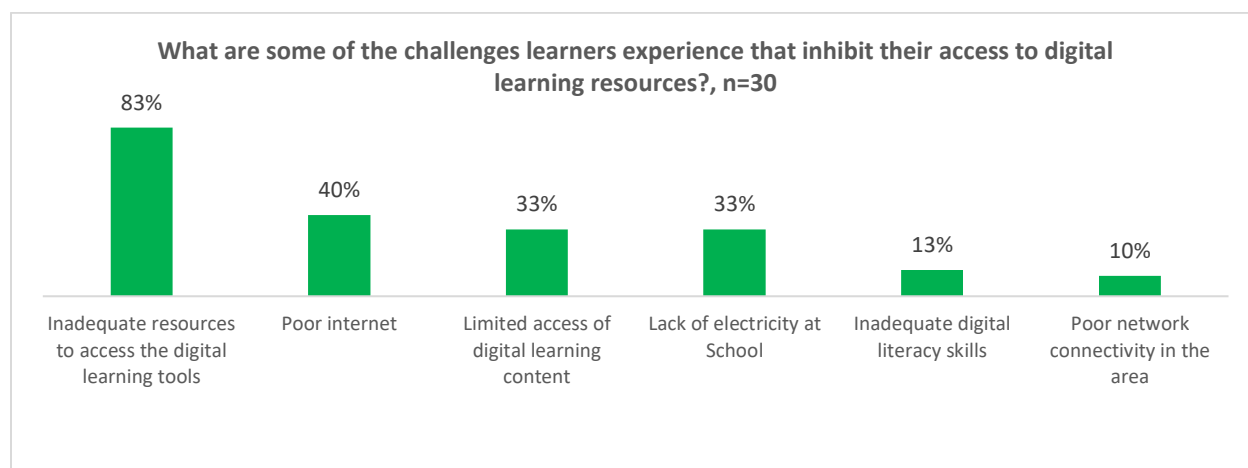


Figure 20: Challenges learners face that inhibit their access to DLR

vi) Poor internet connectivity

Internet connectivity was largely unavailable and cited by 40% (n=12) of teachers as another hindrance to digital learning. This highlights the critical need for improved infrastructure to support reliable internet access in educational settings.

“Lack of internet connection in the school is deterrent, there is no data, and the school has no WIFI” FGD pupils Primary School

vii) Lack/Fluctuation of Electricity

Lack of electricity in schools similarly was raised as a concern as well, with 33% (n=10) of teachers citing it as a significant barrier to accessing digital learning platforms. This issue necessitates attention to infrastructural development to ensure consistent power supply in educational institutions.

There is need for the ChildFund to remain flexible in terms of their budget so that if they get a situation especially in the rural schools where an area/school can be without electricity for up to 3 months, they have in place things like solar infrastructure to back up the electricity. KII E-Learning publisher

viii) Limited access to digital learning content

A considerable portion (33%) (n=10) of teachers reported limited access to digital learning content additional challenge. This underscores the importance of ensuring comprehensive and readily available educational resources for effective teaching.

A significant number of teachers had average confidence in their ability to effectively teach digital learning.

The average confidence among teachers in using digital tools and online platforms for teaching is primarily due to inadequate training and refreshers, leading to moderate confidence in integrating digital tools into their teaching practices. This is compounded by a general unfamiliarity with educational technology. Additionally, many rural teachers face limited access to technology, as schools in rural and underserved areas often lack the necessary infrastructure and devices for hands-on experience, further limiting their ability to build confidence in using technology for teaching. Consequently, only 50% (n=15) of teachers felt confident using modern technologies, with just 33% (n=10) having high confidence and a mere 17% (n=5) feeling capable of effectively teaching with modern learning technologies. This issue is particularly pronounced in Murang’a, where 70% (n=7) of teachers reported feeling only moderately confident in using modern technologies for teaching.

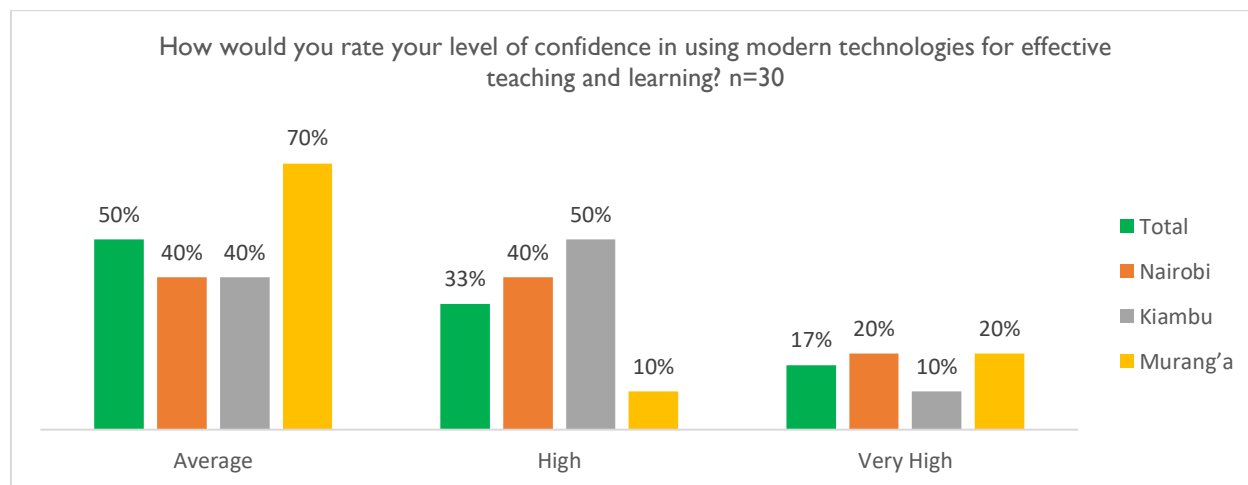


Figure 21: level of teachers confidence on using modern technologies

Inadequate digital literacy skills

Approximately 13% (n=4) of teachers cited inadequate digital literacy skills as a barrier, underscoring the necessity for targeted training programs aimed at improving educators' proficiency in utilizing digital tools for teaching purposes.

Poor Network Connectivity

Furthermore, network connectivity issues were identified as a significant obstacle to the implementation of digital learning, with 10% (n=3) of teachers reporting poor network connectivity in their respective areas. These connectivity issues exacerbate the challenges associated with inadequate internet access, further hindering teachers' ability to effectively integrate technology into their teaching practices.

3.5. HOW DO CULTURAL FACTORS INFLUENCE THE ACCEPTANCE AND ADOPTION OF DIGITAL LEARNING PRACTICES?

Culture refers to the shared beliefs, values, customs, behaviors, and artifacts that characterize a group or society. It encompasses the ways people communicate, interact, and understand the world around them.

Culture plays a significant role in influencing the acceptance or unwillingness to adoption of digital learning practices in Kenya i.e. perception of technology as attitudes towards technology that can impact the acceptance of digital learning practices.

“In Kenya, where there is a growing appreciation for technological innovation, particularly among the younger generation, the perception of technology as a tool for advancement and empowerment can drive the adoption of digital learning practices”. **KII HT Swani.**

In this baseline context, the study found that cultural factors did not exert any negative influence on the adoption of digital learning practices among community members. Throughout the research period, no instances were identified where cultural norms or values discouraged community members from embracing their children adopting digital learning initiatives. This finding suggests a favorable cultural environment conducive to the acceptance and adoption of digital learning within the community. Further investigation into the specific cultural dynamics and their implications on digital learning adoption may provide valuable insights for future initiatives and policy development. This is depicted with the below affirmation from one of the FGD. *The only thing I do not agree with is my child start embracing the bad things associated with the “West”* **FGD Nderi Pri School caregivers**

CHAPTER 4: CONCLUSION

There was notable proficiency gap among teachers in implementing digital learning highlights the critical need for enhanced professional development and training opportunities. Half the teachers 50% (n=30) reported only average confidence levels, underscoring the importance of investing in continuous learning and support mechanisms. Addressing these challenges is essential to empower educators with the skills and confidence needed to effectively integrate digital tools into their teaching practices. By prioritizing ongoing professional development, educational institutions can better equip teachers to navigate digital learning environments confidently, ultimately improving educational outcomes and preparing learners for future success in a rapidly evolving digital landscape.

Despite the government's flagship initiative, the Digital Literacy Programme (DLP), launched by then President Kenyatta in 2013, there are still existing gaps that hinder the effective use and application of digital learning technology and access. Consequently, many teachers continue to rely on traditional classroom management practices.

Prevalence of resource scarcity among a majority of caregivers interviewed 67% (n=42) highlights a critical barrier to the widespread adoption of digital learning, particularly in rural and informal sectors. This limitation significantly impacts learners' ability to engage with digital devices at home, potentially hindering their digital educational progress and access to online resources. Addressing this challenge requires collaborative efforts among stakeholders to expand access to essential resources, promote digital literacy, and create supportive environments that empower all learners to benefit equally from digital learning opportunities. By bridging these gaps, we can strive towards a more inclusive and equitable education system that prepares learners for success in a digital age.

Internet was identified as a major challenge and was highlighted by learners regarding internet connections; including slow speeds and limited coverage within schools, emphasize the critical importance of addressing infrastructure deficits. Improving these aspects of availability and improved speeds is essential to maximize the effective utilization of digital resources in learning. By enhancing internet accessibility and reliability, educational institutions can better support learners in leveraging technology for learning. This will ultimately foster a more equitable and conducive educational environment that meets the needs of today's digitally-driven world. Both learners and teachers acknowledged the positive impact of digital learning environments on overall learning experiences. Learners appreciated the ability to explore diverse topics and found learning enjoyable and exciting. Teachers noted how digital tools revolutionized their teaching practices, making lessons dynamic and captivating, leading to improved performance.

The study established widespread engagement with digital learning resources among learners, with 95% (n=242) reporting interaction. This interaction was consistent across gender and showed a positive correlation with grade level. Despite this, only half of the teachers expressed confidence in utilizing modern technologies, highlighting the need for further support and training to optimize digital learning experiences.

In summary, the prevalence of digital devices among learners and teachers in surveyed schools reflects a promising trend towards the integration of technology in education. This accessibility suggests a potential for enhancing instructional methods and educational outcomes. Nonetheless, the reported challenges related to device functionality highlight the need for ongoing support and maintenance to fully realize the benefits of digital tools in the classroom. Addressing these issues effectively will be crucial in ensuring that technology continues to serve as a valuable resource for advancing learning experiences and outcomes in educational settings. The internet is undeniably a gateway to a wealth of educational tools, resources, and

opportunities that can significantly enrich the learning experience, the persistent challenge of its unavailability/inadequacy in most of the schools, remains a critical barrier. Addressing this issue comprehensively is essential to ensure reasonable access and maximize the benefits of digital platforms for learning, thereby fostering a more inclusive and effective educational environment for all learners.

While electricity availability varied across counties, reliability was rated low overall, with only 41% (n=143) of respondents agreeing. Power outages were a concern, with limited backup options in classrooms. The government, through the Electrification of Primary Schools program led by the Rural Electrification and Renewable Energy Corporation (REREC), has been working to connect all public primary schools to the national grid, with a particular focus on supporting the Government's Digital Learning Programme in rural areas. However, challenges related to electricity persist, as mentioned by 33% (n=30) of teachers, 29% (n=18) of caregivers, and 16% (n=41) of learners, particularly in rural and informal settlement schools.

There's a disparity between pupil and teacher perceptions regarding network connectivity underscores a disconnect in their perception. A notable proportion of teachers 37% (n=11) reported reliable connectivity, while a significantly lower percentage of learners 36% (n=92) experienced the same level of consistency. Efforts to improve network infrastructure and address concerns around speed and reliability are essential steps toward creating a more conducive digital learning environment where both learners and teachers can fully leverage the benefits of digital technology for education.

Teachers identified several challenges in implementing and maintaining digital learning environments, including limited resources, poor internet connectivity, restricted access to digital resources, lack of electricity, and insufficient technical support. These challenges highlight the need for comprehensive strategies to address infrastructure limitations and provide adequate support for effective digital learning implementations.

The study also found out significant gender disparities in the utilization of digital devices for educational purposes. It unequivocally demonstrates that males exhibit a notably higher frequency of device usage compared to their female counterparts. This disparity, with 62% (n=8) of males indicating frequent use compared to only 30% (n=5) of females, underscores the need for targeted interventions to address these differences and ensure equitable access and utilization of digital tools in education.

Based on the findings of the survey, 34% (n=86) of participants demonstrated familiarity with the term OCSEA. Among those who understood its meaning, a significant majority, comprising 74% (n=64) of respondents (44% male, n=28; 56% female, n=36), correctly identified OCSEA as referring to 'abusing minors or children through online platforms'. This baseline knowledge underlines the reasonable understanding of the concept. This sets the stage for ongoing education, awareness-building, and proactive measures to safeguard children online, emphasizing the importance of continuous learning and vigilance in combating online child sexual exploitation and abuse.

The safety measures implemented within the school environment effectively mitigate online risks for pupils. Through vigilant monitoring of internet usage by teachers and restricting access to specific classes, coupled with centralized tablet management, potential exposures to inappropriate content are minimized. Moreover, the use of tablets equipped solely with school-related applications further ensures a focused learning environment. These measures collectively underscore the school's commitment to maintaining a secure online experience for learners, promoting a conducive atmosphere for educational engagement while safeguarding against potential online hazards.

In terms of digital infrastructure, Nairobi and Kiambu counties exhibited comparable capacities, each having established computer labs, although equipped with outdated computers. Both regions also

demonstrated some level of internet connectivity, even if insufficient to cover the entire school comprehensively. In contrast, Murang'a County lagged behind as it lacked equipped facilities, relying instead on less equipped "strong rooms" without any internet access in schools. This disparity underscores varying levels of technological readiness among the rural and urban centers in Kenya, highlighting a need for targeted improvements to ensure equitable access to digital resources across educational institutions.

CHAPTER 5: RECOMMENDATIONS

1. Given the moderate confidence levels among teachers in digital learning, it is imperative for the project to prioritize teacher training within professional development programs focused on digital literacy. Such initiatives will serve to bolster teachers' confidence in effectively instructing their learners. These training programs should offer practical, hands-on skills to educators.
2. In light of the frequent power outages or lack of electricity, the project should exhibit flexibility in its budgeting to establish alternative power solutions, ensuring uninterrupted digital learning. This may entail exploring options such as solar power or portable generators to mitigate the impact of power disruptions on project implementation. Similarly, Schools in Kiambu county can take advantage of County government policies like Kiambu County in promoting use of solar power.
3. The majority of schools identified poor internet access as a significant issue 37% (n=94) of learners, 40% (n=25) of caregivers, and 41% (n=12) of teachers). Therefore, it is vital for the project or government to prioritize efforts to facilitate the acquisition of reliable internet connectivity, as it is an indispensable component of digital learning.
4. Considering the prevalent issue of inadequate resources affecting the majority of caregivers in the three counties, community partnership programs should be initiated. This involves project implementers collaborating with local community organizations, NGOs, and businesses to support digital learning initiatives. Such collaborations could include donations of digital devices, funding for internet connectivity, and volunteer support for digital literacy training. Additionally, the government could provide subsidies for locally assembled digital devices, such as tablets or laptops, to learners from low-income families, ensuring equitable access to essential technology for digital learning.
5. Owing to the fact that, the low level of policy awareness among the respondents interviewed, Childfund and other education stakeholders should organize educational initiatives and outreach programs to raise awareness about existing policies through workshops, seminars, and public campaigns. There should also be stakeholder engagement, especially with key figures such as community leaders and civil society organizations, to enlist their support in promoting awareness of these policies.
6. Given the absence of government funding for device maintenance, it is recommended that Boards of Management (BOMs) and school management proactively allocate an internal budget for device repairs. This step is crucial to ensure the long-term sustainability of the project.
7. Due to insufficient technical support cited by teachers (20%) to strengthen the technical support; there is need to establish dedicated technical support channels within educational institutions to provide teachers with timely assistance for troubleshooting technology-related issues.
8. Since there still a gap in the OCSEA knowledge with only 34% (n=87) of pupils comprehending the term, there is need to enhance educational initiatives focused on online safety, particularly targeting the remaining 66% who are unfamiliar with the term. Implementing comprehensive awareness programs can further increase knowledge levels and equip both children and adults with the necessary tools to recognize and prevent online child sexual exploitation and abuse.
9. Since OCSEA concept is not light especially now that the government is advocating for digital learning in schools, implementing robust monitoring systems, and restricting access to age-appropriate content

should be encouraged. By adopting these measures, schools can further enhance student protection and create a safer digital learning environment conducive to academic success and personal well-being.

10. There is equally need to implement robust monitoring systems, and restricting access to age-appropriate content in schools.

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APPENDICES

Project M & E Matrix

Table 10: M&E Matrix

Outcome	Indicator	Definition of Indicator	Baseline	Total target	Source / Method of Gathering Data	Frequency of Gathering Data	Data Gatherer	Computation	Comments
Outcome 1: School communities have improved digital learning environments.	1.1: Proportion of schools which have established digital learning environments	Total number of schools with digital equipment, teachers and school leadership trained on ICT integration and school leadership providing curriculum support/total number of targeted schools.	82%	100%	Baseline and Endline Evaluation Survey	Beginning and End of project	External Consultant	This was a composite indicator and the indicator value was an average of: 1.) Total number of Schools with digital equipment/Number of assessed schools. 2.) Teachers trained on ICT integration/total of teachers. 3.) School Leadership Providing Curriculum Support/ Number of assessed schools.	<i>We propose an amendment to the definition of the indicator, so that digital learning environment covers adequacy and reliability of digital resources, access to electricity, internet connectivity, and access to and reliable network.</i>
Outcome 2: Learners have increased access to quality digital learning resources	2.1 Percentage of teachers applying digital-based pedagogy in the classroom	Total number of teachers trained on digital skills/Total number of teachers trained in project area.	44%	60%	Baseline and Endline Evaluation Survey	Beginning and End of project	External Consultant	Total number of teachers who positively responded to utilizing the different digital based pedagogy tools such as (interactive whiteboards, educational apps, online platforms, preparing a lesson using internet, compute, projector, TV, printers, radios, flash drive) in classrooms/total number of assessed teachers	<i>Propose an amendment of the indicator definition to Total number of teachers who positively responded to utilizing the different digital based pedagogy tools such as (interactive whiteboards, educational apps, online platforms, preparing a lesson using internet, compute, projector, TV, printers, radios, flash drive) in classrooms/total number of assessed teachers</i>
	2.2 Proportion of children with increased knowledge, attitude and practices regarding digital learning, OCSEA and	Total number of children with digital learning competencies and online safety/total number of children in targeted schools	33%	80%	Baseline and Endline Evaluation Survey	Beginning and End of project	External Consultant	This was a composite indicator and the indicator value was an average of: 1.) Total number of children with knowledge/Understanding OCSEA/Total number of learners assessed. 2.) Total number of children who identified positive recommended OCSEA activities they practice such as;	<i>The indicator is well defined, however, we propose continuous monitoring of this indicator to capture emerging practices and changing attitudes towards digital learning, OCSEA and online child safety.</i>

	online child safety.							rules against, <i>Rules against cyberbullying, Responsible social media usage, Appropriate communication with peers, Follow Age Restrictions and Guidelines (e.g. gambling Restrictions), Not sharing your password, Not engaging with strangers online, Not spending too much time online, Logging out after using media, Only watching contents that are age appropriate, Not click on websites you are unaware of)/Total number of assessed children.</i>	
	2.3 Proportion of caregivers with increased knowledge, attitude and Practices regarding digital learning, OCSEA and online child safety.	Total number of caregivers who are skilled in digital learning and online safety/total number of caregivers targeted in the project area	40%	75%	Baseline and Endline Evaluation Survey	Beginning and End of project	External Consultant	This was a composite indicator and the indicator value was an average of: 1.) Total number of caregivers with knowledge/Understanding OCSEA/Total number of caregivers assessed. 2.) Total number of caregivers who regulate their children online access at home/ Total number of caregivers	<i>The indicator is well defined, however, we propose continuous monitoring of this indicator to capture emerging practices and changing attitudes towards digital learning, OCSEA and online child safety.</i>
Outcome 3: Improved legal and policy environments in favor of digital learning	3.1: Number of digital learning policies developed	These are digital learning policies implemented at the county level by the government (since 2019)	3	2	Policy Reviews	Annual report	External Consultant	Number of digital learning policies developed and being implemented at County Level since 2019. Over this period, the policies that are being implemented include: 1. <i>National education sector strategic plan 2023 – 2027</i> 2. <i>Policy on information and communication technology in education and training 2021</i> 3. <i>The national ICT policy, 2019</i>	<i>Educational policies are developed at national level, as such this indicator as defined is unattainable. We propose an adjustment of the nomenclature of the indicator to make it SMART by adjusting it to implementation of digital learning at the county level.</i>

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