

Socio-Cultural Determinants, Parental Attitudes, and Gender Roles in Gendered ICT Access in Rural Kenyan Secondary Schools

Ogolla, Nichanor Achola¹, Ombok, Caroline Atieno²

¹Maseno University

²Alupe University

DOI: <https://doi.org/10.47772/IJRISS.2026.1026EDU0319>

Received: 20 May 2026; Accepted: 25 May 2026; Published: 12 June 2026

ABSTRACT

The integration of Information and Communication Technology (ICT) into education has transformed teaching and learning globally. However, unequal access to digital technologies continues to reinforce educational disparities, particularly among girls in rural communities. This study examined how socio-cultural determinants, parental attitudes, and traditional gender roles shape gendered access to and use of ICT in rural public mixed day secondary schools in Siaya County, Kenya. Guided by Digital Divide Theory and Gender Socialization Theory, the study employed a convergent mixed-methods design involving students, teachers, parents, school administrators, and education officers. Quantitative data were collected through questionnaires, while qualitative data were obtained through interviews, focus group discussions, observations, and document analysis.

The findings revealed significant gender disparities in access to digital devices, internet connectivity, and digital learning opportunities. Girls reported greater parental restrictions, heavier domestic workloads, and stronger social monitoring regarding technology use compared to boys. Cultural beliefs associating technology with masculinity further discouraged girls' participation in ICT-related activities and STEM subjects. School-level practices, including unequal encouragement and limited female technological role models, reinforced these disparities. The study concludes that the digital gender divide in rural Kenya is not solely a technological challenge but a socially reproduced system of inequality shaped by intersecting cultural, institutional, and household dynamics. The paper recommends gender-responsive ICT policies, community sensitization programs, equitable school-based digital initiatives, and targeted mentorship programs to promote inclusive digital participation among girls in rural schools.

Keywords: Digital divide, gender inequality, ICT integration, socio-cultural norms, rural education, Kenya.

BACKGROUND

Digital technologies have become increasingly central to contemporary education systems, reshaping how knowledge is produced, accessed, and shared. Across the world, schools are integrating ICT into teaching and learning to improve educational quality, enhance learner engagement, and prepare students for participation in digitally driven economies. According to UNESCO, digital learning environments provide significant opportunities for innovation, collaboration, and development of twenty-first century skills (UNESCO, 2023).

Despite these advancements, access to digital technologies remains unevenly distributed. Globally, gender disparities in ICT access continue to disadvantage girls and young women, especially in low-income and rural communities. Reports by UNICEF and International Telecommunication Union indicate that girls are less likely than boys to access internet-enabled devices, acquire digital skills, or participate meaningfully in technology-based learning opportunities (UNICEF, 2022; ITU, 2023).

In Sub-Saharan Africa, the digital divide continues to be exacerbated by persistent poverty, inadequate technological infrastructure, limited internet connectivity, and deeply entrenched patriarchal social structures that shape unequal access to educational opportunities. Studies across African contexts indicate that rural girls

are disproportionately disadvantaged in accessing and using digital technologies due to socio-cultural expectations that prioritize domestic responsibilities and caregiving roles over technological engagement (Muasya, 2024; Wildermuth, 2021). In many communities, parental attitudes and cultural norms regulate girls' interaction with digital devices because technology use is frequently associated with moral risk, social deviance, or inappropriate feminine behavior. As a result, girls often experience restricted screen time, limited autonomy in digital spaces, and reduced participation in ICT-related learning activities compared to boys (Njagi, 2024). These socio-cultural constraints significantly hinder girls' acquisition of digital literacy skills and technological confidence required for academic achievement, participation in STEM education, and integration into increasingly digitized labor markets across Africa (Kipkosgei, 2026).

Kenya has made notable progress in integrating Information and Communication Technology (ICT) into education through policy initiatives such as the Digital Literacy Programme (DLP), the Competency-Based Curriculum (CBC), and expanded investment in digital learning infrastructure. These initiatives were intended to enhance digital literacy, improve access to educational resources, and prepare learners for participation in a knowledge-based economy (Muathe & Otieno, 2020; Mukhongo, 2022; Kenya Institute of Curriculum Development, 2023). The Digital Literacy Programme, introduced by the Government of Kenya, specifically aimed at equipping public primary schools with digital devices and strengthening ICT integration in teaching and learning, while the CBC framework emphasized acquisition of digital literacy as a core competency for twenty-first century learning (Mukhongo, 2022). Recent studies further indicate that government investment in educational technology infrastructure has significantly expanded awareness and adoption of digital learning practices across Kenyan schools, although disparities remain between urban and rural institutions (Muasya, 2024).

Few studies in African scholarship have explicitly adopted an **intersectional analytical lens** to examine how socio-cultural norms, household dynamics, and institutional practices jointly shape gendered access to ICT in education. While recent research on the digital divide in Kenya and Sub-Saharan Africa has increasingly acknowledged gender disparities, much of it remains fragmented, focusing on either infrastructural access or individual-level digital skills without fully capturing how multiple social forces intersect to produce exclusion (Njagi, 2024; Muasya, 2024).

Studies on ICT and education in rural African contexts show that parental attitudes, school-level practices, and cultural norms often operate simultaneously to shape students' engagement with digital technologies, particularly for girls who face heightened surveillance and restricted autonomy (Wildermuth, 2021). Similarly, evidence from gender and ICT research in Kenya indicates that girls' digital participation is frequently constrained by moral concerns, domestic responsibilities, and gendered expectations reinforced within both households and schools (Njagi, 2024).

However, despite these insights, few empirical studies have systematically examined how these forces interact in specific localized settings such as rural secondary schools to produce persistent and patterned digital inequalities. Even where institutional barriers such as teacher bias and parental restrictions are acknowledged, as noted by Forum for African Women Educationalists (FAWE, 2022), there remains limited contextualized evidence showing how these dynamics converge within everyday school and household environments to shape lived experiences of ICT access among boys and girls in rural Kenya (Muasya, 2024).

Statement of the Problem

In Kenya, substantial policy efforts have been undertaken to strengthen ICT integration in education through initiatives such as the Digital Literacy Programme (DLP), the Competency-Based Curriculum (CBC), and sustained investment in digital infrastructure. These interventions have improved exposure to digital learning tools in schools and enhanced awareness of the role of ICT in teaching and learning (Kenya Institute of Curriculum Development, 2023; Mukhongo, 2022). Nevertheless, significant disparities persist between urban and rural schools, with learners in rural counties continuing to face infrastructural constraints that limit effective ICT integration and meaningful digital engagement (Muasya, 2024).

Although studies in Kenya and across Sub-Saharan Africa have documented gender disparities in ICT access, much of this literature remains fragmented, focusing largely on infrastructural deficits or individual digital skills in isolation. Few studies have adopted an intersectional perspective capable of examining how socio-cultural determinants, household dynamics, and school-level practices collectively produce sustained patterns of digital exclusion (Njagi, 2024; Muasya, 2024). Even where parental restrictions and teacher biases are acknowledged, there remains limited empirical evidence on how these factors interact within specific rural school contexts to shape everyday experiences of ICT access and use among boys and girls (FAWE, 2022).

Against this background, this study sought to address this gap by examining how socio-cultural determinants, parental attitudes, and gender roles interact to influence gendered access to and use of ICT in rural public mixed day secondary schools in Kenya. It specifically aimed to generate localized, gender-disaggregated evidence that reflects the lived realities of learners in rural educational settings, where digital inequality is most pronounced yet least empirically documented.

Purpose of the Study

The purpose of this study is to examine how socio-cultural determinants, parental attitudes, and gender roles interact to shape gendered access to and use of Information and Communication Technology (ICT) among students in rural public mixed day secondary schools in Kenya. The study seeks to generate localized, gender-disaggregated evidence to explain persistent digital inequalities in rural school contexts.

Objectives of the Study

General Objective

To investigate the influence of socio-cultural determinants, parental attitudes, and gender roles on gendered access to and use of ICT in rural public mixed day secondary schools in Kenya.

Specific Objectives

1. To examine how socio-cultural norms influence students' access to and use of ICT in rural secondary schools.
2. To determine the influence of parental attitudes on students' access to and use of digital technologies.
3. To assess how traditional gender roles shape boys' and girls' participation in ICT-related learning activities.
4. To explore the extent to which school-level practices contribute to gender disparities in ICT access and use.

Research Questions

1. How do socio-cultural norms influence students' access to and use of ICT in rural secondary schools?
2. In what ways do parental attitudes affect students' access to and use of digital technologies?
3. How do traditional gender roles influence boys' and girls' participation in ICT-related learning activities?
4. How do school-level practices contribute to gendered disparities in ICT access and use among students in rural secondary schools?

CONCEPTUAL FRAMEWORK

This study is anchored on the understanding that gendered access to and use of ICT in rural secondary schools is not determined by infrastructure alone, but by the interaction of social structures, cultural norms, household dynamics, and institutional practices. The conceptual framework is therefore built on three interrelated theoretical perspectives: The **Digital Divide Theory**, **Gender Socialization Theory**, and **Social Role Theory**.

The Digital Divide Theory conceptualizes inequality in access to, use of, and outcomes from digital technologies across different social groups. It moves beyond physical access to include skills, usage quality, and the benefits derived from ICT engagement (van Dijk, 2020; Ragnedda & Muschert, 2021). Contemporary scholarship emphasizes that digital inequality is multidimensional, involving first-level (access), second-level (skills and usage), and third-level (outcomes) divides. In relation to this study, the theory provides a useful lens for understanding the observed disparities in ICT access and use among learners. It explains variations in the availability of ICT devices across both school and home environments, where some students—particularly boys—are more likely to have consistent access than girls. It also accounts for differences in how frequently and effectively boys and girls engage with digital technologies, with boys generally experiencing more autonomous and regular use compared to girls, whose access is often restricted or supervised. Furthermore, the theory helps to interpret the resulting inequalities in educational outcomes and digital skills development, as unequal exposure and engagement with ICT ultimately translate into differing levels of digital competence and learning achievement between male and female students.

Gender Socialization Theory argues that gendered behaviors, roles, and expectations are learned and reinforced through social institutions such as the family, school, religion, and peer groups (Bussey & Bandura, 2020; Ridgeway, 2021). Children internalize norms about what is considered appropriate behavior for boys and girls through continuous interaction with their environment.

In the context of this study, the theory helps to explain how gendered patterns of ICT access and use are socially produced and reinforced within both household and school environments. It accounts for parental control over girls' engagement with digital technologies, often justified by concerns about morality, safety, and appropriate behavior. It also illuminates how the allocation of domestic responsibilities to girls reduces the time and opportunity available for meaningful interaction with ICT, thereby limiting their digital exposure and skill development. In addition, the theory clarifies how gendered expectations are reproduced within school settings, where boys are more frequently encouraged to engage with ICT-related activities while girls are subtly steered toward less technology-intensive roles, further entrenching disparities in digital participation.

Social Role Theory posits that gender differences arise from the distribution of men and women into social roles, which shape skills, expectations, and behavior over time (Eagly & Wood, 2020). Societies tend to associate men with public, technical, and leadership roles, while women are linked to domestic and caregiving responsibilities.

In this study, the theory explains how gendered expectations within society and institutions shape unequal engagement with ICT. It highlights how boys are more frequently encouraged to participate in ICT-related activities and pursue STEM subjects, reinforcing their confidence and exposure to digital technologies. In contrast, girls are often socialized into domestic roles that limit the time and opportunity available for meaningful digital engagement. The theory further accounts for institutional biases within schools, where access to limited ICT resources and opportunities may be subtly allocated in ways that favor boys, thereby reinforcing existing gender disparities in digital learning experiences and outcomes.

The conceptual framework for this study posits a structured relationship between independent, intervening, and dependent variables in explaining gendered disparities in ICT access and use among learners in rural secondary schools. The independent variables comprise socio-cultural norms, which shape beliefs about gender, morality, and appropriate technology use; parental attitudes, which influence the extent of support, restriction, and monitoring of students' ICT engagement; and gender roles, which define domestic responsibilities and expected behavioral patterns for boys and girls.

These influences are mediated by intervening variables within the school environment, including ICT-related policies and institutional practices that govern access and usage, the availability of ICT infrastructure such as computers, internet connectivity, and electricity, as well as teacher attitudes and classroom practices that shape how ICT is integrated into learning. Peer influence and the prevailing digital culture within schools further mediate how students interact with technology and perceive its relevance.

The combined effect of these independent and mediating factors determines the dependent variable, which is gendered access to and use of ICT. This is reflected in differences in frequency and autonomy of ICT use, the

type and depth of digital engagement, levels of digital literacy, and participation in ICT-related learning activities, ultimately shaping unequal educational experiences between boys and girls.

In this study, socio-cultural norms, parental attitudes, and gender roles interact to shape how students access and use ICT in rural secondary schools. These forces operate within broader structural conditions such as limited infrastructure and institutional school practices. Together, they influence whether learners can access digital devices, how frequently they use them, and the extent to which they develop digital literacy competencies.

Girls are particularly affected due to gendered socialization processes that assign them greater domestic responsibilities and stricter behavioral expectations. These constraints reduce their time, autonomy, and confidence in engaging with ICT. Boys, on the other hand, benefit from more permissive social expectations that encourage exploration of digital technologies.

School environments further mediate these dynamics through teacher attitudes, ICT allocation practices, and institutional norms that may unintentionally favor boys in access to limited digital resources. As a result, gendered ICT inequality emerges as a cumulative outcome of interacting social, cultural, and institutional forces.

Siaya County–Aligned Conceptual Framework

Figure 1: Conceptual framework showing how socio-cultural norms, parental attitudes, and gender roles interact with school-level factors to shape gendered ICT access and outcomes in rural secondary schools in Siaya County, Kenya.

SOCIO-CULTURAL & HOUSEHOLD FACTORS

- Domestic chores (girls' time poverty)
- Parental monitoring and restriction of ICT use
- Cultural beliefs linking ICT use to morality risk
- Gender expectations (boys = technology, girls = home roles)



SCHOOL-LEVEL MEDIATING FACTORS

- Limited ICT infrastructure (few computers, weak internet)
- Teacher bias in ICT task allocation (boys prioritized)
- Male dominance in ICT demonstrations and leadership
- School ICT club participation skewed toward boys



EXPERIENCED GENDERED ICT ACCESS

GIRLS:

- Restricted screen time
- Low autonomy in ICT use
- Limited ICT club participation
- Reduced confidence in ICT tasks

BOYS:

- Greater autonomy and freedom
- Higher exposure to ICT tools
- More participation in ICT/STEM activities



EDUCATIONAL OUTCOMES

- Lower ICT competence among girls
 - Reduced participation in STEM subjects
 - Gender gap in digital literacy skills
 - Unequal preparedness for digital economy
-

LITERATURE REVIEW

Introduction

This section reviews literature related to socio-cultural determinants, parental attitudes, gender roles, and school-level practices in shaping gendered access to Information and Communication Technology (ICT) in education. The review is organized thematically according to the study objectives and draws evidence from global, African, and Kenyan contexts. The discussion is grounded in contemporary scholarship emphasizing that digital inequality is not only a matter of infrastructure but also of social, cultural, and institutional dynamics (UNESCO, 2023; ITU, 2023).

Socio-Cultural Norms and Students' Access to ICT

Globally, socio-cultural norms significantly influence how learners access and use ICT, particularly in low-income and rural contexts. Studies indicate that gendered perceptions of technology often position ICT as a masculine domain, thereby limiting girls' participation in digital learning activities (OECD, 2021; UNESCO, 2023). In many societies, cultural expectations shape attitudes toward appropriate behavior for boys and girls, affecting confidence and willingness to engage with digital tools.

In Sub-Saharan Africa, socio-cultural norms remain a major driver of digital inequality. Research shows that girls are often discouraged from using digital devices due to fears of moral risk, exposure to inappropriate content, and concerns about online interactions (Wildermuth, 2021; GSMA, 2022). In Ghana and Nigeria, studies reveal that community perceptions of ICT as a space requiring supervision disproportionately restrict girls' digital participation compared to boys (Afolabi & Olumide, 2022).

In Kenya, similar patterns are observed. Studies by Muasya (2024) and Njagi (2024) show that cultural beliefs associating technology with masculinity and moral vulnerability significantly shape ICT engagement among students. In rural settings, girls' access to ICT is often regulated by expectations of obedience, modesty, and domestic responsibility, limiting their autonomy in digital spaces. These socio-cultural constraints are particularly pronounced in rural counties such as Siaya, where traditional norms remain strongly embedded in daily life.

Parental Attitudes and Students' ICT Access and Use

Parental attitudes play a critical role in shaping children's access to digital technologies across global contexts. Research from developed countries shows that parental mediation strategies, such as restrictive, active, or co-use approaches, significantly influence children's digital engagement and skill development (Livingstone & Blum-Ross, 2020). While active mediation promotes digital literacy, restrictive approaches often limit exploration and skill acquisition.

In Africa, parental attitudes toward ICT are often shaped by concerns about morality, safety, and academic discipline. Studies across Sub-Saharan Africa show that parents are more likely to restrict girls' access to digital devices than boys due to fears of online harassment, distraction, and exposure to inappropriate content (GSMA, 2022; UNICEF, 2022). This results in unequal opportunities for digital learning within households.

In Kenya, research indicates that parental control significantly influences ICT access among learners. FAWE Kenya (2022) reports that many parents restrict girls' use of mobile phones and computers, especially outside

school hours, due to concerns about moral behavior and academic performance. Similarly, Njagi (2024) observes that girls experience stricter supervision compared to boys, limiting their opportunities to develop independent digital skills. These parental restrictions contribute to widening gender gaps in ICT competence and confidence among students in rural secondary schools.

Gender Roles and Participation in ICT-Related Learning Activities

Globally, traditional gender roles continue to influence educational participation and career pathways in STEM and ICT-related fields. The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2023) reports that girls remain underrepresented in STEM disciplines due to persistent stereotypes that associate science and technology with masculinity.

In Sub-Saharan Africa, gender roles are strongly linked to domestic responsibilities that disproportionately affect girls. Studies show that girls spend significantly more time on unpaid household labor than boys, reducing their time for study and engagement with digital technologies (UNICEF, 2022; Kipkosgei, 2026). This “time poverty” limits their participation in ICT learning activities and reduces their exposure to digital tools.

In Kenya, gender roles are deeply embedded in household and school structures. Research by Wildermuth (2021) and Muasya (2024) shows that girls are more likely to be assigned domestic chores such as cooking, cleaning, and caregiving, which reduce their ICT engagement time. Boys, on the other hand, are more frequently encouraged to explore technology and participate in ICT clubs and STEM-related activities. These disparities reinforce long-term differences in digital literacy and career aspirations.

School-Level Practices and Gender Disparities in ICT Access

School environments play a significant mediating role in shaping ICT access and use. Globally, unequal distribution of ICT resources within schools has been shown to influence learning outcomes, particularly where infrastructure is limited (World Bank, 2021). Teacher attitudes and institutional priorities often determine how ICT resources are allocated among students.

In Africa, limited ICT infrastructure in schools often results in competition for resources, which can reinforce gender inequalities. Studies in Tanzania, Ghana, and Uganda show that boys are more likely to be prioritized in ICT usage when resources are scarce due to assumptions about technical ability and interest (GSMA, 2022).

In Kenya, school-level practices significantly shape ICT access and participation. FAWE Kenya (2022) notes that in some schools, boys are more frequently selected for ICT tasks, competitions, and leadership roles in ICT clubs. Muasya (2024) further observes that teacher biases and limited infrastructure often lead to informal prioritization of boys in ICT engagement. Additionally, schools in rural areas such as Siaya face infrastructural challenges including limited computers, unreliable electricity, and inadequate internet connectivity, which exacerbate gender disparities in access and usage.

Summary of Literature Review and Research Gap

The reviewed literature demonstrates that gendered ICT access is influenced by a combination of socio-cultural norms, parental attitudes, gender roles, and school-level practices. While global and African studies provide valuable insights, much of the existing research remains generalized and fragmented, often focusing on either infrastructure or individual-level digital skills.

In the Kenyan context, although studies acknowledge gender disparities in ICT access, there is limited localized empirical research that integrates socio-cultural, household, and institutional factors within rural secondary school settings. Few studies adopt an intersectional approach that examines how these variables interact to produce persistent digital inequalities, particularly in counties such as Siaya where rurality and traditional norms remain strongly influential. This study therefore addresses this gap by providing a context-specific, gender-disaggregated analysis of how socio-cultural determinants, parental attitudes, gender roles, and school-level practices collectively shape ICT access and use in rural Kenyan secondary schools.

RESEARCH METHODOLOGY

Research Design

This study adopted a mixed methods research design to examine gender disparities in access to and use of Information and Communication Technology (ICT) in rural mixed day secondary schools. The design integrated both quantitative and qualitative approaches to provide a comprehensive and contextualized understanding of the phenomenon.

A convergent parallel mixed methods design was specifically employed, whereby quantitative and qualitative data were collected concurrently, analyzed independently, and subsequently merged during interpretation. This approach enabled triangulation of findings, enhancing validity and providing both statistical measurement and contextual explanation of gendered ICT inequalities.

The quantitative strand facilitated measurement of gender differences in ICT access, usage patterns, and educational outcomes, while the qualitative strand generated in-depth insights into socio-cultural, institutional, and household dynamics influencing ICT engagement.

Research Paradigm

The study was guided by a pragmatic research paradigm, which supports methodological pluralism and prioritizes practical understanding of real-world problems. Pragmatism was appropriate because the study required both numerical measurement of ICT disparities and qualitative exploration of lived experiences among students, teachers, parents, and school administrators. This dual approach allowed the researcher to focus on “what works” in explaining gendered digital inequality in rural educational contexts.

Study Area

The study was conducted in public mixed day secondary schools in Siaya County, Kenya, a predominantly rural region where conditions provide a critical context for examining gendered digital inequality in education. The county is characterized by generally limited ICT infrastructure within schools, with many institutions lacking sufficient computers and adequately equipped digital learning facilities. In addition, some areas experience inconsistent electricity supply, which further constrains the effective use of ICT in teaching and learning processes.

Internet connectivity across the county remains weak and unreliable, particularly in rural and remote locations, making sustained engagement with digital learning tools difficult for both learners and teachers. These infrastructural challenges are compounded by strong socio-cultural norms that continue to shape gender roles within households and communities, often influencing how boys and girls access and use technology differently. Furthermore, the implementation of national ICT integration policies is uneven across schools, resulting in significant variation in the availability and utilization of digital learning resources.

Taken together, these structural and socio-cultural conditions make Siaya County an appropriate and informative setting for investigating how intersecting factors influence gendered access to and use of ICT in secondary education.

Target Population

The target population comprised key stakeholders involved in secondary education and ICT integration:

1. Boys and girls in Form Two and Form Three (aged 15–18 years), selected due to their active engagement with ICT-integrated learning under the Competency-Based Curriculum.
2. ICT teachers, Mathematics teachers, and Science teachers involved in ICT-supported instruction.
3. Principals, deputy principals, and ICT coordinators responsible for ICT policy implementation.
4. Individuals responsible for students' household environments and digital access. (Parents and guardians)

5. School governance actors responsible for resource allocation and policy oversight.(Boards of management members)

Sampling Procedures and Sample Size

Sampling Techniques

multi-stage sampling strategy was employed:

Selection of Schools

Ten public mixed day secondary schools were selected using purposive sampling based on:

1. Availability of ICT infrastructure (even if limited)
2. Rural classification
3. Enrollment of both boys and girls
4. Willingness to participate in the study

Selection of Students

Students were selected using stratified random sampling, where gender (boys and girls) formed the primary strata. This ensured equal representation and enabled direct comparison of gendered ICT experiences.

Selection of Teachers and Administrators

Teachers and administrators were selected using purposive sampling, focusing on individuals directly involved in ICT implementation and academic instruction.

Selection of Parents and BoM Members

Participants were selected using purposive and snowball sampling, guided by accessibility and relevance to students' school participation and ICT exposure.

Sample Size

The study sample included:

1. 10 secondary schools
2. 250 students (balanced representation of boys and girls)
3. 20 teachers
4. 10 school administrators
5. 15 parents/guardians
6. 10 Board of Management members

Sample Size Determination

Student sample size was determined using Yamane's (1967) formula:

$$n = \frac{N}{1 + N(e^2)}$$

Where:

- n = sample size

- N = population size
- e = margin of error (0.05)

This ensured statistical adequacy and representativeness of the student sample.

Data Collection Methods

To ensure methodological triangulation, multiple data collection methods were used:

Student Questionnaires

Structured questionnaires were administered to 250 students to collect quantitative data on:

1. ICT device ownership and access
2. Internet availability at home and school
3. Frequency and purpose of ICT use
4. Digital literacy and confidence levels
5. Participation in STEM-related activities
6. Academic performance indicators

Key Informant Interviews (KIIs)

KIIs were conducted with principals, ICT coordinators, and education officers to obtain institutional perspectives on:

1. ICT integration policies and implementation
2. Resource allocation practices
3. Gender disparities in ICT access
4. Institutional constraints in ICT deployment

Semi-Structured Student Interviews

Individual interviews were conducted with selected students to explore:

1. Personal experiences with ICT use
2. Gender-based restrictions at home and school
3. Digital autonomy and confidence
4. Patterns of supervised versus independent ICT use

Focus Group Discussions (FGDs)

Separate FGDs were held with boys, girls, teachers, parents, and BoM members to explore:

1. Socio-cultural norms influencing ICT use
2. Gendered expectations and household responsibilities

3. Barriers to ICT access and participation
4. School-home interactions shaping digital engagement

Non-Participant Observations

Observations were conducted in ICT laboratories and classrooms to document:

1. Real-time ICT usage patterns
2. Gender participation during ICT lessons
3. Allocation of ICT tasks among learners
4. Teacher-student interaction during ICT activities

Document Analysis

Relevant documents were reviewed, including:

1. School ICT policies
2. Lesson plans and schemes of work
3. STEM academic performance records
4. Ministry of Education ICT integration guidelines

Data Analysis Procedures

Quantitative Data Analysis

Quantitative data were analyzed using statistical software, specifically SPSS and STATA, to generate both descriptive and inferential outputs. Descriptive statistics, including frequencies, percentages, and means, were used to summarize patterns of ICT access, usage, and related variables across the study population. These measures provided an overall picture of the distribution and intensity of ICT engagement among students.

Inferential statistical techniques were then applied to examine relationships and differences within the data. Chi-square tests were used to determine the association between gender and ICT access, while independent samples t-tests assessed gender-based differences in ICT usage patterns. In addition, regression analysis was conducted to evaluate the effect of ICT access on students' performance in STEM subjects.

The results of the quantitative analysis were presented using tables, charts, and graphs to enhance clarity, facilitate comparison, and support interpretation of key findings.

Qualitative Data Analysis

Qualitative data were analyzed using thematic analysis as outlined by Braun and Clarke (2006), providing a systematic approach to identifying, organizing, and interpreting patterns within the data. The analysis began with transcription of all interviews and focus group discussions, followed by repeated reading of the transcripts to ensure familiarization with the data.

This was followed by a coding process in which meaningful segments of text were identified and assigned descriptive labels. Related codes were then grouped into broader categories, which were subsequently refined into coherent themes that reflected recurring patterns across participants' experiences and perceptions.

The analysis generated key themes including gender norms and ICT access, parental control and digital restriction, school-based ICT practices, and digital confidence and autonomy. These themes captured the multi-layered social, institutional, and cultural factors shaping ICT engagement among boys and girls in the study context. To strengthen interpretive depth, the analysis incorporated descriptive frequency indicators such as “majority,” “several participants,” and “a few respondents” to reflect the relative prevalence of particular views. However, these were used purely as interpretive aids to enhance narrative clarity and were not intended for statistical generalization.

Validity, Reliability, and Trustworthiness

Validity

Content validity of the research instruments was established through a systematic review process involving subject matter experts, who evaluated the relevance, clarity, and adequacy of the items in relation to the study objectives. Their feedback was used to refine and improve the instruments to ensure alignment with the constructs being measured. In addition, the tools were pilot-tested in a comparable secondary school outside the study area. The pilot study helped identify ambiguous or misleading items, which were subsequently revised to enhance clarity, accuracy, and appropriateness for the target respondents.

Reliability

The reliability of the quantitative instruments was assessed using Cronbach’s Alpha coefficient to determine internal consistency. A threshold value of 0.70 or above was adopted as the acceptable benchmark, consistent with established standards in social science research. Items that did not meet the required reliability level were reviewed and adjusted to improve consistency and ensure that the instruments reliably measured the intended constructs.

Trustworthiness

The trustworthiness of the qualitative component was ensured through several strategies designed to enhance credibility, dependability, confirmability, and transferability. Methodological triangulation was employed by integrating multiple data sources, including interviews, focus group discussions, observations, and document analysis. Member checking was conducted to validate interpretations by allowing participants to confirm the accuracy of their responses. An audit trail was maintained to document all stages of data collection, coding, and analysis, thereby ensuring transparency and accountability. In addition, prolonged engagement in the field allowed the researcher to build rapport with participants and gain a deeper contextual understanding of the study environment.

Data Integration

Data integration was undertaken at the interpretation stage through systematic triangulation of quantitative and qualitative findings. In this process, statistical results on gender disparities in ICT access and usage were interpreted in conjunction with qualitative evidence that illuminated the underlying socio-cultural, familial, and institutional factors shaping these patterns. The integration involved examining areas of convergence, where both datasets reinforced similar conclusions; complementarity, where qualitative findings provided explanatory depth to quantitative trends; and divergence, where differences between datasets prompted further interpretive reflection. Through this iterative comparison, the study developed a more comprehensive and nuanced understanding of gendered ICT inequality in rural secondary school contexts, capturing not only the magnitude of disparities but also the social processes that sustain them.

Ethical Considerations

Ethical clearance for the study was first obtained from the university research ethics committee to ensure compliance with established academic and research standards. This was followed by formal authorization from the Ministry of Education and the relevant County education authorities prior to the commencement of data collection in the selected schools.

Throughout the study, strict adherence to key ethical principles was maintained. Informed consent was obtained from all adult participants, while assent was secured from student respondents in line with ethical guidelines for research involving minors. Participation in the study was entirely voluntary, and respondents were clearly informed of their right to decline participation or withdraw at any stage without any form of penalty or adverse consequence.

Confidentiality and anonymity were rigorously upheld by removing personal identifiers from all data records and ensuring that findings were reported in a way that did not reveal the identity of any participant or institution. In addition, all collected data were securely stored with restricted access to protect participant privacy and maintain data integrity.

STUDY FINDINGS, PRESENTATION, INTERPRETATION AND DISCUSSION

Introduction

This chapter presents findings on gender disparities in access to and use of digital learning resources in rural mixed day secondary schools in Siaya County, Kenya. The findings are organized in line with the study objectives, which examined: (i) socio-cultural norms influencing ICT access and use, (ii) parental attitudes toward ICT engagement, (iii) the influence of gender roles on ICT participation, and (iv) school-level practices shaping gendered ICT disparities.

The analysis integrates quantitative results from student questionnaires with qualitative insights from interviews, focus group discussions (FGDs), observations, and document reviews. Tables and figures are used to summarize statistical patterns, while narrative excerpts provide contextual interpretation of lived experiences.

Demographic Profile of Respondents

The study was conducted across ten (10) public mixed day secondary schools in Siaya County. A total of 200 students participated, alongside teachers, parents/guardians, school administrators, and one education officer.

Table 4.1: Distribution of Respondents by Category

Category	Male (N)	Female (N)	Total (N)
Students	100	100	200
Teachers	10	10	20
Parents/Guardians	10	10	20
Administrators	-	-	10
Education Officer	1	-	1
Total	121	120	241

The equal representation of boys and girls enabled balanced comparison of ICT access, usage patterns, and learning outcomes across gender groups. Inclusion of multiple stakeholder categories ensured a holistic understanding of digital inequality across household, institutional, and policy contexts.

Distribution of Respondents by School

Each of the ten schools contributed equal numbers of student respondents and key informants to ensure comparability across institutions.

Table 4.2: Distribution of Respondents Across Schools

School	Boys	Girls	Teachers	Parents	Administrators
Siaya Township	10	10	2	2	1
Mulaha Mixed	10	10	2	2	1
Holy Cross Mixed	10	10	2	2	1

Karapul Secondary	10	10	2	2	1
Mbaga Mixed	10	10	2	2	1
Agoro Oyombe	10	10	2	2	1
Obambo Mixed	10	10	2	2	1
Ambrose Adeya Adongo	10	10	2	2	1
Hono Secondary	10	10	2	2	1
Ulafu Secondary	10	10	2	2	1
Total	100	100	20	20	10

This uniform distribution allowed systematic cross-school comparison of ICT infrastructure, participation patterns, and gender disparities.

Distribution of Respondents by Data Collection Methods

Table 4.3: Respondents by Data Collection Method

Method	Male	Female	Total
Questionnaires (Students)	100	100	200
FGDs (Students)	50	50	100
Interviews (Teachers/Admin/Parents)	25	25	50
Education Officer Interview	1	-	1
Observations	-	-	10 schools
Document Review	-	-	10 schools

The convergence of multiple methods strengthened validity and enabled triangulation of findings across quantitative and qualitative datasets.

Socio-Cultural Norms, Parental Attitudes, and Gender Roles Influence Students’ Access to and Use of Digital Technologies

Influence of Societal Norms on ICT Engagement

The findings demonstrate that socio-cultural norms are a central determinant of how students access and use ICT in rural secondary schools in Siaya County. Beyond the presence or absence of infrastructure, ICT engagement is shaped by deeply embedded cultural beliefs about gender-appropriate behaviour, morality, and domestic responsibility. These norms systematically structure who is expected to use technology, how it should be used, and under what conditions access is considered acceptable.

From a theoretical perspective, these findings strongly align with Gender Socialization Theory, which argues that gendered behaviours are learned and reinforced through interaction with family, school, and community institutions. In the present study, socio-cultural norms operate as socializing mechanisms that position boys as autonomous and competent users of digital technologies, while girls are constructed as supervised and constrained users whose engagement must remain controlled and justified.

The quantitative evidence in Table 4.7 illustrates a consistent pattern of gendered regulation of ICT access.

Table 4.7: Influence of Societal Norms and Parental Attitudes on ICT Access (Students’ Perspective, N=200)

Factor Identified	Boys Reporting (%)	Girls Reporting (%)	Noted Impact
Parents restricting device use to education only	12%	46%	Girls’ ICT use highly monitored and time-limited
Chores interfering with ICT access at home	8%	67%	Girls spend less time online, especially evenings

Perception that ICT distracts girls from schoolwork	14%	42%	More restrictions placed on girls
Cultural/religious beliefs discouraging girls' ICT exposure	4%	28%	Girls excluded from ICT-related events
Encouragement to pursue ICT-related subjects	32%	18%	Boys more motivated to join ICT clubs

The data reveal a clear asymmetry in how ICT engagement is socially regulated. Girls are significantly more likely than boys to experience restrictive supervision, reduced discretionary time, and competing domestic obligations. For instance, 46% of girls reported parental restriction on device use compared to only 12% of boys, while 67% of girls indicated that household chores interfered with ICT access.

This pattern suggests that ICT access is not merely a matter of availability but is socially conditioned through gendered expectations of responsibility. Boys are more frequently encouraged to explore ICT and STEM-related subjects, while girls' engagement is often constrained by household duties and moral oversight.

From the standpoint of Social Role Theory, these differences reflect culturally constructed expectations that assign boys to public, technical, and future-oriented roles, while girls are oriented toward domestic and caregiving responsibilities. ICT therefore becomes a gendered resource embedded within broader systems of social organization rather than a neutral educational tool.

The qualitative findings deepen this understanding by showing how socio-cultural norms operate through everyday practices that regulate girls' time, mobility, and autonomy.

One Form Three girl explained:

"I can only use the school's computer lab when the teacher is present. At home, my mother says too much time online will make me forget my cooking duties."

This account illustrates how girls' ICT engagement is continuously negotiated against domestic expectations. Digital access is not treated as an independent educational right but as an activity subordinate to household responsibilities. The phrase "forget my cooking duties" highlights the persistent framing of girls' identities in relation to domestic competence, even within formal education environments that increasingly require digital literacy.

Similarly, a girl described unequal time allocation within the household:

"When I come from school, I have to sweep the compound, wash dishes, and help my mother prepare supper. My brother, who is in Form 2, finishes his homework quickly and then gets the phone to research or chat. By the time I am free, my parents say it's late, and I should rest."

This narrative demonstrates how ICT exclusion is produced through unequal distribution of domestic labour. Although boys and girls attend the same schools, their after-school experiences differ significantly. Boys are granted discretionary time that enables exploration of digital tools, while girls' time is consumed by unpaid household responsibilities.

This finding extends Van Dijk's Digital Divide Theory, particularly the second-level divide (usage gap), by showing that inequality is not only about skills or access, but also about socially structured control over time. In this context, domestic labour functions as an indirect but powerful mechanism of digital exclusion.

The study also found that girls' ICT participation is shaped by social surveillance and peer reinforcement of gender expectations. During FGDs, several participants reported being discouraged from frequent ICT use due to moralized interpretations of their behaviour.

One girl noted:

“Why are you always on the computer? Are you chatting with boys?”

Although often framed as casual remarks, such comments function as mechanisms of social policing that discourage girls from sustained engagement with technology. Over time, these experiences contribute to self-censorship and reduced confidence in ICT spaces. This finding aligns with Judith Butler’s theory of gender performativity, which explains how repeated social interactions reinforce normative gender identities.

A further finding concerns the symbolic absence of women in visible ICT roles within schools. Across several institutions, students reported that male teachers predominantly handled ICT equipment and technical demonstrations.

One girl from a Secondary stated:

“I’ve never seen a female teacher switch on the projector. If they want it used, they send a boy to go call another teacher.”

This observation highlights the importance of representation in shaping students’ perceptions of technological competence. The repeated association of ICT with male authority contributes to the symbolic construction of technology as masculine territory.

The consequences of this symbolic exclusion emerged clearly in another participant’s reflection:

“Our female teachers are kind and helpful, but they always ask someone else to fix the screen. Madam teaches us computer theory but has never shown us how to use it practically. If she can’t do it, how can I?”

This observation is analytically significant because it highlights the role of representation in shaping digital identity formation. When girls rarely see women confidently engaging with technology, they begin to associate technological competence with masculinity. Technology becomes symbolically coded as “male territory.”

This statement further reveals the profound influence of role modeling in shaping girls’ self-perception. The issue is not merely technical competence, but visibility and confidence. Girls construct their own sense of possibility from what they observe around them. The absence of female digital authority therefore quietly reinforces the belief that advanced technological engagement belongs to men.

The data reveals a deeply embedded cultural pattern in which girls’ access to ICT is mediated by parental caution, societal norms, and traditional gender expectations. In many households, even when devices are present, girls’ screen time is often capped to one or two hours and strictly tied to “educational purposes.”

Parental Attitudes and Institutional Perceptions of ICT Access

Parental attitudes emerged as a decisive mediating force in shaping students’ access to and use of ICT, particularly among girls. Across households, school settings, and community structures, ICT was rarely perceived as a neutral educational resource. Instead, it was filtered through moral, safety, and reputational concerns that systematically shaped who could access digital technologies, how often, and under what conditions. These perceptions interacted with institutional practices and community norms to produce a layered system of gendered regulation in ICT participation.

Table 4.8 summarizes the perspectives of teachers, parents, and administrators, revealing a shared logic of differentiated control and supervision in ICT access.

Table 4.8: Perspectives from Teachers, Parents, and Administrators (N=45)

Stakeholder Group	Common View Expressed	Frequency (%)	Implication
Teachers	Parents warn against involving girls in ICT to “protect morality”	33%	Girls miss out on training opportunities

Parents	ICT should be supervised for girls; boys can be trusted more	54%	Creates gender gap in independent learning
Administrators	Some community leaders oppose girls going to ICT competitions outside school	21%	Limits exposure and confidence

The pattern in Table 4.8 reflects a dominant logic of protective restriction, in which girls’ ICT engagement is subjected to heightened surveillance and stricter moral regulation compared to boys. This asymmetry not only reduces girls’ exposure to ICT learning opportunities but also constrains their ability to develop autonomy, confidence, and independent problem-solving skills in digital environments.

These institutional and parental expectations were echoed in teachers’ observations of classroom dynamics. A teacher noted:

“Some girls will simply hand over the mouse to the boys without argument because they’ve grown up hearing that technology is for men.”

This account illustrates how gendered expectations are internalised through repeated social messaging. Girls’ apparent passivity in ICT contexts is therefore not innate but socially produced, shaped by long-standing cultural narratives that associate technological competence with masculinity and authority with boys. Within this framework, ICT spaces become sites where gender hierarchies are actively reproduced rather than neutral learning environments.

Parental narratives further reinforce this pattern, particularly through concerns framed around morality and safety rather than educational development. A school principal reported a parent stating:

“My child is not going to those computer rooms unless she is doing her exams. I don’t want her getting into bad habits on the internet.”

Similarly, a father explained:

“Phones are good for schoolwork, but my daughter does not need to chat with strangers at night.”

Although these statements reflect protective intentions, they function in practice as mechanisms of surveillance that regulate girls’ digital autonomy. ICT engagement for girls is thus conditionally permitted and largely restricted to supervised academic use, while broader forms of exploration, communication, and creativity are discouraged. Boys, in contrast, are granted greater trust and flexibility in their digital engagement.

Institutional practices were also found to reinforce these culturally embedded assumptions. A principal acknowledged:

“We are not supposed to discriminate, but when you have only five working computers, you give them to the boys who have shown interest in technical subjects. The girls are more in the home science room.”

This statement reveals how resource scarcity interacts with gender stereotypes to produce structurally unequal outcomes. Boys are implicitly perceived as more naturally suited to technical work, leading to their prioritization in ICT access during constrained resource allocation. Over time, such practices contribute to the masculinization of technological competence, where ICT proficiency becomes socially associated with male identity and capability.

These patterns are further reflected in broader stakeholder attitudes presented in Table 4.9.

Table 4.9: Parents’ and BOM Attitudes towards Girls’ ICT access

Attitude/Practice	Parents (N=14)	BOM (N=10)
Boys given priority in device access	10 (71%)	8 (80%)
Girls’ access restricted for safety/morality concerns	9 (64%)	6 (60%)

Equal access encouraged	4 (29%)	3 (30%)
Belief ICT is more important for boys' future careers	11 (79%)	7 (70%)
Willingness to invest in girls' ICT training	5 (36%)	4 (40%)

The data in Table 4.9 shows a clear tendency among both parents and Board of Management members to prioritize boys in ICT access and to associate technological competence more strongly with male future careers. A majority of parents (79%) and BOM members (70%) believed that ICT skills are more relevant for boys' future livelihoods. Although a smaller proportion expressed support for equal access and investment in girls' ICT training, these views remain secondary within the dominant gendered framing of technological opportunity.

Collectively, these findings demonstrate that parental attitudes, reinforced by institutional practices and community beliefs, operate as powerful structural mechanisms shaping ICT inequality. This operates not only through direct restriction but also through subtle processes of expectation, surveillance, and gendered role differentiation.

These attitudinal patterns are reflected in actual student ICT engagement outcomes across schools. Girls consistently reported higher levels of restricted ICT time, ranging from 57% to 68%, compared to only 14% to 22% among boys. The consistency of this pattern across different institutional contexts indicates that the digital divide is not incidental but structurally embedded within broader socio-cultural expectations of gender.

The most frequently cited constraints among girls included evening domestic chores, caring for siblings, cooking, cleaning, and household errands. These responsibilities significantly reduced their discretionary time for ICT engagement. In contrast, boys' after-school time was largely available for leisure, academic revision, and independent digital exploration. This demonstrates that ICT access is shaped not only by physical availability of devices but also by unequal control over time, mobility, and domestic labour.

The case of Ulafu Secondary further illustrates this disparity, where 68% of girls reported limited ICT access compared to 14% of boys. Girls attributed this to "household responsibilities and lack of free time," highlighting what feminist scholarship conceptualizes as time poverty, the disproportionate burden of unpaid domestic labour that limits participation in educational and developmental activities. In this context, digital inequality reflects broader structural inequalities within household labour arrangements.

Similarly, in Hono Secondary, 66% of girls reported restricted ICT access due to "fetching water and household errands." This demonstrates how rural livelihood demands intersect with gender norms to intensify digital exclusion. Where domestic survival tasks are labour-intensive, girls disproportionately shoulder responsibility, further limiting their sustained engagement with ICT and reinforcing structural inequality in learning opportunities.

Qualitative narratives provide further insight into these statistical patterns. A Form Three girl explained:

"I can only use my brother's smartphone after completing all evening chores and even then under supervision."

This statement illustrates the conditional nature of girls' ICT access, where usage is permitted only after fulfilling domestic obligations and remains subject to monitoring. ICT engagement is therefore not treated as an independent learning right but as a regulated privilege contingent on household responsibilities.

In contrast, boys described significantly greater autonomy. A Form Two boy from Siaya Township stated that after school he could spend "as long as he wanted" engaging with online content such as football highlights and science materials without interference. This contrast highlights a critical inequality: boys not only access ICT more freely but also exercise greater control over their time. This autonomy enhances experimentation, confidence, and cumulative skill development—advantages that are less available to girls.

These disparities are further reinforced by dominant social expectations regarding future roles. Several girls noted that boys were perceived as needing ICT skills more urgently because they were being prepared for formal employment and public life, whereas girls were expected to prioritize domestic competence. This aligns with Social Role Theory, which explains how societies allocate roles and opportunities based on culturally

constructed expectations of masculinity and femininity. Within this framework, boys are associated with innovation and leadership, while girls are associated with caregiving and obedience.

Despite these entrenched patterns, the findings also indicate emerging signs of transformation. Some school administrators and teachers introduced targeted interventions to support girls' ICT participation. For example, a deputy principal from Karapul Secondary reported organizing separate ICT sessions for girls to encourage participation without male dominance. Additionally, a small number of parents in more urbanized contexts expressed increasingly progressive attitudes toward girls' digital futures.

These instances demonstrate that gender norms are not fixed but socially constructed and therefore open to negotiation and change through institutional intervention and shifting social expectations.

Overall, the findings show that ICT inequality in rural secondary schools is sustained through an interconnected system of parental attitudes, institutional practices, household labour distribution, and socio-cultural expectations. Access to digital technologies is shaped not only by material availability but also by deeply embedded beliefs about who is entitled to time, trust, autonomy, and opportunity in digital spaces.

Gender Roles and ICT Participation

Domestic Responsibilities and ICT Exclusion

The findings demonstrate that gender roles are a central determinant of ICT participation among students, operating primarily through the unequal distribution of domestic labour within households. Across the sampled schools, girls consistently shoulder a disproportionate share of household responsibilities, which significantly reduces their available time for ICT engagement. Boys, in contrast, experience fewer domestic constraints and therefore retain greater discretionary time for digital learning, experimentation, and skill development.

From a theoretical standpoint, this pattern aligns with Social Role Theory, which posits that gendered divisions of labour are socially constructed, normalized, and continuously reproduced through everyday family and community practices. Within this framework, ICT access is not a neutral educational opportunity but is embedded within broader systems of gendered time allocation. The result is a structurally produced form of time poverty that disproportionately affects girls.

Table 4.10: Reported Impact of Traditional Gender Roles on ICT Access

School Name	Girls Reporting Limited ICT Time (%)	Boys Reporting Limited ICT Time (%)	Common Reason Reported by Girls
Siaya Township	58%	22%	Evening domestic chores
Agoro Oyombe	62%	18%	Caring for younger siblings
Hono Secondary	66%	15%	Fetching water and household errands
Ambrose Adeya Adongo	60%	20%	Cooking and cleaning
Mbaga Mixed	63%	17%	Limited parental permission for device use
Holy Cross Mixed	61%	19%	Chores and parental control over ICT time
Mulaha Mixed	59%	21%	Evening domestic work and cultural restrictions
Obambo Mixed	65%	16%	No ICT after sunset due to safety and cultural norms

Ulafu Secondary	68%	14%	Household responsibilities and lack of free time
Karapul Secondary	57%	20%	Domestic chores and school assignments

The data in Table 4.10 reveals a consistent and deeply embedded pattern in which girls’ ICT access is systematically constrained across all sampled schools. Girls reporting limited ICT time range from 57% to 68%, compared to a significantly lower range of 14% to 22% among boys. The uniformity of this disparity across diverse school contexts indicates that the digital divide is not incidental but structurally embedded within wider socio-cultural arrangements governing gender roles, labour distribution, and access to time.

The most frequently cited constraints among girls include evening domestic chores, caregiving for younger siblings, fetching water, cooking, cleaning, and parental restrictions on device use. These responsibilities collectively reflect a gendered allocation of unpaid domestic labour that significantly limits girls’ discretionary time for ICT engagement. Boys, on the other hand, are less frequently burdened with such tasks and therefore enjoy greater flexibility for after-school digital engagement and academic or recreational ICT use.

The findings therefore demonstrate that ICT inequality is not solely a matter of infrastructure or device availability but is fundamentally shaped by control over time and daily responsibilities. This reinforces the argument that digital inequality in this context is structured through social organization of household labour rather than access alone.

Qualitative evidence further strengthens this interpretation. The data reveals a deeply embedded cultural pattern in which girls’ ICT access is mediated by parental caution, social norms, and entrenched gender expectations. In many households, even where devices are available, girls’ screen time is tightly regulated, often capped at one or two hours and strictly framed within “educational purposes.”

A Form 3 girl explained:

“I can only use the school’s computer lab when the teacher is present. At home, my mother says too much time online will make me forget my cooking duties.”

Similarly, a parent stated:

“A girl must know how to take care of a family. If she spends too much time on a phone or computer, she may lose focus on her duties.”

These narratives illustrate a consistent underlying tension: girls’ ICT participation is socially accepted only when it aligns with academic purposes and does not disrupt expected domestic responsibilities. ICT use becomes conditional, monitored, and morally regulated, whereas autonomous or extended engagement is discouraged.

Within this context, technology is not perceived as a neutral learning tool but as a socially sensitive resource whose use must conform to dominant expectations of femininity, obedience, and domestic competence. Girls’ digital engagement is therefore tolerated only within restricted boundaries, while boys are granted broader autonomy in accessing and exploring ICT resources.

Overall, these findings highlight that domestic responsibilities and socio-cultural expectations jointly structure ICT exclusion, producing a gendered pattern of time poverty that limits girls’ participation in digital learning.

School-Level Practices and ICT Access

School-level practices emerged as a decisive institutional layer through which gendered inequalities in ICT access are actively reproduced and normalized. Although schools are formally positioned as equalizing institutions intended to mitigate socio-economic and cultural disparities, the findings indicate that everyday organizational routines, teacher decisions, and resource allocation practices frequently mirror, and in some cases

intensify, the gender hierarchies already present in households and communities. As a result, schools function not only as sites of learning but also as mechanisms of gendered social reproduction within the ICT domain.

A consistent set of institutional patterns was observed across the sampled schools:

1. Informal prioritization of boys for ICT-related tasks and opportunities
2. Teacher-led selection of boys for hands-on technical operations (e.g., device setup, troubleshooting, demonstrations)
3. Persistent underrepresentation of girls in practical ICT engagement and leadership of digital activities
4. Allocation of limited ICT resources based on perceived “technical competence” rather than equitable access principles

These practices, though often informal and rationalized as efficiency-driven responses to limited resources, systematically privilege boys’ exposure to ICT tools and reinforce gendered assumptions about technological ability. Over time, such repeated exposure produces cumulative advantages for boys in confidence-building, procedural familiarity, and digital fluency, while simultaneously constraining girls’ experiential learning.

From the perspective of Gender Socialization Theory, these dynamics position schools as secondary but powerful agents of socialisation. Rather than neutral environments, classrooms and ICT laboratories become sites where gendered expectations are continuously reinforced through everyday interactions. Teachers, often unintentionally, reproduce dominant societal beliefs that associate technical competence, problem-solving, and digital leadership with boys. Girls, in contrast, are subtly directed toward observational roles or non-technical responsibilities, which limits their opportunity to develop hands-on proficiency. In this way, gender inequality in ICT is not only imported into schools from the household but is actively reinforced within institutional practice.

This institutional reproduction of gender norms is particularly significant because it operates through routine pedagogical decisions rather than explicit discrimination. The cumulative effect of such decisions is the normalization of boys’ dominance in ICT spaces and the gradual internalization among girls of lower technological self-efficacy. Consequently, girls are less likely to volunteer for ICT tasks, less confident in experimentation, and more likely to defer to male peers during collaborative digital activities.

The findings also align strongly with Digital Divide Theory, particularly the third-level divide, which emphasizes inequality in outcomes rather than mere access. In this context, even where girls and boys share nominal access to ICT infrastructure, the quality, depth, and nature of engagement differ significantly. Boys’ greater participation in hands-on tasks translates into higher levels of digital literacy, problem-solving competence, and preparedness for STEM-related academic pathways. Girls, by contrast, experience restricted interaction with ICT systems, which limits skill accumulation and perpetuates downstream inequalities in academic performance and career readiness.

Taken together, the evidence demonstrates that school-level ICT practices are not neutral administrative routines but active mechanisms through which gendered digital inequality is produced and sustained. The institutional environment thus plays a critical mediating role between broader socio-cultural norms and individual ICT outcomes, reinforcing rather than disrupting existing patterns of gender stratification in digital learning.

Analytical Synthesis and Theoretical Advancement

This study makes a significant conceptual contribution by demonstrating that gendered ICT inequality in rural Kenyan secondary schools is not the product of isolated or independent factors, but rather the outcome of a multi-layered system of social reproduction operating across interconnected domains. ICT inequality emerges as a structurally embedded phenomenon shaped through the interaction of household, school, and cultural systems that collectively reinforce gendered patterns of access and participation.

At the household level, inequality is shaped by parental control mechanisms, moral surveillance, and an unequal distribution of domestic labour, all of which constrain girls' time, autonomy, and opportunity for ICT engagement. At the school level, institutional allocation practices, teacher expectations, and patterns of ICT exposure further reproduce these disparities by differentially positioning boys and girls in practical technology use. At the cultural level, deeply embedded normative beliefs regarding gender roles, morality, technology, and appropriate femininity or masculinity provide the ideological foundation that legitimizes and sustains these practices.

Taken together, these domains form an interlocking and mutually reinforcing structure that continuously reproduces ICT inequality, even in contexts where technological infrastructure is available.

Original Contribution to Knowledge

The study advances existing scholarship in three key ways. First, it introduces the concept of a “socially regulated digital space”, in which access to ICT is determined not only by material availability but also by gendered norms, moral expectations, and continuous social surveillance. This reconceptualizes ICT access as a socially negotiated process rather than a purely technical or infrastructural condition. Second, it extends Digital Divide Theory by introducing a time-based and autonomy-based dimension of digital inequality. The findings demonstrate that inequality is not limited to access or usage, but is also shaped by differential control over time and freedom of digital engagement, both of which are critical determinants of meaningful participation.

Third, the study shows that ICT inequality in rural education systems is primarily reproduced through everyday social practices, including domestic labour allocation, parental monitoring, and classroom interaction patterns. This shifts the explanatory focus away from infrastructural deficits alone and foregrounds the role of routine social processes in sustaining inequality.

Qualitative Themes on Gendered ICT Access

Thematic analysis generated four interrelated and dominant themes: gender norms and ICT participation, parental control and digital restriction, school-based ICT allocation practices, and digital confidence and autonomy differentials. These themes collectively illustrate the multi-dimensional nature of gendered ICT inequality across social settings. Across all themes, a consistent pattern emerged. Girls reported significantly lower levels of ICT confidence, largely attributed to restricted exposure, limited opportunities for hands-on practice, and persistent social discouragement. In contrast, boys demonstrated higher levels of autonomy, experimentation, and sustained engagement with digital technologies, resulting in cumulative advantages in digital skill development and confidence formation over time.

Integration of Findings

A strong convergence was observed between quantitative and qualitative findings. Statistical evidence of gender disparities in ICT access was consistently reinforced by qualitative accounts highlighting unequal domestic workload distribution, parental surveillance and moral regulation, culturally constructed expectations of femininity and domestic responsibility, and institutional bias in ICT allocation and participation.

There was minimal divergence between the two datasets, indicating strong methodological triangulation and reinforcing the reliability and robustness of the findings. The integration of both strands of evidence confirms that ICT inequality is not merely perceived at the level of attitudes or experiences, but is structurally produced and consistently reproduced across multiple social contexts.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary of the Study

This study examined how socio-cultural norms, parental attitudes, gender roles, and school-level practices influence students' access to and use of Information and Communication Technology (ICT) in selected rural

secondary schools in Siaya County, Kenya. The study was motivated by persistent gender disparities in ICT participation despite increasing availability of digital technologies in schools.

The findings demonstrate that ICT inequality is not primarily a product of infrastructural limitations, but is deeply embedded in social relations and everyday practices. Across the sampled schools, girls consistently experienced more restricted access to ICT resources compared to boys. These disparities were shaped by interrelated factors operating at household, school, and cultural levels.

At the household level, parental control, moral surveillance, and unequal distribution of domestic labour significantly reduced girls' time and autonomy for ICT engagement. Girls were more likely to be assigned domestic responsibilities such as cooking, cleaning, fetching water, and caregiving, which limited their opportunities for digital learning.

At the school level, institutional practices often reinforced existing gender biases. Boys were more frequently selected for hands-on ICT tasks, given priority in the use of limited digital devices, and perceived as more competent in technical activities. Girls, in contrast, were underrepresented in practical ICT engagement and often relegated to passive roles.

At the cultural level, deeply entrenched gender norms shaped expectations regarding appropriate behaviour for boys and girls. ICT use among boys was largely perceived as normal, progressive, and career-oriented, whereas girls' engagement was frequently subjected to moral scrutiny and concerns about safety and propriety.

Conclusions of the Study

The study concludes that ICT access and participation in rural secondary schools in Siaya County are strongly shaped by gendered socio-cultural structures rather than by technology availability alone.

First, gender roles remain a dominant determinant of ICT engagement, with girls disproportionately affected by domestic labour demands that result in persistent time poverty. This limits their ability to develop ICT skills at the same pace as boys.

Second, parental attitudes play a critical role in regulating ICT use, particularly for girls. Protective and moral concerns, although often well-intentioned, result in restricted access, reduced autonomy, and limited digital exploration opportunities.

Third, school-level practices inadvertently reproduce societal gender inequalities. Teachers' expectations, resource allocation decisions, and participation patterns collectively favour boys and reinforce perceptions of male technological superiority.

Fourth, the study establishes that ICT inequality is a multi-layered and self-reinforcing system operating across household, school, and cultural domains. These domains interact to produce a continuous cycle of exclusion that cannot be addressed through infrastructure provision alone.

Overall, the study concludes that gendered ICT inequality is structurally embedded and socially reproduced through everyday practices, expectations, and institutional arrangements.

Recommendations

Based on the findings, the study makes the following recommendations:

Policy and Government-Level Interventions

1. The Ministry of Education should integrate gender-responsive ICT policies that explicitly address disparities in access, participation, and digital skills development.
2. National ICT-in-education programmes should incorporate strategies that go beyond infrastructure provision to include gender equity and digital inclusion frameworks.

3. Community sensitization programmes should be implemented to challenge harmful gender norms that restrict girls' ICT participation.

School-Level Interventions

1. Schools should adopt structured ICT allocation policies that ensure equal participation of boys and girls in practical ICT sessions.
2. ICT clubs and digital literacy programmes should be designed with deliberate inclusion targets for girls.
3. Teachers should receive training on gender-responsive pedagogy to reduce unconscious bias in classroom ICT practices.
4. Schools should create safe and supportive ICT learning environments that encourage girls' active experimentation and participation.

Household and Community-Level Interventions

1. Parent-teacher associations should be engaged in awareness programmes highlighting the importance of equal ICT opportunities for boys and girls.
2. Community leaders should be involved in addressing cultural beliefs that associate ICT competence primarily with boys.
3. Household-level sensitization should encourage equitable distribution of domestic responsibilities to reduce girls' time poverty.

Gender Empowerment and Capacity Building

1. Targeted mentorship programmes should be established to expose girls to female role models in ICT and STEM fields.
2. Schools and NGOs should support girls' participation in ICT competitions, clubs, and digital innovation programmes.
3. Digital literacy initiatives should prioritize building girls' confidence, autonomy, and hands-on technical competence.

Areas for Further Research

Future studies should:

1. Explore longitudinal impacts of gendered ICT access on academic performance and career pathways.
2. Examine how digital gender inequalities evolve in urban versus rural contexts.
3. How emerging technologies (such as mobile learning platforms and AI tools) may either reduce or reinforce existing disparities.

REFERENCES

1. Afolabi, O., & Olumide, T. (2022). Gendered perceptions of digital technology use among adolescents in West Africa. *Journal of African Media Studies*, 14(3), 245–260.
2. Ahmed, F. A., et al. (2025). How do social norms influence the sexual and reproductive health-related attitudes and behaviours of very young adolescents in Sub-Saharan Africa? A scoping review. *BMC Public Health*.
3. Akwara, E., & Idele, P. (2020). The moral and social narratives of sexual and reproductive health in Kenya. *Reproductive Health*, 17(75).
4. Banić, L., & Orehovački, T. (2024). A comparison of parenting strategies in a digital environment: A systematic literature review. *Multimodal Technologies and Interaction*, 8(4), 32.

5. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
6. Bussey, K., & Bandura, A. (2020). Social cognitive theory of gender development and differentiation. *Psychological Review*, 127(5), 1019–1051.
7. Eagly, A. H., & Wood, W. (2020). The nature–nurture debates: 25 years of challenges in understanding gender differences. *Perspectives on Psychological Science*, 15(1), 34–51.
8. FAWE Kenya. (2022). Gender and ICT access in Kenyan schools: Policy brief. Forum for African Women Educationalists.
9. Fobellah, E. D. (2026). Cultural norms and gender socialisation: Barriers to girl-child education in contemporary African societies. *Global Journal of Political Science and Administration*.
10. GSMA. (2022). Connected women: The mobile gender gap report. GSM Association.
11. International Telecommunication Union (ITU). (2023). Facts and figures: Measuring digital development. ITU.
12. Kenya Institute of Curriculum Development. (2023). Competency-Based Curriculum implementation guidelines. Government of Kenya.
13. Kipkosgei, K. (2026). Gender disparities in digital literacy and STEM participation in Sub-Saharan Africa. *African Journal of Education and Technology*.
14. Livingstone, S., & Blum-Ross, A. (2020). Parenting for a digital future: How hopes and fears about technology shape children’s lives. Oxford University Press.
15. Matolo, L. N. (2026). Cultural values and educational transitions of girls: A systematic literature review. *Asian Journal of Education and Social Studies*, 52(1), 560–570.
16. Mochache, V., & Wanje, G. (2020). Religious, socio-cultural norms and gender stereotypes influence uptake and utilization of maternal health services among the Digo community in Kwale, Kenya. *Reproductive Health*, 17(71).
17. Muasya, S. (2024). Gender, ICT access and digital inequality in rural Kenyan schools. *Journal of Education and Development in Africa*.
18. Muathe, S., & Otieno, J. (2020). ICT integration and learning outcomes in Kenya’s education system. *International Journal of Education and Development Using ICT*.
19. Mukhongo, L. (2022). Digital literacy programme and education reform in Kenya. *Kenya Education Review Journal*.
20. Ndaka, A., Ratemo, H., Oppong, A., & Majiwa, E. (2024). Artificial intelligence (AI) onto-norms and gender equality: Unveiling invisible gender norms in AI ecosystems in Africa. arXiv.
21. Nichols, S., & Selim, N. (2022). Digitally mediated parenting: A review of the literature. *Societies*, 12(2), 60.
22. Njagi, J. (2024). Gender disparities in ICT access and usage among learners in Kenya. *African Journal of Educational Research*.
23. OECD. (2021). Bridging the digital gender divide. Organisation for Economic Co-operation and Development.
24. Ragnedda, M., & Muschert, G. W. (2021). The digital divide: The internet and social inequality in international perspective. Routledge.
25. Ridgeway, C. L. (2021). Framed by gender: How gender inequality persists in the modern world. Oxford University Press.
26. UNESCO. (2023). Global education monitoring report: Technology in education – A tool on whose terms? UNESCO.
27. UNICEF. (2022). Children in a digital world. United Nations Children’s Fund.
28. van Dijk, J. (2020). The digital divide. Polity Press.
29. Watson, J., Baier, J., Mughogho, W., & Millrine, M. (2023). An exploratory investigation into the factors related to EdTech use among Kenyan girls. University of Cambridge Repository.
30. Wildermuth, N. (2021). Gender norms and digital inequality in Sub-Saharan Africa. *African Communication Research Journal*.
31. World Bank. (2021). Digital development in education: Global evidence report. World Bank Group.
32. Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.