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Secondary Schools in Mandera county-Kenya**



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The Role of Digital Tools in School Administration in Rural Secondary Schools in Mandera county-Kenya

 **Dr. Adan Maalim Hussein**

Education Department, Garissa University

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Abstract

Purpose: This study examined the use of digital resources in the administration of rural secondary schools in Kenya. Guided by the Technology Acceptance Model, the research investigated the availability of digital tools, their utilization in school management, challenges affecting implementation, and their impact on administrative efficiency.

Methodology: Using a descriptive survey design, data were collected from principals, deputy principals, and ICT teachers through questionnaires and interviews and analyzed using descriptive statistics and thematic analysis.

Findings: The findings showed that digital resources are only partially available in most rural schools. Mobile phones were the most accessible tools, while computers, internet connectivity, and School Management Systems were less available. Digital technologies were mainly used for communication through SMS and WhatsApp, with limited application in record management, reporting, and decision-making. Key challenges included inadequate infrastructure, limited funding, insufficient technical skills, lack of technical support, and resistance to change. Despite these constraints, digital resources were found to enhance administrative efficiency by improving communication, data accuracy, accountability, transparency, and decision-making.

Unique Contribution to Theory, Policy and Practice: The study concludes that digital technologies have significant potential to improve school administration, but their integration remains incomplete in rural secondary schools. It recommends increased investment in ICT infrastructure, staff training, internet connectivity, and technical support to promote effective digital integration in school management.

Keywords: *Digital Tools, School Administration, Secondary Schools*

1.1 Introduction

The integration of digital technology into education has transformed school operations worldwide. Beyond supporting teaching and learning, digital tools such as School Management Information Systems, online communication platforms, digital record systems, and data management software have improved administrative efficiency by enhancing record keeping, communication, reporting, and decision-making processes. In developed countries, digital technologies are widely used in school administration to improve accountability, transparency, and service delivery. Similarly, developing countries, including Kenya, have embraced ICT integration through initiatives such as the Digital Literacy Programme (DLP) and policies that promote the use of technology in educational management. These efforts aim to support efficient school administration and align education with national development goals.

Despite these initiatives, the adoption of digital technologies in school administration remains uneven, particularly between urban and rural schools. While many urban schools have implemented computerized systems for managing student records, finances, and communication, rural secondary schools often rely on manual procedures. Challenges such as inadequate infrastructure, unreliable internet connectivity, limited ICT equipment, insufficient technical support, inadequate digital skills, and financial constraints hinder effective technology integration in rural schools.

The use of digital technologies in school administration has the potential to improve efficiency, accuracy, communication, transparency, and evidence-based decision-making. However, research has largely focused on ICT use in teaching and learning, with limited attention given to its role in school administration, especially in rural secondary schools. This study therefore examines the use of digital technologies in the administration of rural secondary schools in Kenya, focusing on their availability, utilization, challenges, and influence on administrative effectiveness.

1.2 Statement of the Problem

Despite increased efforts by the Kenyan government and educational stakeholders to promote the integration of Information and Communication Technology (ICT) in schools, many rural secondary schools continue to rely on manual administrative systems. These traditional methods are often inefficient, time-consuming, and prone to errors, affecting key administrative functions such as record management, communication, financial management, and decision-making. As a result, school administrators face difficulties in delivering services effectively and responding promptly to emerging administrative needs.

While previous studies have largely focused on the use of ICT in teaching and learning, limited research has examined the role of digital technologies in school administration, particularly in rural secondary schools. Consequently, there is inadequate information on the availability and utilization of digital technologies, the challenges affecting their implementation, and their contribution to administrative efficiency. This knowledge gap hinders the development of effective

policies and strategies for digital transformation in rural schools. Therefore, this study seeks to investigate the role of digital technologies in the administration of rural secondary schools in Kenya, with a focus on their availability, utilization, implementation challenges, and influence on administrative effectiveness.

1.3 Objectives of the Study

This research aims to explore how digital instruments contribute to improving the management of rural secondary schools in Kenya and to pinpoint the obstacles preventing their efficient application.

1.4.1 General Objective

To examine the role of digital tools in school administration in rural secondary schools in Kenya.

1.4.2 Specific Objectives

- To assess the availability of digital tools in rural secondary schools
- To examine how digital tools are used in administrative processes
- To identify challenges affecting the adoption of digital tools
- To evaluate the impact of digital tools on administrative efficiency

1.5 Research Questions

- What digital tools are available in rural secondary schools in Kenya?
- How are digital tools utilized in school administration?
- What challenges hinder the adoption of digital tools?
- How do digital tools affect administrative efficiency?

1.6 Significance of the Study

This investigation holds significance for various stakeholders within the education sector, especially those involved in supporting educational growth, shaping policy, managing schools, and conducting research. The findings are expected to illuminate how digital tools are employed in the administrative functions of rural secondary schools in Kenya, focusing on their availability, utilization, difficulties encountered, and their effect on administrative effectiveness (Kiprono & Mutua, 2023; UNESCO, 2024).

1.7 Scope of the Study

This study focuses on the use of digital technologies in the administration of rural secondary schools in Kenya. It examines how ICT supports key administrative functions such as record management, communication, and decision-making. The study specifically investigates the availability and utilization of digital technologies and the challenges affecting their implementation. Data will be collected from principals, deputy principals, and ICT teachers who

are directly involved in school administration. The research is limited to administrative functions and excludes teaching and learning activities except where they influence administration.

1.8 Limitations of the Study

The study's reach, methods, and interpretation of findings may be affected by several constraints. A primary difficulty is the restricted access to certain remote rural secondary schools in Kenya. Challenges such as inadequate road networks, geographical isolation, and infrastructure issues, which are typical in rural research settings (World Bank, 2023; Omondi & Were, 2023), can make reaching some schools problematic. This could hinder the researcher's capacity to involve a larger participant group, potentially diminishing the extent to which the results can be generalized.

1.9 Study Boundaries

This research will exclusively concentrate on public rural secondary schools in mandera County-Kenya. The selection of public rural schools is based on their prevalence in rural areas and their greater likelihood of encountering common challenges related to ICT infrastructure, funding, and administrative support (Ministry of Education Kenya, 2022; World Bank, 2023). This focused approach ensures an accurate depiction of the current state of digital tool adoption within rural school administration (UNESCO, 2024).

2.0 Literature Review

2.1 Introduction

This chapter reviews literature on the use of digital technologies in school administration, focusing on rural secondary schools in Kenya. It examines access to digital technologies, their application in administrative activities, challenges affecting their adoption, and their contribution to administrative efficiency. The chapter also discusses the Diffusion of Innovations Theory, which guides the study.

The integration of Information and Communication Technology (ICT) in education has become increasingly important worldwide because it improves communication, information management, and decision-making processes within institutions. Digital technologies such as computers, internet services, mobile phones, printers, scanners, and School Management Systems (SMS) have transformed administrative operations in many schools. These technologies facilitate efficient record keeping, communication, report generation, and data management. However, despite global advancements in ICT adoption, significant disparities remain between developed and developing countries, as well as between urban and rural schools.

In Kenya, the government has introduced several initiatives to promote ICT integration in education, including the Digital Literacy Programme and the National ICT Frameworks. These initiatives seek to improve teaching, learning, and administrative processes through technology. Although these efforts have contributed to increased ICT awareness and adoption, their implementation has been uneven across different regions. Rural secondary schools continue to

face considerable challenges that limit access to and effective use of digital technologies. These challenges include inadequate infrastructure, poor internet connectivity, unreliable electricity supply, limited financial resources, and insufficient technical support.

Research shows that many rural secondary schools still rely heavily on manual administrative systems. Activities such as student registration, record keeping, fee management, communication, and report preparation are often conducted manually, resulting in delays, inefficiencies, and increased workload for school administrators. The limited use of digital technologies affects administrative effectiveness and the quality of decision-making. Studies further indicate that successful ICT integration depends on the availability of infrastructure, ICT skills among staff, and institutional support.

Access to digital technologies remains one of the greatest challenges facing rural secondary schools in Kenya. Digital tools are essential for enhancing efficiency in school administration, yet their availability remains limited and unevenly distributed. According to Kiptalam and Rodrigues (2010), most rural schools possess inadequate ICT facilities compared to urban schools. Many schools have few computers, lack functional computer laboratories, and experience poor internet access. Even where computers are available, they are often outdated or poorly maintained due to inadequate financial and technical support. Consequently, school administrators are unable to fully utilize digital technologies in managing school operations.

Financial constraints also contribute significantly to limited ICT access. Rural schools often operate under restricted budgets and prioritize essential needs such as infrastructure development, staffing, and instructional materials. As a result, investment in ICT equipment, software, and maintenance remains insufficient. Furthermore, unreliable electricity and internet services continue to hinder the effective use of digital technologies in many rural areas. These factors contribute to a persistent digital divide between rural and urban schools.

The study is anchored on the Diffusion of Innovations Theory developed by Everett Rogers in 1962. The theory explains how innovations and technologies spread within a social system over time. Rogers argues that adoption is influenced by communication channels, social structures, culture, and individual perceptions. The theory is relevant to this study because it helps explain why some school administrators adopt digital technologies more readily than others.

According to Rogers (2003), innovation adoption occurs through five stages: knowledge, persuasion, decision, implementation, and confirmation. Knowledge involves becoming aware of an innovation and understanding its functions. Persuasion occurs when individuals develop attitudes toward the innovation. Decision refers to choosing whether to adopt or reject it. Implementation involves actual use of the innovation, while confirmation occurs when users evaluate the outcomes and decide whether to continue using it.

The theory also categorizes adopters into innovators, early adopters, early majority, late majority, and laggards. In educational institutions, administrators vary in their willingness and speed of

adopting digital technologies. Some readily embrace technological changes, while others are reluctant due to limited skills, lack of confidence, or resistance to change.

Rogers further identifies five characteristics that influence the adoption of innovations. These include relative advantage, compatibility, complexity, trialability, and observability. Relative advantage refers to the extent to which an innovation is perceived to be superior to existing methods. Compatibility concerns how well the innovation aligns with existing values and practices. Complexity refers to the ease or difficulty of using the innovation. Trialability involves the opportunity to test the technology before full implementation, while observability refers to the visibility of the benefits resulting from its use. These factors significantly influence whether school administrators adopt and effectively utilize digital technologies.

In conclusion, the literature demonstrates that digital technologies have the potential to improve school administration through enhanced communication, efficient record management, and better decision-making. However, rural secondary schools in Kenya continue to face challenges related to infrastructure, finances, internet connectivity, electricity supply, and ICT skills. The Diffusion of Innovations Theory provides a useful framework for understanding the factors influencing technology adoption among school administrators. The reviewed studies reveal the need for further research on strategies that can enhance access to and utilization of digital technologies in rural secondary school administration, thereby improving administrative efficiency and overall school performance.

RESEARCH METHODOLOGY

3.0 Introduction

This chapter provides a comprehensive and detailed description of the methodology that was employed to investigate the function of digital tools in school administration in rural secondary schools in Kenya, with particular focus on Mandera County. It explains in depth the systematic procedures and techniques that were followed in collecting, analyzing, and interpreting data to ensure that the findings are accurate, reliable, and relevant to the research objectives. The chapter clearly outlines the research design adopted for the study, the study location, the target population, the sampling techniques and sample size, the data collection instruments used, the procedures for data analysis, and the ethical considerations that guided the entire research process.

3.1 Research Design

This study adopted a descriptive survey research design to examine the function of digital tools in school administration in rural secondary schools in Kenya, with particular reference to Mandera County. The descriptive survey design was considered appropriate because the study sought to investigate and describe existing conditions without altering or manipulating any variables. The main objective was to obtain detailed information about the current status of digital tool availability, the extent of their use in administrative processes, and the challenges encountered in their implementation. Since the research aimed to capture real-life practices and experiences as

they naturally occur within schools, a descriptive approach provided a suitable framework for achieving this goal.

3.2 Target Population

The target population refers to the entire group of individuals who possess specific characteristics relevant to a particular study and from whom the researcher intends to collect data. It represents the complete set of subjects that meet the criteria established for investigation. In this study, the target population comprised individuals directly involved in school administration and ICT implementation in rural secondary schools in Kenya, specifically within Mandera County. These individuals were selected because they are actively engaged in decision-making, operational management, and the practical use of digital technologies in schools. Their roles place them in a strategic position to provide accurate and meaningful information regarding the integration and effectiveness of digital tools in school administration.

The study targeted a total of 30 respondents drawn from rural secondary schools in Mandera County. This group consisted of 10 principals, 15 deputy headmasters, and 5 ICT teachers. The selection of these categories was deliberate and purposeful, as each group performs distinct yet complementary roles in school management and ICT integration. By including representatives from each administrative level, the study ensured a balanced and comprehensive understanding of how digital tools are utilized within the school system.

3.3 Sampling Techniques and Sample Size

Sampling refers to the systematic process of selecting a portion of individuals from a defined target population in such a way that the selected group adequately represents the entire population. It is an essential step in research because it allows the researcher to draw meaningful conclusions about a larger group without necessarily studying every individual. In this study, sampling was carefully designed to ensure that all key categories of respondents involved in school administration and ICT implementation in rural secondary schools in Mandera County were fairly and adequately represented.

3.4 Data Collection Methods

Data collection methods refer to the systematic tools and procedures that a researcher uses to gather relevant information needed to answer the research questions and achieve the objectives of the study. The choice of data collection methods is very important because it directly influences the accuracy, reliability, and validity of the findings. In this study, data collection methods were carefully selected to ensure that comprehensive and meaningful information was obtained regarding the function of digital tools in school administration in rural secondary schools in Mandera County, Kenya.

3.4 Questionnaires

Structured questionnaires were used as one of the primary data collection instruments and were administered to headmasters, deputy headmasters, and ICT teachers in rural secondary schools in Mandera County. The use of structured questionnaires was considered appropriate because they allow the researcher to collect standardized information from a relatively large group of respondents in a systematic and efficient manner. The questionnaire was carefully designed to align with the research objectives and to ensure that all relevant aspects of the study, including the availability, usage, challenges, and impact of digital tools in school administration, were adequately captured.

3.5 Data Analysis

Data analysis involved a systematic process of organizing, summarizing, and interpreting the collected data in order to answer the research questions and achieve the objectives of the study. After data collection, the raw information obtained from questionnaires was carefully examined to ensure completeness, accuracy, and consistency. This step was important because it helped the researcher identify and correct any errors, omissions, or unclear responses before proceeding to the actual analysis.

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This section details the examination, explanation, and display of information gathered from participants regarding the function of digital resources in the administrative processes of rural secondary schools in Kenya. The outcomes are structured and explored in alignment with the study's research aims, encompassing the accessibility of digital tools, their application in administrative tasks, the obstacles hindering their implementation, and their impact on administrative effectiveness.

The gathered information underwent analysis using both descriptive statistical methods and thematic analysis. Descriptive statistics, such as frequencies and percentages, were employed to scrutinize quantitative data sourced from surveys. The outcomes are depicted in tables and graphs for improved clarity and straightforward comprehension. Thematic analysis was applied to examine qualitative data obtained from interviews, with responses being grouped into principal themes corresponding to the study's objectives.

4.2 Participation Level

This part of the report details the participation level of the study, considering the questionnaires distributed and received back, alongside engagement in interviews. The participation level is significant because it influences how sufficient and trustworthy the gathered data is for examination.

A total of 30 questionnaires were given to participants, who included school heads, deputy heads, and IT educators. Of these, 27 questionnaires were received back in good condition, yielding a total participation rate of 90%. This rate is deemed satisfactory for analysis and deriving conclusions.

The specifics of the participation rate are shown in the table below:

Table 1: Response Rate

Category	Issued	Returned	Percentage (%)
Principals	10	9	90%
Deputy Principals	15	13	86.7%
ICT Teachers	5	5	100%
Total	30	27	90%

Besides the questionnaires, interviews were held with chosen participants, specifically school heads and IT educators. Of those invited for interviews, the majority took part completely, leading to a high engagement rate that supplied valuable qualitative information for the research.

In summary, the substantial participation rate suggests a strong desire from respondents to be involved in the research. This bolsters the credibility and accuracy of the results, as the data gathered adequately represents the intended group.

4.3 Respondent Demographics

This part details the demographic profiles of the individuals who took part in the research. Its aim is to offer foundational data about the participants, aiding in the comprehension of how their attributes might impact the adoption of digital instruments within school management.

4.3.1 Respondent Gender Breakdown

The research aimed to determine the gender distribution among the participants in order to assess the level of gender representation in positions related to school administration and ICT utilization in rural secondary schools. Understanding the gender composition of respondents was important because gender can influence leadership participation, decision-making processes, and the adoption and use of digital technologies in school administration.

Table 2: Gender Distribution

Gender	Frequency	Percentage (%)
Male	16	59.3%
Female	11	40.7%
Total	27	100%

The findings revealed that 16 respondents were male, representing 59.3% of the total respondents. This indicates that males formed the majority of the participants involved in the study. The relatively higher proportion of male respondents suggests that men continue to occupy a larger share of administrative and ICT-related positions in rural secondary schools.

4.3.2 Respondent Work History

The research also investigated the duration of time participants had been employed in school administration or positions related to Information and Communication Technology (ICT). This was important in determining the level of professional experience among the respondents and understanding how experience may influence the use and management of digital tools in school administration.

Table 3: Respondent Work History

Years of Experience	Frequency	Percentage (%)
1–5 years	6	22.2%
6–10 years	10	37.0%
11–15 years	7	25.9%
Above 15 years	4	14.8%
Total	27	100%

The findings revealed that 6 respondents had worked for between 1–5 years, representing 22.2% of the total respondents. This indicates that a relatively smaller proportion of participants were still in the early stages of their professional careers in school administration or ICT-related roles.

4.3.3 Respondent Educational Attainment

The study additionally looked into the educational backgrounds of the participants in order to assess their academic and professional preparedness for managing ICT-dependent administrative duties in rural secondary schools.

Table 4: Respondent Educational Attainment

Qualification	Frequency	Percentage (%)
Diploma	5	18.5%
Bachelor's Degree	15	55.6%
Postgraduate Diploma	4	14.8%
Master's Degree	3	11.1%
Total	27	100%

The findings revealed that 5 respondents held Diploma qualifications, representing 18.5% of the total respondents. This indicates that a smaller proportion of participants possessed middle-level professional training relevant to educational administration and ICT-related activities. Diploma holders are likely to have acquired foundational knowledge and practical skills necessary for supporting administrative operations within schools.

4.3.4 Respondent ICT Education

The study also aimed to ascertain whether participants had undergone any ICT training relevant to school administration. This was important because ICT training equips school administrators and ICT personnel with the necessary knowledge and technical skills required to effectively utilize digital tools in managing school operations. The level of ICT training among respondents was therefore considered essential in understanding their preparedness to implement and operate ICT-based administrative systems.

Table 5: Respondent ICT Education

ICT Training	Frequency	Percentage (%)
Trained	18	66.7%
Not Trained	9	33.3%
Total	27	100%

The findings revealed that 18 respondents had received some form of ICT training, representing 66.7% of the total respondents. This indicates that the majority of participants possessed basic ICT knowledge and competencies necessary for performing administrative tasks using digital technologies.

4.4.1 Computer Availability in Schools

The study sought to establish the availability of computers in rural secondary schools because computers are among the most important digital tools used in modern school administration. Computers support various administrative activities such as preparation and storage of records, report writing, financial management, communication, data processing, and operation of digital management systems.

Table 6: Computer Availability in Schools

Availability of Computers	Frequency	Percentage (%)
Available	19	70.4%
Not Available	8	29.6%
Total	27	100%

The findings revealed that 19 respondents indicated that computers were available in their schools, representing 70.4% of the total respondents. This suggests that the majority of rural secondary schools have adopted computers to support administrative operations. The relatively high availability of computers may be attributed to government ICT initiatives, donor support, and increasing awareness of the importance of technology in educational management.

4.4.2 Internet Access in Schools

The study also examined the availability of internet access in rural secondary schools. Internet connectivity is a critical component of digital administration because it enables online communication, access to educational and administrative information, electronic reporting, operation of School Management Systems, and interaction with education stakeholders.

Table 7: Internet Access in Schools

Internet Access	Frequency	Percentage (%)
Available	10	37.0%
Not Available	17	63.0%
Total	27	100%

The findings revealed that only 10 respondents indicated that their schools had internet access, representing 37.0% of the total respondents. This indicates that a relatively small proportion of rural secondary schools have internet connectivity. Schools with internet access are likely to benefit from improved communication, easier access to online resources, efficient sharing of information, and faster administrative operations.

4.4.3 School Management System (SMS) Availability

The study further examined the availability of School Management Systems (SMS) in rural secondary schools. School Management Systems are digital platforms designed to support administrative functions such as student record management, attendance tracking, financial management, report generation, communication, and storage of institutional information.

Table 8: School Management System (SMS) Availability

School Management System	Frequency	Percentage (%)
Available	7	25.9%
Not Available	20	74.1%
Total	27	100%

The findings revealed that only 7 respondents indicated that their schools had School Management Systems, representing 25.9% of the total respondents. This suggests that only a small proportion of rural secondary schools have adopted digital management systems in their administrative

operations. Schools with School Management Systems are likely to experience improved efficiency in handling administrative tasks and managing institutional data.

4.4.4 Mobile Phone Usage in Administration

The study further examined the use of mobile phones in school administration within rural secondary schools. Mobile phones are among the most accessible and widely used digital tools because they support communication, coordination, information sharing, and administrative decision-making.

Table 9: Mobile Phone Usage in Administration

Mobile Phone Use	Frequency	Percentage (%)
Yes	25	92.6%
No	2	7.4%
Total	27	100%

The findings revealed that 25 respondents indicated that mobile phones were used in school administration, representing 92.6% of the total respondents. This demonstrates that mobile phones are the most widely available and utilized digital devices in rural secondary schools.

4.4.5 Availability of Printers/Scanners

The study also examined the availability of printers and scanners in rural secondary schools. Printers and scanners are important digital devices used in school administration for printing reports, preparing official documents, duplicating records, scanning documents for electronic storage, and supporting digital record management systems.

Table 10: Availability of Printers/Scanners

Printers/Scanners	Frequency	Percentage (%)
Available	15	55.6%
Not Available	12	44.4%
Total	27	100%

The findings revealed that 15 respondents indicated that printers and scanners were available in their schools, representing 55.6% of the total respondents. This suggests that slightly more than half of the rural secondary schools possessed these devices.

4.5.1 Use of Digital Tools in Communication

This section examined the use of digital communication tools such as email, SMS, and WhatsApp in the administration of rural secondary schools. Communication is an essential administrative function because it supports coordination, dissemination of information, decision-making, and interaction among administrators, teachers, students, parents, and education stakeholders.

Table 11: Use of Digital Tools in Communication

Communication Tool	Always	Sometimes	Never
Email	6 (22.2%)	10 (37.0%)	11 (40.7%)
SMS	18 (66.7%)	7 (25.9%)	2 (7.4%)
WhatsApp	20 (74.1%)	6 (22.2%)	1 (3.7%)

The findings revealed that email was the least utilized communication tool among the respondents. Only 6 respondents, representing 22.2%, indicated that they always used email for communication, while 10 respondents, representing 37.0%, stated that they sometimes used it.

4.5.2 Record Keeping

This section examined the use of digital tools in managing school records such as student data, attendance records, and examination records. Effective record management is important in school administration because it supports proper documentation, data storage, monitoring, and decision-making processes.

Table 12: Use of Digital Tools in Record Keeping

Record Type	Always	Sometimes	Never
Student Data	9 (33.3%)	12 (44.4%)	6 (22.2%)
Attendance Records	7 (25.9%)	13 (48.1%)	7 (25.9%)
Examination Records	8 (29.6%)	11 (40.7%)	8 (29.6%)

The findings revealed that digital tools were moderately utilized in the management of student data. A total of 9 respondents, representing 33.3%, indicated that they always used digital tools for student data management, while 12 respondents, accounting for 44.4%, stated that they sometimes used them. However, 6 respondents, representing 22.2%, reported that they never used digital tools for managing student information.

4.5.3 Decision-Making

This subsection examined the extent to which digital tools support administrative decision-making in rural secondary schools. Specifically, the study focused on the use of digital data for planning and report generation.

Table 13: Use of Digital Tools in Decision-Making

Decision-Making Function	Always	Sometimes	Never
Use of Data for Planning	5 (18.5%)	14 (51.9%)	8 (29.6%)
Report Generation	6 (22.2%)	13 (48.1%)	8 (29.6%)

The findings revealed that only 5 respondents, representing 18.5%, always used digital data for planning purposes, while 14 respondents, accounting for 51.9%, indicated that they sometimes used digital data in planning. However, 8 respondents, representing 29.6%, reported never using digital data for planning activities.

4.6.1 Insufficient ICT Infrastructure

This section examined whether inadequate ICT infrastructure affects the adoption and utilization of digital tools in rural secondary school administration.

Table 14: Insufficient ICT Infrastructure

Response Category	Frequency	Percentage (%)
Strongly Agree	14	51.9%
Agree	9	33.3%
Neutral	2	7.4%
Disagree	2	7.4%
Strongly Disagree	0	0%

The findings revealed that 14 respondents, representing 51.9%, strongly agreed that insufficient ICT infrastructure is a major obstacle to digital tool adoption in schools. In addition, 9 respondents, accounting for 33.3%, agreed with the statement. Combined, this means that 85.2% of the respondents acknowledged that inadequate ICT infrastructure significantly hinders effective integration of digital technologies in school administration.

4.6.2 Limited ICT Proficiency

The study also investigated whether inadequate ICT skills among school personnel affect the implementation of digital tools in school administration.

Table 15: Limited ICT Proficiency

Response Category	Frequency	Percentage (%)
Strongly Agree	10	37.0%
Agree	12	44.4%
Neutral	3	11.1%
Disagree	2	7.4%
Strongly Disagree	0	0%

The findings revealed that 10 respondents, representing 37.0%, strongly agreed that limited ICT proficiency among personnel hinders effective use of digital tools. Furthermore, 12 respondents, accounting for 44.4%, agreed with the statement.

This means that a combined 81.4% of respondents believed that inadequate ICT skills among school personnel negatively affect implementation and utilization of digital technologies in school administration.

4.6.3 Financial Limitations

The study further examined the extent to which financial constraints affect adoption of digital technologies in rural secondary school administration.

Table 16: Financial Limitations

Response Category	Frequency	Percentage (%)
Strongly Agree	13	48.1%
Agree	10	37.0%
Neutral	2	7.4%
Disagree	2	7.4%
Strongly Disagree	0	0%

The findings revealed that 13 respondents, representing 48.1%, strongly agreed that financial limitations significantly affect ICT adoption in schools. Additionally, 10 respondents, accounting for 37.0%, agreed with the statement.

This indicates that a combined 85.1% of respondents acknowledged that inadequate financial resources are a major challenge in implementation of digital tools within rural secondary schools.

Only 2 respondents, representing 7.4%, remained neutral, while another 2 respondents, accounting for 7.4%, disagreed. No respondent strongly disagreed.

4.6.4 Reluctance to Embrace Change

The study also sought to determine whether resistance or reluctance to adopt new technologies affects implementation of digital tools in school administration.

Table 17: Reluctance to Embrace Change

Response Category	Frequency	Percentage (%)
Strongly Agree	9	33.3%
Agree	11	40.7%
Neutral	4	14.8%
Disagree	3	11.1%
Strongly Disagree	0	0%

The findings revealed that 9 respondents, representing 33.3%, strongly agreed that reluctance to embrace change hinders adoption of digital tools. In addition, 11 respondents, accounting for 40.7%, agreed with the statement.

4.6.5 Inadequate Technical Assistance

The study further investigated whether lack of technical support affects effective utilization of digital tools in rural secondary schools.

Table 18: Inadequate Technical Assistance

Response Category	Frequency	Percentage (%)
Strongly Agree	11	40.7%
Agree	10	37.0%
Neutral	3	11.1%
Disagree	3	11.1%
Strongly Disagree	0	0%

The findings revealed that 11 respondents, representing 40.7%, strongly agreed that inadequate technical assistance is a major challenge in ICT implementation. Additionally, 10 respondents, accounting for 37.0%, agreed with the statement.

4.7.1 Communication Speed

This section examined the influence of digital tools on communication speed in rural secondary school administration.

Table 19: Influence on Communication Speed

Response Category	Frequency	Percentage (%)
Strongly Agree	12	44.4%
Agree	10	37.0%
Neutral	3	11.1%
Disagree	2	7.4%
Strongly Disagree	0	0%

The findings revealed that 12 respondents, representing 44.4%, strongly agreed that digital instruments improve communication speed in school administration. Additionally, 10 respondents, accounting for 37.0%, agreed with the statement.

4.7.2 Record Accuracy

The study also examined the influence of digital tools on the accuracy of administrative records. Accurate record keeping is important in school administration because it supports effective planning, reporting, accountability, and decision-making.

Table 20: Influence on Record Accuracy

Response Category	Frequency	Percentage (%)
Strongly Agree	11	40.7%
Agree	11	40.7%
Neutral	3	11.1%
Disagree	2	7.4%
Strongly Disagree	0	0%

The findings revealed that 11 respondents, representing 40.7%, strongly agreed that digital tools improve accuracy in record management. Another 11 respondents, accounting for 40.7%, agreed with the statement.

4.7.3 Paperwork Reduction

The study further investigated whether digital tools contribute to reduction of paperwork in school administration. Traditional administrative systems in schools often involve large volumes of paper-based documentation, which may consume time, space, and financial resources.

Table 21: Paperwork Reduction

Response Category	Frequency	Percentage (%)
Strongly Agree	13	48.1%
Agree	9	33.3%
Neutral	3	11.1%
Disagree	2	7.4%
Strongly Disagree	0	0%

The findings revealed that 13 respondents, representing 48.1%, strongly agreed that digital instruments reduce paperwork in school administration. In addition, 9 respondents, accounting for 33.3%, agreed with the statement.

4.7.4 Enhanced Decision-Making

The study also sought to determine whether digital tools improve administrative decision-making within rural secondary schools. Effective decision-making depends on availability of accurate, timely, and reliable information.

Table 22: Influence on Decision-Making

Response Category	Frequency	Percentage (%)
Strongly Agree	10	37.0%
Agree	12	44.4%
Neutral	3	11.1%
Disagree	2	7.4%
Strongly Disagree	0	0%

The findings revealed that 10 respondents, representing 37.0%, strongly agreed that digital instruments improve decision-making in school administration. Furthermore, 12 respondents, accounting for 44.4%, agreed with the statement.

4.7.5 Transparency and Accountability

The study further examined the influence of digital tools on transparency and accountability in school administration. Transparency and accountability are important because they promote proper management of resources, accurate record keeping, and responsible administrative practices.

Table 23: Influence on Transparency and Accountability

Response Category	Frequency	Percentage (%)
Strongly Agree	9	33.3%
Agree	11	40.7%
Neutral	5	18.5%
Disagree	2	7.4%
Strongly Disagree	0	0%

The findings revealed that 9 respondents, representing 33.3%, strongly agreed that digital instruments enhance transparency and accountability in school administration. Another 11 respondents, accounting for 40.7%, agreed with the statement.

4.7.6 Comparative Evaluation: Traditional vs. Digital Methods

A comparison between traditional manual systems and digital systems shows significant differences in administrative efficiency. Manual systems are characterized by slow communication processes, leading to delays in information sharing and decision-making. Record keeping under manual systems is often prone to errors, misplacement, and loss of important documents. Additionally, manual administration generates large volumes of paperwork, making information management cumbersome and time-consuming. Decision-making is frequently based on limited or outdated information, while accountability and transparency remain low due to difficulties in tracking records and activities.

In contrast, digital systems enhance administrative effectiveness through fast and real-time communication among school stakeholders. Digital record-keeping ensures greater accuracy, security, and easy retrieval of information when needed. Automation significantly reduces paperwork, saving time and resources. Furthermore, digital technologies support data-driven and timely decision-making by providing administrators with up-to-date information. They also improve transparency, accountability, and traceability of administrative processes, making school management more efficient and reliable. Overall, digital systems offer substantial advantages over traditional manual methods in modern school administration.

4.9.6 Research Gap

Although numerous studies have examined the integration of Information and Communication Technology (ICT) in education, most have concentrated on its impact on teaching, learning, student performance, and digital literacy. Limited attention has been given to the role of digital technologies in school administration, particularly in improving administrative efficiency. Consequently, there is insufficient empirical evidence on how digital technologies support administrative functions such as record management, communication, financial management, reporting, and decision-making in secondary schools.

Additionally, existing studies have largely focused on urban and well-resourced schools where ICT infrastructure, internet connectivity, and technical support are relatively adequate. As a result, the findings may not accurately reflect the realities of rural secondary schools, which face distinct challenges including inadequate ICT infrastructure, unreliable electricity and internet services, limited funding, and insufficient ICT skills among administrators.

Furthermore, previous research has not adequately examined the extent to which digital technologies are available, utilized, and integrated into administrative processes in rural secondary schools. There is also limited information on the specific challenges that hinder their adoption and how these challenges affect administrative efficiency.

Therefore, this study seeks to fill these gaps by investigating the availability and utilization of digital technologies in school administration, identifying factors influencing their adoption, examining challenges affecting their effective use, and assessing their contribution to administrative efficiency in rural secondary schools in Mandera County, Kenya. The findings will provide evidence-based recommendations for enhancing digital technology integration in school administration within rural settings.

4.10 Recommendations of the Study

Based on the findings of the study on the availability, utilization, challenges, and impact of digital technologies in rural secondary school administration in Kenya, the following recommendations are proposed:

4.10.1 Strengthening ICT Infrastructure

The Ministry of Education, county governments, and school management boards should prioritize investment in ICT infrastructure in rural secondary schools. This should include the provision of adequate computers, reliable electricity, internet facilities, and modern School Management Information Systems (SMIS). Strengthening ICT infrastructure will enhance administrative efficiency, improve data management, and support effective communication within schools.

4.10.2 Capacity Building and ICT Training

School administrators, teachers, and support staff should receive continuous ICT training to improve their digital competencies and confidence in using technology for administrative purposes. Regular workshops, seminars, and professional development programs should be organized to equip school personnel with the necessary skills for operating digital systems. Enhanced ICT skills will promote effective utilization of available technologies and reduce resistance to technological change.

4.10.3 Expansion of Internet Connectivity and Technical Support

The government, in collaboration with ICT authorities and internet service providers, should expand affordable and reliable internet connectivity to rural secondary schools. Special educational internet packages should be introduced to support digital administration and online communication. Additionally, schools should be provided with technical support personnel to maintain ICT equipment, troubleshoot system failures, and ensure continuous operation of digital administrative systems. This will promote sustainable integration of digital technologies and improve overall administrative performance.

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