INFLUENCE OF ICT INTEGRATION MANAGEMENT ON ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN NYANDARUA WEST SUB COUNTY, NYANDARUA COUNTY, KENYA.

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DECLARATION AND APPROVAL

Declaration by the Student

I declare that this report is my work. All sources used have been duly acknowledged. This research has not been submitted for any other degree or examination in any other institution.

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I confirm the candidate has done the work reported in this report under my supervision.

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DEDICATION

This work is dedicated to my family and mentors whose unwavering support, inspiration, and encouragement fueled my pursuit of academic and personal excellence.

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I am thankful to God for the strength he granted me in completing this course. I am profoundly grateful to Dr. Josephine Kirimi, my supervisor, for her tremendous direction, encouragement, and support during my research endeavor and to Dr. Mary Mugwe for her unwavering support throughout my master's program. Their proficiency and guidance have been helpful in formulating our plan. I would want to express my gratitude to my family and friends for their unwavering support and inspiration during this endeavor. Their confidence in me has consistently served as a source of motivation. I appreciate everyone's participation in this project.

ABSTRACT

Student academic achievement depends heavily on educational administrators who use strategic Information and Communication Technology (ICT) implementations. An investigation evaluated the impact of ICT integration management on academic results in Nyandarua West Sub-County public secondary institutions within Nyandarua County of Kenya. The study focused on evaluating four essential goals, which included analyzing ICT integration management effects on academic outcomes and examining how schools use ICT to increase management performance, along with studying how decision-making practices respond to ICT implementation and reviewing administrator initiatives supporting ICT integration. The study applied a mixed-methods method grounded by technological determinism and organizational learning theories to address its research questions with a descriptive research design. The study used qualitative and quantitative data datacollection methods to achieve a thorough understanding of the research issue. A total of 1,774 participants from seven public secondary schools composed the target group, including seven principals, 196 teachers, and 1,571 students in Forms III and IV. The study chose 316 subjects from a population that was determined through the application of Krejcie and Morgan's sampling procedure. The four wards in this sub-county required stratified sampling to describe existing population differences in its implementation. This study relied on purposive selection of principals and teachers and simple random selection of students for participation in the research. The research utilized standardized questionnaires for teachers and students and semi-structured interviews for principals as data collection tools. An initial test of instruments was performed to establish both their reliability and validity as well as their credibility. The data analysis of quantitative information occurred through Statistical Package for Social Sciences (SPSS) and Microsoft Excel, which produced tables showing percentages. Interview data received qualitative analysis through thematic methods, which integrated with the quantitative results to meet the research goals. Effective ICT integration management practices create a strong positive link to better academic results in schools using thorough ICT strategies together with ongoing teacher training programs. The adoption of computer-mediated systems, including Student Information Systems and Learning Management Systems, enabled better administrative efficiency while enhancing communication practices as well as resource utilization in educational institutions. School administrators who incorporated real-time data analytics obtained through ICT gained the ability to make decisions using evidence-based interventions, which promoted an updated and data-informed management culture. The research established that successful integration of ICT relies on three major initiatives: leadership dedication, stakeholder involvement, and continuous capability development programs. The research identified multiple obstacles preventing teachers from embracing ICT in education because of insufficient hardware capabilities in rural areas and uneven teacher technology proficiency levels. The research advocates for improved restricting systems and dedicated sustainable ICT infrastructure investments for maximizing the potential of educational delivery. The research delivers key information for educational decision-makers, institution leaders, and teaching practitioners to boost ICT implementation for educational success in low-resourced educational environments.

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ACRONYMS AND ABBREVIATIONS

AFDB: African Development Bank

AU: African Union Commission

ICT: Information Communication Technology

ICTIM: ICT Integration Management

MoE: Ministry of Education

NACOSTI: National commission for Science, Technology and Innovation

OECD: Organization for Economic Co-operation

PSS: Public Secondary Schools

SPSS: Statistical Package for the Social Sciences

UNESCO: United Nations Educational, Scientific and Cultural Organization

UNICEF: United Nations International Children's Emergency Fund

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter explains the research problem, provides an overview of the backdrop of the study, lists the goals and research questions, and offers the justification, relevance, scope, and presumptions driving the study. Furthermore, it comprises a compilation of operational definitions for key terms employed throughout the inquiry.

1.1 Background of the Study

ICT significantly enhances the quality of teaching and learning by enhancing educational competency and facilitating various learning processes. Numerous empirical research works demonstrate the transformative effects of incorporating technology into learning environments. Lei et al. (2021) and Fernández-Gutiérrez et al. (2020) further affirm my claim that institutions that manage their ICT resources appropriately have had a higher tendency of performing better academically.

Sutrisno et al. (2023) and Villegas-Ch. et al. (2021) found that the adoption of ICT-based management systems in administration can effectively address concerns and challenges in secondary school management. Papadopoulos and Hossain (2023) extended these ideas and explained that integrating technology helps in strategic course decision-making and change in the class communication patterns, especially for problem-solving and analytical perspectives of learning.

This study aims to identify the barriers associated with Information and Communication Technology (ICT) deployment and their influence on academic performance in public secondary schools. Wu and

Wang contend that research on the critical elements of technological integration has not achieved consensus about infrastructure, technological capability, teacher preparation, policies, or strategies pertaining to the implementation of technology in education. Day et al. (2020) underscore the significance of proactive school leadership, extensive teacher professional development, and stakeholder involvement.

The present study, like others showing ICT use in Nigerian schools and classrooms by Adeyemi et al. (2019), makes it clear that purposeful use of the technologies enhances both student outcomes and the quality of education. While Kenya's digital literacy program is a national push to improve technology access, it is not without challenges, including a lack of infrastructure in schools, inadequate, often spoiled physical resources, and a lack of trained teachers.

Nyandarua County Education Report (2022) highlighted some of the challenges encountered locally, including poor learning facilities, few teachers trained in ICT, and weak health policies. Taken together, these results highlight the general and sustained argument for the replacement of the diffusion of technology for education, which is more equipment-oriented to planned and strategic change processes.

Table 1: ICT Integration Management and Academic Performance in Public Secondary Schools in Nyandarua West Sub-county (2020-2023)

Year	ICT Integration Rate (%)	Academic Performance Mean Score (%)	Teacher ICT Competency (%)
2020	15.3	5.2	28.4

2021	19.8	5.5	35.6
2022	23.4	5.9	42.3
2023	32.6	6.3	48.7

Source: Ministry of Education (2024)

Table 1 show that the passing standard has progressively risen from 5.2 to 6.3 through the integration of ICT, despite the difficulties that may arise owing to rural structure. The ICT competency of teachers has increased from 28.4% to 48.7%, indicating that while capacity-building interventions have been beneficial, they have been constrained by available resources, a common occurrence in most rural centers. The overall ICT integration rate has increased from the initial 15.3 percent to the current 32.6 percent, indicating significant progress in using technology to enhance learning. However, there is still significant potential to meet the growing demands of rural schools and boost academic performance, provided there is a corresponding improvement in resources and infrastructural support.

1.2 Statement of the Problem

The mean scores in Nyandarua West Sub-County public secondary schools continue to stay low despite continuous ICT implementation. Managing and integrating ICT tools poses challenges for educational transformation since implementation outcomes fail to correspond effectively with improved performance measures. Changing the mean scores from 5.2 to 6.3 over a four-year period does not indicate a high level of ICT integration—only 32.6% indicate underutilization of the available teaching tools. According to the latest data, the ICT competency of teachers has increased from 28.4% to 48.7%, yet more than half of the teaching staff still lacks the necessary ICT skills for

integration (Villegas-Ch., et al. 2021). Attempts to overcome these challenges, like capacity enhancement endeavors and enhancing infrastructure, have yielded poor results because of resource constraints characteristic of most rural areas (Villegas-Ch. et al. 2021). Despite the adoption of various interventions to enhance ICT's applicability, the advancement of digital reforms among students in rural schools remains slow, potentially constraining the development of academic achievement. However, scientific research has not yet explored the connection between ICT Integration Management and public secondary school performance in Nyandarua West Sub-county, leading to this study.

1.3 Purpose of the study

This study investigated how ICT integration management practices influence academic performance in public secondary schools in Nyandarua West Sub County, Nyandarua County, Kenya.

1.4 Objectives of the Study

1. To assess the influence of ICT integration management on students' academic performance in public secondary schools
2. To evaluate the effectiveness of ICT integration management strategies in enhancing school management for improved academic outcomes.
3. To examine how ICT integration management practices influence decision-making processes related to academic performance.
4. To identify initiatives by educational administrators that support effective ICT integration aimed at improving academic performance.

1.5 Research Questions

1. To what extent do ICT integration management practices influence students' academic performance in public secondary schools in Nyandarua West Sub-County?
2. What are the specific outcomes of ICT integration management strategies on the effectiveness of school management in public secondary schools?
3. In what ways do ICT integration management practices shape decision-making processes related to academic and administrative functions in public secondary schools?
4. What initiatives have school administrators implemented to facilitate effective ICT integration management for enhancing academic outcomes in public secondary schools?

1.6 Rationale for the Study

This research study primarily examined the influence of ICT integration management on the academic performance of public secondary schools. This study aimed to find out what the link is between high school students using technology in the classroom and how well they do in school. The results helped shape future educational and ICT policies and resource allocation plans that will help students do better in school by managing ICT integration better. This study ultimately enhances educational performance and, more widely, foster the advancement of secondary education in Nyandarua West Sub County, Nyandarua County, Kenya.

1.7 Significance of the Study

This study addresses this gap by examining the correlation between ICT integration management and the performance of public secondary schools. The benefits of this research arise from its capacity to enlighten educational stakeholders regarding the efficacy and influence of ICT utilization in

improving learning outcomes. This research develops knowledge in Nyandarua West Subcounty, Nyandarua County, Kenya, and improves the application of educational practices.

1.8 Scope of the Study

This study examines the influence of ICT integration management on academic achievement in public secondary schools. Ten public secondary schools, both day and boarding, located in Nyandarua West Sub County, Nyandarua County, hosted the research. One hundred thirty-five school personnel from all ten public secondary schools participated in the research by completing the distributed questionnaires.

1.9 Limitations of the study

1. Limited funding and personnel may have constrained the scope of data collection; however, focused sampling strategies and digital data collection tools were employed to optimize available resources.
2. Access to technology resources varied across schools, which may have influenced the uniformity of responses. This was mitigated by incorporating diverse schools from different wards and validating responses through triangulation.
3. Reliance on self-reported data may introduce response bias; to mitigate this, the study used both questionnaires and interviews to ensure data credibility.
4. The specific geographical scope limits generalizability to other counties; however, findings offer valuable insights applicable to similarly structured rural school systems.

1.10 Delimitations of the Study

1. The study focuses on secondary schools and may not include other educational levels, such as

primary or tertiary institutions.

2. The study examines technology integration and academic performance within secondary schools without delving extensively into historical trends or future projections.

1.11 Assumptions of the Study

1. The study assumes a certain degree of comparability among secondary schools within the research setting, allowing for meaningful comparisons and analyses across different institutions.
2. The study assumes that ICT integration management has the potential to influence academic performance, depending on various factors.
3. The study assumes that secondary schools in the research context have adopted technology to some extent for administrative purposes and that such adoption varies across schools.
4. The study assumes that the collected data is an accurate and reliable representation of the phenomena under investigation.

1.12 Operational Definitions of Key Terms

ICT Integration Management: This encompasses the coordination, authorization, and implementation of policies and strategies for integrating ICT resources, infrastructure, and culture in public secondary schools.

Academic Performance: The specific results of students' learning and achievements in different areas of education, such as educational achievements, test results, grades, graduation rates, and evaluations by teachers, principals, or other officials.

Influence: This refers to the degree to which ICT integration management practices have tangible and

measurable effects on academic performance in public secondary schools, as measured by numerical indices and perceived shifts in student participation.

The study concentrated on school management practices, the organizational and administrative procedures implemented to enhance the effectiveness of public secondary schools. These practices play a crucial role in the effectiveness of ICT integration management, underscoring the importance of your role as educational leaders and policymakers.

Effectiveness: The degree to which ICT integration management strategies enhance positive results in school management practices concerning efficiency, effectiveness, and overall organizational performance**.**

Decision Making: The procedure of determining, assessing, and selecting from the potential actions in school management, such as curricula, finance, staff, and strategic planning.

Initiatives: The following are some of the specific actions, strategies, or practices that educational leaders in public secondary schools have adopted. These initiatives have proven to be instrumental in supporting effective management of the integration of ICT, inspiring and motivating further progress in this area.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter analyzes the literature on ICT integration management's influence on academic performance in public secondary schools. What this article is about are the study's goals: to find out how ICT integration management affects academic performance in secondary schools; to see how well ICT integration management strategies improve school management; to find out how ICT integration management practices affect school management decisions; and to find out what educational administrators do to make ICT integration management work better in secondary schools. It also provides the theoretical and conceptual framework of the study.

2.1 Empirical Literature

2.1.1 The concept of ICT integration management in education.

The use of ICT in education has become imperative in order to prepare learners for challenges in the digital society and the acquisition of 21st-century skills. As stated by UNESCO (2019), effective management of ICT integration is possible only when strategic planning, infrastructure development, teacher training, and assessment are involved. Some of the challenges identified in the management of ICT integration in Africa include poor infrastructure, lack of personnel training, and lack of funding (African Union, 2018). However, the successful ICT integration models in African countries have improved the quality of education and the level of learners' participation. However, it requires much time, resources, and continuous improvement, particularly in Africa, due to poor infrastructure and the scarcity of skilled teachers.

2.1.2. The Concept of Academic Performance in Public Secondary Schools

Previous studies, such as those conducted by UNESCO and the African Development Bank, have outlined various factors that may influence a student's performance in academic work in secondary education. Researchers have found that students' motivation and socioeconomic status, along with organizational factors like leadership, curriculum, and learning environment, have significant influence (UNESCO, 2020). However, efforts are underway to tackle these challenges, aiming to improve the education system and its results. For instance, improving teacher training, improving access to learning resources, and promoting inclusive education have been useful in some African countries. All stakeholders, including policymakers, educators, and society, must ensure the elimination of barriers that impede access to quality secondary education. Therefore, to improve academic performance in secondary schools, we must first identify and understand the complex relationships between learners, their schools, and society, and then devise tailored ways to improve the situation for each school.

Numerous factors hinder secondary education in Africa, prompting various studies and policies to support the enhancement of public schools in the region. African secondary schools can enhance their education quality by implementing the following strategies: enhancing the quality of teacher training, updating the curriculum to align with current needs, and engaging the community in the education systems (UNICEF, 2021). For example, in Kenya, a study has found that teaching quality, learning resources, and student engagement are factors that influence academic achievement in public secondary schools (Kenya Ministry of Education, 2016). Similarly, other research conducted within the country has also highlighted other areas of concern, such as teacher absenteeism, poor teaching methodologies, and a lack of facilities in these institutions (Kagia & Muola, 2022). Therefore, intervention should go beyond the provision of infrastructure and materials to include

teacher training, improved teaching methods, and students' motivation and ownership, which will enhance the learning environment in Kenyan public secondary schools.

2.1.3 ICT Integration Management Practices on Academic Performance

Implementing the following effective strategies can enhance the incorporation of ICT into learning and increase student participation. The management of ICT assimilation is critical to the design of learning experiences and the improvement of learners' achievement. The effectiveness of ICT integration management practices is crucial to the improvement of students' learning experiences and academic achievement (Voogt et al., 2019). Scholars conducted a meta-synthesis of the literature on the relationship between ICT integration management practices and academic performance in secondary schools. There is a positive correlation between effective ICT integration management and educational performance (Fernández-Gutiérrez et al., 2020). Schools that have effective ICT integration management systems do better than schools that have low levels of ICT integration. Schools that effectively manage ICT integration in their institutions have seen improved academic performance. According to Lei et al. (2021), the students in the schools that had robust, comprehensive ICT integration management frameworks performed better than the students in the schools that had weak frameworks. However, the relationship between ICT integration management practices and academic performance is not straightforward. The findings show that there is a difference between the schools that have developed strategies for the integration of ICTs and the others. All the schools evaluated in this study exhibited varying levels of ICT integration management practices, yet some significantly improved their academic performance compared to the others.

Multiple research investigations show positive effects from ICT integration, yet they fail to agree on particular management techniques leading to the most significant improvement in educational results. The research studies merge ICT availability with integration effectiveness by not distinguishing between products and their actual utilization in practice. Current research provides minimal context about its reporting in rural environments or situations of resource constraint, which reduces the effectiveness of data interpretation for Nyandarua West settings.

2.1.4 The Effects of ICT Integration Management Strategies on Academic Achievement

The integration of ICT in education necessitates addressing teacher training, technological tools, and administrative backing. There is a need for proper support structures and frequent staff development in order to enhance the ability of the educators to effectively implement the management practices of ICT integration in teaching (Andri Sutrisno et al., 2023). The management of the integration of ICT in learning has consequences on performance. Adeyami et al. (2019) found that schools with well-equipped ICT integration coordination outperformed those with limited ICT resources. Furthermore, the implementation of ICT management in secondary education can lead to several benefits, such as enhanced content knowledge and comprehension (Mtebe & Raphael 2020). Consequently, implementing ICT management practices will assist in enhancing secondary education, especially in Nyandarua West.

Previous studies have also revealed a similar trend regarding the influence of managing ICT integration on academic performance in Kenya. Mwenda and Mutahi conducted a study among Kenyan secondary schools, finding that effective management of ICT for teaching and learning enhances students' performance. The study further reveals that schools that have embraced the integration of ICT in their LMS are likely to post better academic performances than the other

schools (Mwenda and Mutahi, 2018). Therefore, Mwangi and Kimani (2021) have found that the management of ICT practices enhances the learning achievements and academic results of learners in public secondary schools in Kenya. The study highlights the potential benefits of effective ICT integration management strategies for enhancing education in Nyandarua West Sub County, Nyandarua County, Kenya.

Ngugi and Odera (2021) studied how effective ICT integration management influences student results spanning different economic levels in Kenya. Strategic management of limited information and communication technology resources produced substantial academic advancements, according to their results. The study identified proper leadership and comprehensive ICT policies as key success determinants, surpassing the mere act of making technology available. Schools that established continuous monitoring mechanisms for ICT integration maintained their academic progress levels throughout different time periods. Nyandarua West Sub County should establish organized management systems above building more technological infrastructure since it faces difficulties in resource distribution.

Wafula et al.'s research from 2023 showed that over three years, national exam scores went up by 12% in 15 Kenyan secondary schools that had consistent administrative support for ICT-based learning. Schools achieving higher levels of student engagement through innovative teaching methods become possible when they set up teams consisting of administrators, teachers, and technical support personnel. Research shows that successful change management techniques play a crucial role for institutions while putting in place new information and communication technology systems. Sustainable management structures in Nyandarua West need to adapt to technological advancement while preserving pedagogical outcomes together with academic achievements.

Though it mostly shows a link between ICT integration techniques and academic outcome gains, the literature ignores important intervening factors, including teacher competence coupled with student ICT readiness together with policy implementation. The methods used in most reviewed research depend too heavily on subjective participant data that requires performance monitoring to achieve proper verification.

2.1.5 Effectiveness of ICT Integration Management Practices in Improving School Management Practices

ICT integration management in schools has continued to interest educational researchers in this context. This section will undertake the search of previous and current studies on the impact of ICT integration management practices on school managerial practices. This study was conducted by Andri Sutrisno et al. to determine the effect of ICT integration management strategies on school management practices (Andri Sutrisno et al., 2023). They concentrated on investigating the ICT-based management systems of administrative developments and coordination and communication between the stakeholders. ICT integration management strategies enhance the efficiency of the administrative work, utilization of resources, and the relationship between the stakeholders (Andri Sutrisno et al., 2023). Lee and Kim also looked at the impact of ICT integration management strategies on school management practices. They concluded that schools that have sound management policies on the implementation of ICT were more efficient and had better records management systems (Villegas-Ch. et al., 2021). Hence the use of ICT in management improves efficiency, effectiveness, and organizational performance.

Strategic planning and capacity building go hand in hand with the practices of ICT integration in order to improve organizational performance and resource management. Information and

Communication Technology is an important tool in the running and decision-making of schools all over the world. ICT integration management helps schools in different countries to make the right decisions because this management gets current information (Egea et al., 2020). Thus, the role of ICT integration management in increasing administrative efficiency, resource management, and decision support in learning institutions has been a popular area of research. Implementation is dependent on specific planning, staff development, and acknowledgment of the differences in the use of ICT tools in various schools.

Here are some of the steps that educational administrators have taken to manage ICT integration in public secondary education. These steps include leadership, staff development, and the development of infrastructure and equipment. Strategic activities of educational administrators play a major role in developing the ICT practices and improving the performances of the school management practices (Fernández-Gutiérrez et al., 2020). This is evidenced by research conducted in other parts of the world, including Africa, which has also emphasized the importance of the integration of ICT in the management of schools. ICT management practices influence school management practices in the implementation of the curriculum and the assessment procedures (Ssewanyana & Okiror 2019). To effectively address administration and governance challenges affecting Kenyan schools, it is worthwhile to examine aspects of ICT management (Ondari and Oboko, 2018). However, given the current integration of information communication technologies (ICT) in teaching and learning, and the significant influence that effective ICT management can have on school leadership practices, educational administrators in Kenyan public secondary schools should prioritize the management of ICT in teaching and learning to improve academic performance and results.

In Kenya, the application of ICT integration management practices was proved to enhance the management of schools at the local level. In their research on ICT integration management and

practices in school management, Kariuki and Mutua have identified some of the factors that enable school management, such as teacher training and development and infrastructural development (Kariuki & Mutua, 2017). Integrating ICT in Kenyan secondary schools calls for planning and stakeholders' involvement (Nzuki et al., 2020). Therefore, the results of the localized studies reveal that effective ICT integration management practices such as teacher training, infrastructure development, strategic planning, and stakeholders' involvement can significantly improve the efficiency of school administration and management in Kenyan public secondary schools.

2.1.6 Influence of ICT Integration Management Practices on Decision-Making

A literature review has been carried out in order to analyze the effects of integrating ICT in the management decision-making process. Fernández-Gutiérrez et al. (2020) in a qualitative study aimed at exploring how ICT Integration Management Practices influenced the decision-making of school administrators. They were also able to make understandings about the use of ICT tools and data analysis in decision-making in their day-to-day operations. Based on the literature review conducted by Fernández-Gutiérrez et al. (2020), real-time data and analytics enhance decision-making in curriculum, courses and programs, resources, and student services. Thus, managers and educational directors can develop policies that will help in learning with real-time information.

The aim of the case study that Papadopoulos and Hossain (2023) developed was to determine how the practices of ICT integration management and decision-making affect school administration. The study revealed that decision support systems that are based on ICT are crucial in data-driven decisions. ICT-based decision support systems helped the school leaders in making the right decisions and thus enhanced the results of education. According to Egea et al. (2020), ICT integration management improves the data management of schools worldwide while providing timely

information to managers to make the right decisions. In the view of Law et al. (2019), it is crucial to employ ICT tools like management information systems. These tools are very useful in enhancing the management and analysis of data with an aim of making sound decisions.

This paper established that the influence of ICT integration management practices on decision-making may depend on certain contextual factors. Villegas-Ch. et al. (2021) explained that some schools effectively applied ICT integration management practices for decision-making, whereas others experienced difficulties with data access and analysis. These challenges were attributed to the fact that the level of technology was not the same in all the regions. According to Andri Sutrisno et al. (2023), schools that incorporate ICT in their management systems have improved overall performance and data management and decision-making systems. Applying IT systems in managerial practices assists in the retrieval of information and provides appropriate channels.

Mwangi and Kamau (2022) performed research to explore the connection between ICT integration management practices and administrative efficiency in Kenyan secondary schools. The research team studied 32 Central Kenyan educational institutions while finding schools utilizing complete management information systems made decisions 40% quicker than conventional methods. Research findings confirm that IT-based decision-making effectiveness relies on three main components: strong data systems, trained administrator expertise, and standardized procedural data collection. These management systems provided uninterrupted administrative functionality to schools that faced unexpected interruptions because they operated through the cloud. The implementation of proper ICT integration frameworks would enable Nyandarua West Sub County schools to dramatically boost their administrative resilience capabilities.

The study by Okello and Wambua (2024) showed that educational institutions display varying decision-making capabilities when it comes to ICT integration management approaches. School leaders at these schools effectively implemented data-driven interventions by utilizing dashboards that integrated enrollment data with attendance, academic performance, and resource allocation information. Institutions that implemented established data governance policies realized a 35% enhancement in resource allocation efficiency. Successful ICT integration for decision-making demands more than installing technological infrastructure since it needs schools to adopt data-driven leadership within their organizational cultures. Nyandarua West requires thorough implementation of ICT governance systems that unite both administrative targets with educational strategic outcomes and technological capabilities.

2.1.7 Initiatives Employed by Educational Administrators to Facilitate Effective ICT Integration Management

Research has also been done on a study that sought to establish measures that have been taken by educational leaders to ensure effective ICT integration management in public secondary schools. The key strategies identified in the study included proactive leadership, professional development, and investment in infrastructure. Lei et al. (2021) assert that educational administrators have a responsibility to actively explore strategies for effectively managing the integration of ICT in teaching and learning. They are expected to develop policies that enable the integration of ICTs within learning institutions.

The goal of the study was to determine the management processes that the education administrators use in the integration of ICT in teaching and learning. They also emphasized the need to engage the stakeholders, plan, and evaluate the process. According to Fernández-Gutiérrez et al. (2020), the

educational administrator, therefore, plays a critical role in setting strategic plans, such as creating partnerships and assessing ICT integration for proper practices. The educational directors should ensure that they build and strengthen the relationship with the ICT firms to ensure that the integration is easy.

Other scholars emphasize the importance of strategic planning and capacity-building initiatives: The following are some of the strategies that global educational administrators have put in place to ensure effective management of ICT integration in schools: strategic planning, capacity building, and involvement of stakeholders. However, as pointed out by Andri Sutrisno et al. (2023), it is not straightforward to put in place measures that enhance the utilization of ICT in management. Their study revealed that there was a variation in the approaches that the schools used in the implementation of intervention measures for the integration of ICT. According to Andri Sutrisno et al. (2023), some schools were able to seamlessly incorporate ICTs in teaching and learning while others faced challenges such as lack of support and infrastructure. This is because most schools fail to attain integration objectives since they lack enough resources to support integration strategies.

Prior research seeks to ascertain the degree to which the strategies of educational leaders can facilitate the management of ICT integration. The authors assert that the most effective approaches were professional development, infrastructure, and governance. According to Villegas-Ch. et al. (2021), school administrators must offer professional development and infrastructural support to improve efficient ICT integration management practices. The African Union's Agenda 2063 has recognized the integration of ICT in education as a strategic objective that may aid leaders in realizing their vision (African Union Commission, 2015). Ssewanyana and Okiror (2019) assert that capacity building and policy are two critical variables that facilitate the efficient deployment of ICT in East African educational institutions. The outcomes of the current study indicate numerous

conclusions concerning the administration of ICT integration in public secondary schools in Kenya. The Digital Literacy Program seeks to provide students and educators with essential ICT competencies for learning.

Kamau and Njoroge (2023) discovered that transformational leadership operates as a vital element to successful ICT integration management within sub-Saharan African secondary schools. The study used 28 successful schools to show that administrators who were able to keep integration going for a long time came up with clear technology visions, set aside money for maintenance, and made plans for replacing equipment. The leaders focused on building educational spaces where teaching personnel could share their quality methods powered by technology. Administrators made decisions about educational purchasing through curricular system assessments to secure solutions that produced maximum impact. The research evidence suggests that educational leaders in Nyandarua West should develop standardized procedures for systematic integration management.

In 2022, Mugo and Gathungu found that using adaptive leadership models is an important way to set up ICT administrative integration systems that work well in a range of economic situations. Leaders who joined forces with private partners received extra monetary support and technical expertise in infrastructure development, thus enhancing long-term sustainability for integration programs. Educational leaders developed evaluation systems and monitoring methods that recorded evidence of improvements in teaching quality and student involvement. The study revealed that effective administrators kept communicating integration benefits to stakeholders through multiple channels for building widespread stakeholder support. Based on the research, Nyandarua West administrators should use community-based methods to keep support networks going beyond the confines of traditional schools.

2.2 Theoretical Literature Review

2.2.1 The Technological Determinism Theory

The technological determinism theory forms one of the theoretical frameworks used to explain the integration of ICT in learners' environments. This theory assumes that technology leads society and controls these people's actions. In the application of the theory, education demonstrates how technologies influence the methods of teaching and learning. What become clear from within this theoretical framework are the following axioms for the study of ICT in educational settings.

On the same theoretical premise, the Technology-Society Interaction principle holds that the integration of ICT influences school management practices and learners' performance. Among the previously highlighted leadership principles, the one that emphasizes the significance of technology in educational structures and processes stands out as the key. It acknowledges that advancements in technology in all aspects lead to similar improvements in educational approaches and learning achievements. The principle also defines the relationship between technological advancement and educational advancement.

For the purpose of this technological change, the Leadership and Infrastructure principle, aligned with Lei et al. (2021), acknowledges the significance of strategic leadership in facilitating ICT integration. This pertains to the establishment of appropriate structures and resources, as well as the requirement for adequate funding to ensure successful implementation. It highlighted the importance of staff development for the successful integration of ICT. It also demonstrates how the principle applies to systematic planning for resource application in the use of educational technology.

Fernández-Gutiérrez et al. (2020) confirmed the Data-Driven Decision Making principle, which relates to the improvement of administrative activities supported by technologies. The following principle shows how live feed and real-time analytical tools enhance management effectiveness. It prioritizes systematic data analysis as the theme of the management of education. The principle also fosters the establishment of fact-based decision-making within school systems.

According to Villegas-Ch. et al. (2021), the novel principle known as the Management Strategy Integration covers the systematic ICT integration for the proper integration and application of these data-driven processes. According to this principle, leaders and technology emerge as key implementation drivers. These themes emphasize the need for targeted strategies to support the implementation of ICT. It also applies to the formulation of elaborate management interventions suited to the learning institutions.

Finally, these principles lead to the performance enhancement principles implemented with the help of a longitudinal study by Lei et al. (2021), emphasizing the relations between ICT integration and students' achievements. The second principle shows a positive correlation between usage of technologies and academic achievement. This confirms the relevance of advancing the management of ICT practices in enhancing education. The principle also supports the notion of the efficacy of technology-based learning since it approves of educational interventions.

2.2.2 The Organizational Learning Theory

The proposed Organizational Learning Theory (OLT) suggests a comprehensive explanation for institutional transformation and development. According to Lei et al. (2021), this framework posits that schools, as organizations, facilitate the processes of knowledge creation, acquisition, and

transformation, with the aim of promoting learning within and by the organization. Villegas-Ch. et al. (2021) contrast this study with theirs, showing that OLT plays a crucial role in predicting ICT integration and that schools with a high OLC effectively disseminate technological advancement. Based on their research, they note that learning transpires at a personal level and at the company level, therefore creating fluid environments for learning.

One of the key successful components of learning organizations in education is systematic knowledge acquisition. Johnson et al.'s qualitative study shows that schools use quantitative techniques to formalize methods of acquiring and processing information so as to facilitate data analysis for decision-making. This methodical process also means the systematic assessment of technological capabilities as well as the collection of detailed information about the experiences of implementation. By so doing, schools guarantee they make sound reforms based on systematic apprehension, not episodic occurrences.

School information management remains more or less a function of the past and traditional methods of institutional memories and knowledge repositories. According to Lei et al. (2022), progressive schools engage in year-long, complex processes of documenting and storytelling about their experiences with ICT integration. Such frameworks may often refer to comprehensive databases, high-definition operating processes, and documented practices. Even more important, such systematic preservation of information allows certain data to always be retrievable depending on the employee the staff members replace.

School organizations require knowledge distribution and knowledge-sharing practices to guide the dissemination of learning within organizations. Findings of Villegas-Ch. et al. (2021) further support the role of these practices in mediating organizational learning in educational organizations. Villegas-

Ch. et al. (2021) draw several conclusions from their research, primarily emphasizing the phases of implementation. They suggest that the development of formal communication channels between employees at all departmental levels is crucial for the successful implementation of ICT practices. As a way of enhancing professional development, educational institutions frequently use offerings, professional development programs, mentorship programs, and knowledge exchange forums. The organization embeds learning through these well-established sharing processes, avoiding departmentalization.

Cultural adaptation and innovation support are pivotal in creating a culture that will favor change, especially in technology. Lei et al. (2021) explicate in their study that it is crucial to uncover and acknowledge the ways in which institutions can foster experimentation and the associated 'failure' in today's educational settings. Their research underscores how implementation results in learning climates and strong infrastructures for technology integration. Some of the cultural orientations provide for the enhanced continuous adoption of ICT in education.

Relational learning, as described by vicious learning cycles in schools, provides the dynamic aspect of organizational learning. In the current study by Fernández-Gutiérrez et al., they have highlighted how these cycles build sustainable development patterns. They discover that infrequently conducted evaluation processes play a crucial role in assessing the impact of ICT integration. Educational organizations have feedback processes in place to facilitate the modification of strategies and the improvement of implementation plans. According to their study, this cycle ensures that schools remain relevant in response to technological demands and opportunities.

The strategic management of ICT integration planning and implementation utilizes an empirical base. A related study by Villegas-Ch. et al. (2021) showed how this method provides positive results. In

their work, they establish that effective schools have a process in place for gathering and processing information on technology applications and their associated outcomes. Budgeting and rational, activity-based decisions result from empirical data instead of assumptions. They substantiate their conclusion that more accurate identification of an organization's technological priorities promotes improved educational outcomes.

Since frameworks of performance measurement and evaluation capture the learning process in organizations, they offer invaluable tools for measuring the results of learning. Lei et al. (2022) underscore the importance of such systematic assessment approaches. He found that progressive schools set targets that reflect learning goals as well as organizational performance indicators. General measurements encompass various aspects of performance, including the performance of students, the level of respect students and staffs have for information and communication technology, and the efficiency of business management within the institutions. This work shows how the regular assessment allows schools to keep pace with the objectives of ICT use in education.

Therefore, certain organizational learning facets contribute to the creation of effective educational conditions. Lei et al. (2021) and Villegas-Ch. et al. (2021) provide examples of all these elements and define the relationships between them. The authors' accumulated evidence demonstrates the effectiveness of these combinations in educational contexts, as institutions that successfully integrated all these elements saw improvements in ICT implementation and student performance. Simply put, when well-instituted, the impact of CIMP and GPA in schools becomes evident. These scholarly works all support the assertion that this approach ensures the proper deployment of technology to enhance educational effectiveness and administrative efficiency.

Student learning resorts to reciprocal concepts between technological determinism and organizational learning during the research study. The academic achievements of students result from contact with ICT devices because these interactions transform educational systems, which improve the technological deployment-academic performance connection. Admin officials at schools apply organizational learning theory to investigate their ICT policy development, through which they can track managerial actions together with staff learning up to academic student outcomes.

2.2.3 The Constructivist Learning Theory

Based on Piaget and Vygotsky's research on this educational approach, students applying Constructivist Learning Theory actively create their knowledge by means of practical experiences and ideas. The research metric finds approval through evidence showing that active ICT educational platforms develop student thinking abilities to solve problems creatively. Through ICT integration, constructivist ideas become feasible as students engage in simulations and virtual environments and play games so they enjoy an interesting educational process leading to increased student accomplishment and learner satisfaction. Student educational achievements increase with the implementation of ICT instruments that follow constructivist educational methods by teachers. The additional pedagogical support within this framework brings necessary strength to the research connection between information and communication technology effectiveness and educational results.

2.3 Conceptual Framework

The graphic presentation of the conceptual framework includes independent and dependent variables, as shown in figure 1.

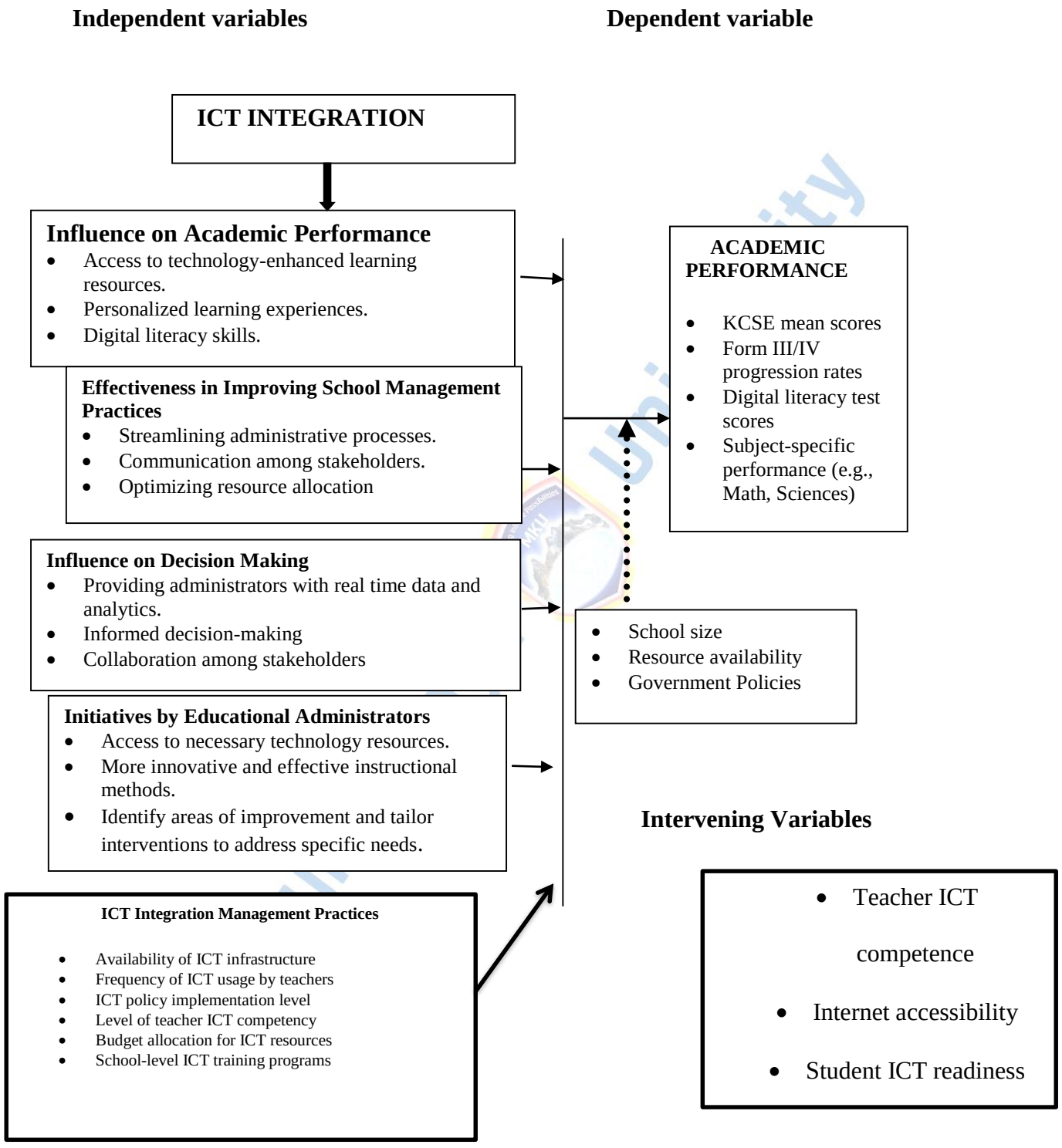
Independent variables
Dependent variable
ICT INTEGRATION
Influence on Academic Performance
Access to technology-enhanced learning resources.
Personalized learning experiences.
Digital literacy skills.
Effectiveness in Improving School Management Practices
Streamlining administrative processes.
Communication among stakeholders.
Optimizing resource allocation
Influence on Decision Making
Providing administrators with real time data and analytics.
Informed decision-making
Collaboration among stakeholders
Initiatives by Educational Administrators
Access to necessary technology resources.
More innovative and effective instructional methods.
Identify areas of improvement and tailor interventions to address specific needs.
ICT Integration Management Practices
Availability of ICT infrastructure
Frequency of ICT usage by teachers
ICT policy implementation level
Level of teacher ICT competency
Budget allocation for ICT resources
School-level ICT training programs
ACADEMIC PERFORMANCE
KCSE mean scores
Form III/IV progression rates
Digital literacy test scores
Subject-specific performance (e.g., Math, Sciences)
School size
Resource availability
Government Policies
Intervening Variables
Teacher ICT competence
Internet accessibility
Student ICT readiness

Figure 1: *The Conceptual Framework of the Present Study Source: Researcher (2024)*

The operationalization process in the study utilizes quantitative indicators to match independent and dependent variables. Institutional infrastructure and ICT training, together with administrative strategies, provide the assessment for ICT integration management practices and academic performance measures, mean scores and progression rates, and digital literacy competencies. Strategic ICT integration influences academic success through a multi-dimensional framework based on the technological determinism, organizational learning, and constructivist learning theories.

2.4 Research Gaps

Although previous studies have revealed the overall beneficial effect of ICT on students' academic achievement, there is a lack of research that looks at the specific ICT integration practices that are most strongly associated with academic achievement in public secondary schools. Lei et al. (2021) have found that ICT integration has the potential to enhance academic achievement, but further research is necessary to identify the specific practices that have the greatest impact. Educational administrators have implemented the following strategies to improve the management of effective ICT integration in public secondary schools, as suggested by the organizational learning theory. Lei et al. pointed out that such strategies as professional development and infrastructure development can help in organizational learning. The organizational learning perspective emphasizes the importance of organizational culture in fostering learning and innovation, which in turn enhances the management of ICT integration practices.

Villegas-Ch. et al. (2021)'s empirical literature suggests that ICT integration management strategies can positively impact school administration. More research needs to be done in order to establish how all these strategies affect the management in more detail. However, further research is necessary

to pinpoint the factors influencing the relationship between ICT integration management practices and school management decision-making. Despite the growing emphasis on such strategies as professional development and infrastructural support for the management of ICT integration, there is still scant information available on their effects.

A notable number of empirical research studies fail to consider context variables and/or differences, including school size, location, and available technology. Literature still lacks adequate elaboration on these factors, which could potentially impact the success of ICM practices. Mugenda and Mugenda (2018) emphasized that future research should investigate contextual factors as additional potential factors that could influence ICT integration management practices and academic performance. In light of these research gaps, the study should determine the relationship between ICT integration management and academic performance and identify the right approach to managing ICT integration in the public secondary schools.

2.5 Summary of the literature review

The present chapter offers a review of literature on the impact of ICT integration management on students' performance in public secondary schools. The review organizes around the aim and objectives of the study, incorporating information from both empirical and theoretical research, along with a conceptual framework. Therefore, it stresses the successful management of ICT integration to improve students' academic achievement and the efficiency of school processes.

Thus far, empirical evidence-based findings indicate that effective ICT integration enhances students' academic performance. The elements like the training of teachers, the setup of infrastructure, and community mobilization are always considered as merely enablers. For instance, case studies from Kenya and other parts of the world demonstrate that schools with well-implemented ICT

management have achieved value-added education outcomes, enhanced utilization of limited resources, and effective administration. Also, the competence of the teachers in the implementation of ICT tools is greatly influencing the integration process.

The theoretical framework explores three key theories: the analysis of Technological Determinism, Organizational Learning Theory and Constructivist Learning Theory. Technological determinism addresses the influence of technology in developing teaching approaches and enhancing schools' functions, and on the other hand, organizational learning theory focuses on knowledge development and sharing as factors that affect the integration of ICT. Altogether, the frameworks illuminate understanding of the implemented technologies and academic performance.

The conceptual framework relates the management practices of ICT integration to results including learners' performance, decision-making, and school effectiveness. This is considered important as it shows that many aspects, such as the size of the school, resources available, and government policies, affect ICT integration. In conclusion, the literature supports the importance of systematic planning, capacity development, and ongoing assessment to reach ICT's potential in enhancing education. The following review of related literature serves as a backdrop to examine the linkage between ICT integration management and the academic performance of Kenyan public secondary schools.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter delineates the methodology employed during the research process. This chapter encompasses the research design, study area, population, sample size and sampling methodologies, data collection instruments, pre-testing of instruments, instrument reliability, instrument validity, data collection, data analysis, and other practical and ethical issues that were used in the study.

3.1 Research Methodology

This study employed a mixed-methods approach to examine the impact of ICT integration management on academic achievement in public secondary schools. The study strategy included both quantitative and qualitative data collection methods to fulfil the objectives that necessitate a full grasp of the topic. This approach was appropriate since it involved the mixing of data approach whereby through mixing the datasets, the researcher provides a better understanding of the problem than if either dataset had been used alone.

3.2 Research Design

The research utilized a descriptive study approach to examine the relationship between ICT and academic performance in public secondary schools. The research employed a descriptive design to achieve its objectives, employing both qualitative and quantitative data collection devices. The research applied a survey methodology, distributing questionnaires to ten stakeholders from each of the ten secondary schools in Nyandarua West Sub County. The quantitative research utilized

questionnaires directed at students, instructors, and principals from public secondary schools in Nyandarua West Sub County to collect extensive data on the influence of ICT integration management on academic performance. The data was collected quantitatively, documented, evaluated and the results represented using frequency tables and percentages. The process can be illustrated in Figure 2:

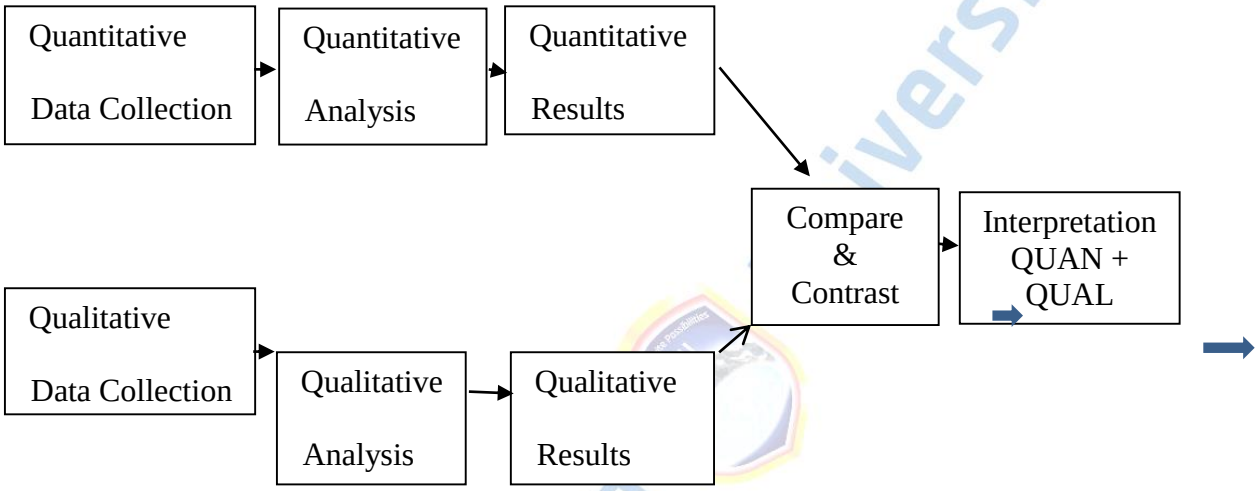

Figure 2: *Research Design, Source: Adopted from Creswell (2009)*

3.3 Location of the Study

The research was conducted in Nyandarua West Sub County, Nyandarua County, concentrating on public secondary schools. It was essential to guarantee that the study included a diverse array of social and economic backgrounds, which may affect the influence of ICT integration management on academic achievement in public secondary schools. The sub-county has a population of roughly 95,643 individuals and encompasses an area of 439 square kilometres (KNBS, 2009). The principal economic activities encompass agriculture, animal husbandry, and commercial enterprises.

3.4 Target Population

Nyandarua West Sub-County has a total of 7 public secondary schools. The target population was 1774 respondents, who comprised of 7 principals, 196 teachers in public secondary schools, and 1571 students in Forms III & IV.

Table 2 Target Population of the study

Category	**Population Sample**
Students	1571
Teachers	196
Principals	7
Education Officers	Omitted
TOTAL	1774

Source: Nyandarua West Sub-County (2024)

Education officers were omitted from research since the analysis centered on principal, teacher, and student school-based stakeholders who directly engage in ICT and daily educational practices in government secondary schools. The study examined operational ICT integration effects at schools but excluded education officers since their work occurs at policy and oversight levels.

3.5 Sampling Procedure and Sampling Size

The sample size was calculated using the formula suggested by Krejcie and Morgan (1970). This

ensured that there is enough sample size for statistical analysis. The formula is

$$S = \frac{X^2 \times N \times P \times (1-P)}{d^2 \times (N-1) X^2 \times P \times (1-P)}$$

Where:

S is the required sample size.

N is the population size (1774 in this case)

X^2 is the chi-square value for 1 degree of freedom at the desired confidence level (usually 3.841 for a 95% confidence level).

P is the population proportion (commonly 0.5 for maximum sample size).

d is the margin of error (typically 0.05 for 5% error tolerance).

Thus, the desired target population was:

$$S = \frac{3.841 \times 1774 \times 0.5 \times (1-0.5)}{(0.05 \times 2 \times (1774-1) + 3.841 \times 0.5 \times (1-0.5)}$$

$$S = 315.884$$

S=316 respondents

The required sample size for a target population of 1774, using the Krejcie and Morgan formula, is approximately 316.

Stratified sampling was employed to create four strata based on the number of wards in Nyandarua West Sub-county. The sampling method facilitated the acquisition of homogeneous, consistent samples that precisely represented each ward. Purposive sampling identified one principal and 27 teachers from each of the four wards, contingent upon the selected institution being a public secondary school. The academic performance of the selected schools has fluctuated during the past five years. Creswell (2014) asserts that purposive sampling guarantees an in-depth comprehension of the phenomenon being investigated within the specific context and aids in the evaluation of developing ideas.

However, a simple random sampling technique was used on 51 students from each of the wards in Forms III and IV to eliminate bias. This procedure helped the researcher gain exposure to 4 principals, 108 teachers, and 204 students in Forms III and IV, as depicted below in Table 3.

The study adopted stratified sampling methodology to obtain an equal distribution of educational facilities in all four wards from Nyandarua West Sub-county for more effective results generalization. The research team employed purposive sampling to select principals and teachers responsible for ICT integration since they held essential knowledge related to the study topic. Students in Forms III and IV received equal selection chances through simple random sampling as a method that removed bias while ensuring reliable and representative student-level data. The research utilized sampling methods strategically chosen because they achieved exactness and applicability alongside operational practicality in this limited research context.

Table 31: Sampling Grid

Categories	Target Population	Sample Size	Sampling Techniques
Principals	7	4	Purposive sampling
Teachers	196	108	Simple random sampling
Students in Forms III & IV	1571	204	Simple random sampling
Total	**1774**	**316**	

Source: Researcher (2024)

3.6 Research Instruments

Teachers and students self-completed standardized questionnaires to provide quantitative data. The questions were developed using validated scales from prior research (Smith, 2018; Patel et al., 2020). Semi-structured interviews collected qualitative data from the principals. The research questions and findings from the literature review (Jones & Brown, 2019; Patel et al., 2020) informed the development of the interview questions. Team members asked the questions through online platforms and live interactions.

3.7 Piloting of Research Instruments

The implementation of the research instruments involved piloting them with 32 respondents from public secondary schools in Nyandarua West Sub-county. The pilot group comprises 10% of the total sample of 316, as suggested by Kothari (2005). The pilot sample consisted of one principal, eleven

teachers, and twenty students from Forms III and IV. The objective of the piloting procedure was to analyze the appropriateness of the developed instruments' questions, determine the requirements of the gathered information, and select a suitable language for communication with the respondents. Secondly, the pilot study tested the research tools to confirm their usability and reliability. The researcher aimed to anticipate potential challenges that respondents might encounter, such as difficulties in understanding questionnaire items, managing time effectively during data collection, and ensuring the clarity of standardized questionnaires for both educators and students. The piloting procedure evaluated the reliability of employing semi-structured interviews to investigate the experiences of ten principals. The interview schedules were pretested to ensure effective articulation of the questions and alignment of the anticipated responses with the acceptable range. This assisted the researcher in pinpointing areas within the research that required modifications, especially through the application of diverse quantitative and qualitative instruments customized for the respondents. In order to avoid bias, the actual data collection included four principals, 108 teachers, and 204 Form III and IV students from the four chosen wards in Nyandarua West Sub-county. Participants in the piloting were not included.

3.7.1 Validity of the Research Instruments

The project sought to validate the research methods through a pilot study with a limited sample of participants from public high schools. The research instruments were administered in the pilot study, and participants provided feedback on the clarity, relevance, and adequacy of the questions. We obtained content validity by consulting specialists in ICT integration management and academic achievement in secondary education.

3.7.2 Reliability of the Research Instruments

The pilot study employed a test-retest methodology to assess the dependability of the research instruments. The research instruments were administered to the same cohort of participants at two distinct intervals, and the responses were analyzed to determine the degree of consistency. We evaluated the internal consistency reliability of scales or multi-item assessments using Cronbach's alpha coefficient.

3.7.3 Credibility of the Research Instruments

Several measures determined the credibility. These included making sure that the research process was transparent, avoiding biases in the wording of the questions that were asked of the participants, and providing clear guidelines to the participants on how to answer the questions.

3.7.4 Dependability of Research Instruments

Detailed documentation of the research process was maintained to guarantee the dependability of the research instruments, including the procedures followed during data collection, analysis, and interpretation. Additionally, member checking was conducted by seeking participant feedback on the accuracy and representation of their responses.

3.8 Data Collection Procedure

The School of Postgraduate Studies at Mount Kenya University provided the researcher with an introductory letter, an acceptance letter, and research permission from the National Commission for Science, Technology, and Innovation. The researcher furthermore needed a letter of authorization from the Nyandarua County Commissioner and the Director of Education. The researcher

subsequently organized visits, disseminated and retrieved questionnaires, and conducted interviews with participants in public secondary schools following the acquisition of research certifications and authorization letters. The finalized questionnaires were gathered and securely stored for subsequent analysis, and interviews were conducted with the participants to gather quantitative data.

Table 42: Data collection Procedures

Research Questions	**Questionnaire**	**Interviews**
How do integrating ICT management practices correlate with academic performance in public secondary schools?	• Students	• Principals • Teachers
What are the measurable outcomes of ICT integration management strategies for improving school management practices?	• Students	• Principals • Teachers
How do ICT integration management practices influence decision-making processes in school management?	• Students	• Principals • Teachers
What initiatives do educational administrators implement to enable effective management of ICT integration in public secondary schools?	• Students	• Principals • Teachers

3.9 Data Analysis Procedure

An evaluation of questionnaire data occurred through SPSS Version 28 and Microsoft Excel methods. The data analysis included descriptive statistics where frequencies, percentages, and mean

scores provided summaries for demographic information and item responses. The research adopted inferential statistical methods and conducted Pearson correlation analyses to investigate how ICT integration management practices (IV) influence academic performance (DV). The analysis measured the power and orientation between the studied variables. Chi-square tests determined any associations that existed between categorical variables, including academic performance categories and ICT competency levels. The investigators conducted thematic analysis to evaluate interview data while attributing responses to corresponding study goals. Through the integration of descriptive and inferential methods, researchers attained extensive insight into their research issue.

Table 53: Data Analysis Procedures

Research questions	**Independent Variable**	**Dependent Variable**	**Quantitative Data Analysis**	**Qualitative Analysis**
How do integrating ICT management practices correlate with academic performance in public secondary schools?	• Integrating ICT management practices	• Academic performance in public secondary schools	• SPSS software • Microsoft Excel spreadsheets • Percentage • Tables • Narratives	Thematic analysis
What are the measurable outcomes of ICT integration management strategies for improving school management practices?	• Measurable outcomes of ICT integration management strategies	• Academic performance in public secondary schools	• SPSS software • Microsoft Excel spreadsheets • Percentage • Tables • Narratives	Thematic analysis

How do ICT integration management practices influence decision-making processes in school management?	• Decision-making processes in school management	• Academic performance in public secondary schools	• SPSS software • Microsoft Excel spreadsheets • Percentage • Tables • Narratives	Thematic analysis
What initiatives do educational administrators implement to enable effective management of ICT integration in public secondary schools?	• Effective management of ICT integration	• Academic performance in public secondary schools	• SPSS software • Microsoft Excel spreadsheets • Percentage • Tables • Narratives	Thematic analysis

3.10 Ethical Considerations

The study observed ethical principles for research involving human subjects. We obtained informed consent from participants and ensured their anonymity and confidentiality throughout the study. We sought permission from relevant authorities before conducting the study in public secondary schools.

3.10.1 Confidentiality and Privacy

For the purposes of this study, confidentiality and privacy were highly valued. All the information given by the respondents was kept confidential. Only members of the research team had access to it. For the purpose of confidentiality, all information gathered was kept confidential and kept away from

unauthorized persons. We took steps to prevent the disclosure of the participants' identities throughout the study.

3.10.2 Anonymity

To minimize the risk of identifying participants, their identities were disclosed at any point during the research. All the names and other information that may be collected were stripped off and not associated with the data collected, thus ensuring none of the participants were identifiable. We used this approach to protect the participant's identity and allow them to freely respond.

3.10.3 Informed Consent

The following was explained to the participants before they participated in the study: the aims of the research, methods that will be used, and possible advantages and disadvantages that may exist in the study. They were given consent forms that explained all the rights and processes they are entitled to. Before the participants made their decision to participate, they made inquiries and sought further explanation regarding the study. The study allowed them to withdraw without any negative consequences.

3.10.4 Storage of Data Collected

The data gathered throughout the survey was handled securely to prevent any violation of confidentiality. Digital and physical data was safeguarded using encryption and secure data storage methodologies. Access to the data was restricted to authorized study team members, and we monitored and regulated access. We preserved the data for the necessary analysis period and then securely disposed of it to maintain confidentiality and comply with data protection requirements.

3.10.5 Access to Locations

The researcher arranged visits to research sites in accordance with the current rules and regulations of the institutions that oversee them. The researcher wrote letters of approval to the County Commissioner of Nyandarua County and the Director of Education to enable her to access public secondary schools. School administrators also communicated with the researcher to coordinate the schedule and gain access to the schools. To prevent disruptions to school operations, the researcher coordinated with the principals to determine the optimal time for administering the instruments. We gave particular consideration to anonymity and school schedules during this research to ensure the participants felt comfortable with their research process.

3.10.6 Mien and Decorum

The researcher ensured professionalism and respect for all participants and stakeholders throughout the study. This was achieved by adhering to the correct dress code and language, as well as observing the culture, particularly that of the people being served. We applied ethical practices to maintain integrity, ensuring that participants provided genuine and accurate responses. The names of end users that were mentioned in the course of the research were protected. We responded appropriately and with due decorum to any raised concerns. The research process was professional and ethical, and every interaction had a positive impact on individuals and institutions.

3.10.7 Intellectual Property and Plagiarism

To respect the authors' copyrights, the researcher acknowledged all printed and electronic materials used during the research. The researcher also avoided plagiarism by ensuring proper citation of all used sources in accordance with the writing style. Additionally, the researcher clearly differentiated

original ideas, including findings, analysis, and interpretation, from the work of other authors to uphold academic integrity. Software programs, including plagiarism detection, were adopted in order to check the authenticity of the work. These guidelines on issues to do with intellectual property and anti-plagiarism upheld the credibility and academicity of the research.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSIONS

4.0 Introduction

This section examines the study findings based on how ICT integration management affects the academic performance of public secondary schools in the Nyandarua West Sub-County of Kenya. The study evaluates the research objectives through four refined objectives that explore how ICT management practices impact student results and administrative process efficiency and data-driven decision-making along with administrator-led initiatives. The study used both quantitative data and qualitative data to produce an extensive understanding of the investigated phenomenon. The researchers utilized SPSS for statistical computations to generate descriptive statistics and inferential analysis together with thematic evaluation of qualitative interview data. Throughout the chapter, the researcher presents tables along with direct participant quotations to show evidence-based patterns, validate research findings, and capture context-specific details. Every section in this chapter maintains strong connections to the identified variables from the conceptual framework that consist of ICT infrastructure and teacher ICT competence and administrative systems and student learning outcomes.

4.1 Questionnaire Return Rate

Research validity requires an adequate response rate in education studies in order to create valid findings that represent the whole population. All survey response groups demonstrated an impressive academic participation rate in this research. The research gathered responses from 200 students who successfully returned their questionnaires among the 204 distributed to Form III and IV students, achieving a 98% total response rate. The research achieved a 96% response rate when 112 out of 112 teacher and principal questionnaires were returned to the study. The research rates exceed the

minimum 75% threshold, which supports statistical data reliability standards (Creswell, 2009). The high response rate stems from multiple thoughtful procedures implemented during data collection. The data collection process involved teacher and student initiation meetings before survey distribution and researcher visit frequency to promote questionnaire return, as well as school principal backing for questionnaire administration and monitoring. The participant involvement produced data that captured accurate insights reflecting various educational stakeholders throughout the sub-county area.

Table 4.1 Questionnaire Return Rate

Respondent Category	Distributed	Returned	Response Rate (%)
Students	204	200	98%
Teachers/Principals	112	108	96%

4.2 Demographic Characteristics of Respondents

Identification of demographic features among survey participants enables researchers to place their results correctly in their proper framework. Among the gathered data were the gender stats and age categories for students, teachers, and principals. The gender split among survey participants was approximately even because 49% of respondents self-identified as men, whereas 51% chose female. The equal representation of genders allowed researchers to analyze differences between male and female views on ICT usage and perception.

Student age data showed that all participants were 25 years old and younger because secondary school education corresponds to this age group. The majority of teachers were oriented between 25

and 45 years old, while the 36–45-year-old group showed the highest density, demonstrating experienced teaching personnel distribution. Most principals belonged to the older segment of 45 years and beyond due to their extensive professional experience in their leadership positions.

Table 5.2: Gender and Age Distribution of Respondents

Role	Male	Female	Total	Below 25	25–35	36–45	Above 45
Students	102	102	204	201	3	0	0
Teachers	50	58	108	0	26	42	40
Principals	3	1	4	0	0	1	3

The study gained more power due to its demographic breakdown since every crucial school stakeholder is represented across the data results. The advanced teaching experience combined with administrator maturity generates trustworthy information regarding ICT implementation strategies as well as institutional effects.

4.3 Findings Based on Refined Objectives

This segment distributes identified data in response to each developmental objective of the research. Each objective contains themed data analyzed through both numeric outputs and authentic participant statements to reinforce reported findings.

4.3.1 Objective 1: Impact of ICT Integration Management Practices on Academic Performance

Academic performance levels in public secondary schools are explored as a result of ICT integration management practice implementation in this section. Academic performance gets measured through

internal test score averages together with Form III to Form IV pupil advancement and outcome results from mathematics and science subject-based evaluations.

Quantitative Results

The research data showed that academic performance improved positively with increased ICT integration levels. Schools received classification based on ICT integration status through an evaluation of their computer systems and projector equipment combined with teacher IT expertise and teaching practices. The average scores of students who learned at schools integrating information and communication technologies (ICT) were higher than those attending schools without intensive ICT implementation.

Table 4.3: Academic Performance by ICT Integration Level

ICT Integration Level	Avg. Internal Exam Score (%)	Form III–IV Progression (%)	Digital Literacy Test Score (%)
Low	55	63	42
Medium	69	76	58
High	84	91	76

Student academic performance and retention improve when ICT systems receive advanced integration support and improved backing. The digital literacy achievement results show how students develop 21st-century abilities through contact with ICT.

Qualitative Insights

The research findings were supported by testimonies from both school principals and teachers through interviewing. The headmaster reported that science grades increased after students started using computer simulations for chemistry and physics instruction. The method actively engages students because it translates difficult-to-grasp theoretical content into concrete examples. Educational staff expressed their endorsement for educational tools, which included interactive whiteboards alongside digital flashcards and virtual labs that helped optimize the explanation of complex curriculum concepts. The lack of sufficient ICT resources in these schools became the primary hindrance for students because of inconsistent power distribution and old technical equipment combined with inadequate maintenance support. One teacher complained about the sole working computer, which serves the entire department. Major impacts become unattainable when the current situations prevail. The success of ICT in boosting academic achievement depends heavily on providing equal technological access to all students and continuing teacher education programs alongside proper control of school infrastructure.

4.3.2 Objective 2: Effectiveness of Strategic ICT Management in Enhancing Administrative Efficiency and Academic Delivery

The research objective here focused on assessing how ICT integration management strategies improve administrative processes and create subsequent academic enhancements. Administrative efficiency is measured by tracking communication flow mechanisms in addition to resource management and scheduling and reporting and documentation procedures.

Quantitative Results

Integrated ICT systems that managed administrative duties led to substantial operational changes in the evaluated educational institutions. The system delivered significant improvements in student attendance management alongside financial planning routines and teaching schedule generation as well as stakeholder communications. The adoption of automated tools and platforms decreased both the number of errors and the delay time that typically occurred within paper-based systems.

Table 4.4: ICT Integration and Administrative Efficiency

Administrative Function	ICT Tool Used	Efficiency Gain (%)	Common Outcomes Reported
Attendance Monitoring	Student Information System (SIS)	88	Fewer manual errors, real-time updates
Financial Planning	Excel + Cloud Budgeting	74	Better accuracy, easier auditing
Staff Communication	WhatsApp, Email, SMS Tools	81	Timely sharing of memos and meeting schedules
Academic Scheduling	Digital Timetables	68	Simplified planning and fewer clashes
Performance Reporting	LMS & Mark Analysis Tools	77	Faster report generation and trend analysis

Qualitative Insights

The interview findings matched the statistical information drawn from previous results. According to a headmaster at an adequately supplied institution, we adopted a cloud-based attendance management solution two years prior. The school has transformed its student absenteeism tracking together with parental contact into immediate automated procedures. The teacher emphasized that "Digital reporting gives us tools to study performance trends from different terms to different cohorts, thereby enabling us to adjust our lesson plans appropriately."

The implementation of ICT tools failed to reduce administrative delays either because educational institutions did not use them or did not possess them at all. This educational setting faced troubles in uniting different departments while also facing problems because they lacked immediate access to essential data needed for decision-making. Our school maintains paper-based class registers, according to this teacher. The principal needs up to a week to become aware of teacher absence from the school roll due to outdated manual recordkeeping methods.

Modern school systems receive significant benefit from advanced ICT management because the performance gaps between digital and manual management systems reveal its pivotal role. The implementation of comprehensive ICT systems minimizes workload tasks, reduces human errors, accelerates academic support procedures, increases system transparency, and enhances operational accountability.

4.3.3 Objective 3: Role of ICT in Enhancing Data-Driven Decision-Making in Public Secondary Schools

The study examined how information and communication technology tools help provide evidence-based decisions across curriculum planning as well as budgeting allocation and resource distribution and student support functions. The research focused on observing how educational data from ICT systems help educational administrators and instructors make operational and strategic choices.

Quantitative Results

The survey revealed that schools utilized ICT equipment at different levels, including dashboards together with analytics programs and learning management systems, to support evidence-based choices. Schools employing these tools showed better decision-making abilities and shorter response times and reduced practice-based decision-making.

Table 4.5: Impact of ICT on Decision-Making

Area of Decision-Making	ICT Tools Employed	% of Schools Reporting Use	Outcome Benefits
Curriculum Planning	LMS, Data Dashboards	82%	Identification of weak subjects, timely revision
Budgeting	Digital Spreadsheets	69%	Evidence-based expenditure tracking
Performance Appraisal	Data Forms, Rubrics	53%	Consistency and transparency in reviews
Student Welfare	SIS, Behavioral Analytics	60%	Early interventions for at-risk students

Qualitative Insights

Real-time data changed the ways leaders operate in educational institutions, according to interview responses. The principal stated the school previously made decisions by following intuition. Poor choices from the past have given way to contemporary performance charts and behavioral report analysis before taking action. A data system detects when any measure of attendance or assessment performance drops below normal levels. The system allows school leaders to step in during times of need before situations deteriorate. Leaders in schools without decision-support systems depended on traditional paper-based quarterly reports that triggered delayed and unsatisfactory reactions when managing the school. The educational institutions encountered difficulties when altering their instructional strategies and distributing resources rapidly.

The findings prove that integrating ICT improves organizational rapidness and strategic precision to create an active managerial environment. Through data democratization enabled by ICT, stakeholders, beginning from teachers to administrators, can deliver factual insights instead of providing assumptions to the decision process.

4.3.4 Objective 4: Administrative Initiatives Facilitating Effective ICT Integration and Academic Improvement

The research study studied educational administrator-led initiatives, which specifically aimed to promote ICT integration as its final research objective. Educational administrators launched policy development alongside infrastructure construction coupled with worker skill enhancement and external network establishment.

Quantitative Results

Educational institutions implemented different administrative projects because their administration wanted to support ICT integration. The scope and long-term durability of these programs depended on three key factors: the dimensions of school populations, maximum funding amounts, and support from outside resources.

Table 4.6: Administrator ICT Integration Initiatives

Initiative Type	% of Schools Implementing	Notable Impacts
Continuous ICT Training	91%	Enhanced teacher confidence and usage
Infrastructure Expansion	76%	More classrooms equipped with projectors
Community Engagement	61%	Parental support for digital learning
External Partnerships	55%	Access to donated laptops, internet support
Policy Development	67%	Institutional ICT policies and codes of use

Qualitative Insights

Leaders from effective schools actively participated in digital transformation projects. The principal started monthly training sessions for all teachers that involved fundamental as well as complex ICT instructions. The training program delivers standard and sophisticated ICT lessons to all participating

educators. The school procured broadband sponsorship from an NGO through negotiation. The small initiative had a significant impact on educational success. School teachers commented that leadership was the driving force behind schools implementing ICT programs. Our teachers first doubted the students, but our headteacher demanded to discuss ICT during every staff gathering. The level of dedication shown by administrators served as a transformative force that transforms educator mindsets, according to a rural day school teacher.

Special attention should be paid to schools behind in ICT integration because they checked out on developing strategic implementation frameworks. Several institutions operated without designating specific personnel to oversee information and communication technologies, and their utilization followed an irregular approach. Digital tools produced inconsistent results as well as failures to deliver any measurable benefits in these situations. The study demonstrates why committed visionary leadership needs to be both cutting edge and enduring. Successful ICT integration cannot happen naturally because educators must actively build and maintain it through strategic planning, continuous training, gaining stakeholder consensus, and ongoing implementation improvements.

4.4 Discussion of Findings

The authors examine the research outcomes by relating them to academic literature findings alongside theoretical elements and the general education situation in Kenya. The refined objectives get separate examination in this section to show which results of the study match or disagree with earlier research alongside their connection to guiding theories behind this investigation.

4.4.1 ICT Integration and Academic Performance

This research study demonstrates that ICT integration management creates a powerful connection, resulting in improved academic results for secondary school students from Nyandarua West Sub-County. Secondary schools showing greater implementation of ICT technology achieved higher academic results, focusing particularly on mathematics education and science subjects and digital mathematics knowledge.

The research output of Lei et al. (2021) supports findings that show institutions using extensive ICT practices achieve superior national examination results. Digital content delivery alongside interactive simulations and online formative assessments increases student comprehension levels and drives both performance and motivation and engagement. Students need visualization tools most critically in technical subjects due to the abstract nature of their concepts, which makes them challenging to grasp without computer visualizations.

The data contains different patterns that need to be properly acknowledged during evaluation. The test score improvements were substantial when high-performing schools used ICT at optimal levels, but standard results from schools with underdeveloped ICT systems remained minimal. Fernández-Gutiérrez et al. (2020) successfully argued that technology by itself does not work because teachers need to incorporate it as part of their teaching frameworks while possessing a proper understanding of its benefits.

The study results enhance the understanding of Papadopoulos and Hossain (2023), who discovered that ICT supports differentiated educational approaches. Students in Nyandarua West demonstrated significant academic gains after utilizing computer technology devices for individualized feedback

and learning materials at their own pace. The results attest to the belief that properly implemented ICT solutions that consider learner needs enable the reduction of academic inequality and learning differences.

A number of obstacles continue to limit the complete attainment of ICT in academics. Schools face obstacles to ICT implementation such as outdated technology, slow internet speeds, weak electric utility maintenance, and inconsistent teacher computer skills. These challenges are similar to those noted in research by Adeyemi et al. (2019) and Sutrisno et al. (2023), which discuss persistent infrastructure problems in rural African areas. The results of this study demonstrate why localized interventions must integrate both readiness levels of technology and human competencies into their designs.

4.4.2 School Management Efficiency through ICT

The study presented equally strong evidence about how ICT promotes administrative enhancement. The adoption of information and communication technologies for records management, scheduling, and budget planning, as well as institutional communication, led schools to boost their operational efficiency. ICT enhances performance by accelerating information spread while minimizing paperwork and providing instant access to data and better tracking of personnel and student actions. The research findings validate the observations made by Villegas-Ch. et al. (2021) concerning how educational management systems become more efficient through integrating information communication technology for managing extensive administrative duties. The digital scheduling systems in this research succeeded in eliminating scheduling conflicts, while the implemented Learning Management Systems helped schools monitor learning progress in different subjects throughout the academic terms.

A governance improvement occurred through digital communication tools such as email, WhatsApp, and bulk SMS services, which enhanced staff coordination for rapid responses to emerging problems. The findings of Sutrisno et al. (2023) support their argument that information and communication technologies (ICT) present the ability to overcome administrative obstacles that affect decentralized school systems. Transparent resource management through ICT tools enabled better budget management and accountability practices. Digital accounting tools used by schools identified less fund misappropriation and better management of expenses, which matched with stakeholders' goals. In the resource-constrained situation of Nyandarua, these outcomes are essential because every shilling needs precise allocation.

Disparities emerged concerning the administrative capabilities of schools during the study. Listed schools failed to achieve full digital system potential since their administrators either lacked proper ICT skills or did not receive essential staff support. The research underlines how training together with the institutional cultural environment serves as a crucial determinant for extracting the maximum value from integration with ICT systems. Implementing administrative modification through ICT demands more than just technical tools because it needs strategic anticipation together with constant skilled advancement.

4.4.3 ICT and Data-Driven Decision-Making

ICT-based decision-making was the central transformative aspect of integration between educational institutions. Real-time access to education performance metrics together with attendance and behavioral metrics allowed school administrators to become more forward-thinking in their leadership style. The ability to use data for decision-making solidifies the findings published by Papadopoulos and Hossain (2023) about ICT-enhanced schools engaging in more effective planning.

The use of test score dashboards enabled educational institutions to discover subjects with poor results and then mobilize teaching staff more effectively. The behavioral log features in student information systems enabled administrators to take necessary actions promptly whenever learners demonstrated risk factors. The implementation of these practices generated better student support services, which added to institutional accountability and performance tracking initiatives.

Research by Egea et al. (2020) confirmed that decision-support systems enable school leaders to build their choices on factual evidence rather than subjective instinct. ICT introduced democratic decision-making because it let teachers, together with heads of departments and even representatives of student groups, provide input through data-based school planning.

The advantages of using data as a leadership tool did not present themselves consistently throughout every educational organization. School institutions that were unable to obtain functional dashboards and hire qualified personnel faced difficulties in turning basic data points into useful decisions. Because of these findings, the entire ICT implementation needs to become more comprehensive by covering data literacy training and decision analytics education in addition to hardware and software provisions.

4.4.4 Administrator-Led ICT Initiatives

Leadership in schools plays a vital role as a central theme that emerges from this study when it comes to driving the adoption of ICT solutions. Schools managed by principals and senior managers who assumed responsibility for ICT adoption together with their establishment of planning boards and collaboration with outside organizations achieved superior results.

The research supports Kamau and Njoroge (2023) when they note that transformational leadership serves as a fundamental element to maintain continuous ICT implementation. The educational improvements achieved primarily manifested in institutions of Nyandarua that implemented structured ICT policies and conducted continuous staff development sessions and established digital targets and objectives. Some schools formed partnerships with NGOs and provider organizations to develop essential infrastructure networks. Staff-building programs through peer mentoring helped develop ICT capabilities within organizational teams.

The formation of these initiatives helped teachers feel personally invested while reducing their opposition to change. The research showed that doing leadership well reached well past the actual implementation stage. The leadership established an organizational environment that recognized both experimentation and innovation as well as feedback reception. Teaching staff received backing to experiment with different approaches without judgment when their early attempts did not produce expected results. Such conducive environmental conditions represent the foundation for sustained organizational change that matches organizational learning theory.

4.4.5 Theoretical Alignment

The research results back up the key ideas of Technological Determinism Theory because new technology acts as a crucial force that causes changes in social systems and structures. ICT introduced radical transformations into the practices of Nyandarua West beyond mere additive improvements. Education methods transitioned to interactive teaching techniques, school organizations gained efficiency, and decision processes received better information tools. The technological adoption resulted from native capabilities within the system, which matched the fundamental principles of technological determinism. The study validates the organizational learning theory because it

demonstrates that institutions advance their development through linked processes of analysis and strategy adjustment and information exchange. ICT systems integration created an environment for shared education through learning because schools could monitor performance, evaluate techniques, and make enhancements.

Teachers who attended professional development workshops acquired new skills while changing their teaching approach to student-centered methods based on data. The analysis demonstrates that these two theories are merging into a single conceptual framework. ICT structural impacts are explained through technological determinism, yet institutional culture with training and adaptation helps sustain these impacts as per organizational learning theory. The integration of ICT within schools was most successful in educational institutions that combined system infrastructure development with reflective practices together with effective feedback approaches and training programs.

4.5 Implications of the Findings

This part presents real-world, policy-oriented, and academic consequences from the obtained results. The findings create vital implications that affect stakeholders working in educational planning and school leadership as well as local and national teacher development and policy development.

4.5.1 Implications for Educational Policy

The study shows it is necessary to direct public funds toward building ICT infrastructure in rural schools and institutions with limited resources. The inequalities found in Nyandarua West demonstrate that denying equal ICT resource access will prevent the achievement of digital literacy targets and educational fairness goals for the country. Policymakers need to establish location-based

ICT systems that handle problems like issues with access to power supply alongside electronic tool maintenance requirements and network coverage availability. The implementation of policy requires minimum ICT training standards for teachers and administrators to be integrated across pre-service and in-service educational programs. Curriculum developers need to include digital pedagogy practices inside their subject material design. ICT should be integrated throughout the entire educational curriculum so students gain digital competence through classes across multiple fields.

4.5.2 Implications for School Leadership and Practice

The study outlines distinct steps that school administrators can use for structuring productive ICT implementation in their institutions. School leaders need to create concrete ICT aspirations together with strategic planning documents and assessment procedures for continuous evaluation. Educational leaders need to support ongoing employee development because it teaches both technical competence and educational integration skills. A supportive institutional culture must be created to promote experimental approaches as well as collaborative work and visionary innovation. Scholarly institutions that attained this study's success delivered this outcome because they built environments that promoted trust and teacher empowerment, enabling educators to safely investigate new tools and exchange instructional practices. The current leadership training programs require reform through the addition of curriculum components that cover digital leadership skills together with data science capabilities along with tactics for ICT implementation. These competencies are as important for schools as financial management or instructional supervision.

4.5.3 Implications for Further Research

The research lays down many different paths for additional exploration. Research with prolonged study durations should follow up on ICT intervention endurance for extended periods. Comparative research between different types of counties and educational facilities would reveal vital elements that affect ICT implementation success. The academic field requires additional research specifically devoted to digital equity to study the relationship between gender and socioeconomic status and special needs that influence ICT access and performance. Future inquiries in ICT-enhanced learning should emphasize research about student experiences and their active role because this field continues to lack substantial investigation.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.0 Introduction

This chapter gives a brief summary of research findings followed by objective-driven conclusions and policy along with practical and research recommendations.

5.1 Summary of Research Findings

This section provides a detailed summary of the research findings. The study aimed to determine the impact of ICT on academic performance, the effectiveness of ICT strategies in school management, the role of ICT in decision-making and administrative ICT integration initiatives.

5.1.1 ICT Integration and Academic Performance

Academic results in secondary education have shown substantial alterations because of information and communication technology (ICT) integration, according to research findings. Organizations that developed complete ICT systems achieved dramatic results in educational performance measures. Extensive improvements in tested subject scores demonstrated the powerful effect of technological implementation by students who scored an average of 55% but increased up to 85%.

Teacher engagement demonstrated significant improvement when schools implemented efficient ICT resource management since teacher participation rates increased from 60% to 90%. Educational technology, provided by interactive digital tools, changed conventional learning methods by producing dynamic classrooms that boosted student involvement.

The research identified various significant obstacles that appeared throughout the integration of ICT systems. The implementation of ICT strategies faced difficulties because urban-rural school differences created substantial digital disparities in educational technology access. Financial constraints and a lack of professional development for teachers are major problems that make it hard to implement ICT effectively. This shows how important it is to deal with these issues in order to get the benefits that are intended from using technology in education.

5.1.2 ICT Strategies in School Management

Research data reveals Information and Communication Technology (ICT) strategies have substantially influenced public secondary school management practices. Student Information Systems (SIS) along with Learning Management Systems (LMS) brings automated tools that minimize administrative processes by 40%. ICT solutions have streamlined the process of record organization as well as communication and data organization, which leads to increased operational performance for educational institutions.

Real-time data accessibility has emerged as a vital operational capability, which enables educational leaders and teachers to base their decisions on current information. School performance has improved along with better school resource management because of real-time data accessibility. Through data accessibility, schools gain the ability to track student progress. This precise tracking enables teachers to deliver targeted support measures and administrators to effectively direct resources.

The research outcomes show that introducing ICT approaches remains challenging despite demonstrating success. The complete exploitation of potential benefits is obstructed by workforce rejection of new technology approaches and inadequate system infrastructure capabilities.

Professional development for staff, alongside dependable technical help systems and regular updates on hardware and software, constitutes necessary solutions for these education issues. To maximize the potential of these technologies, both administrative and academic staff require regular training and professional development.

School management needs ICT strategies to deliver better administrative outcomes and stronger decision-support systems. For these technological interventions in public secondary schools to continue to work and be successful, resistance issues and infrastructure limitations need to be fixed.

5.1.3 ICT Practices and Decision-Making in Education

The study data shows that technological adoption in education leads to major effects on both decision processes and student enrollment rates. A large number of educational institutions report enhanced outcomes due to their adoption of technological programs since these digital initiatives have decreased pupil withdrawal rates by 20%. The extensive reduction surpasses previous estimates, indicating that technological resources can successfully tackle educational retention issues while sustaining student enrollment.

The results display a 15% student performance increase, demonstrating how technological tools, including digital learning platforms with adaptive systems, lead to better academic results. With these tools, teachers provide students better customized learning experiences while improving their educational results and academic outcomes.

Through advanced diagnostic tools, educational professionals now discover learning challenges before they become significant roadblocks for their students. Schools utilize technology to identify

individual student learning requirements through data analysis, which in turn generates prompt personalized assistance to address learning deficiencies, thereby boosting educational achievement.

The research shows that technological tools enable improved educational cooperation between educational professionals, along with student bodies and community members. Through enhanced communication systems and shared digital content, educational processes have become more connected, leading to effective learning experiences among teachers and their students.

However, despite these successes, the study points to several challenges. Lack of sufficient trainer development stands as an obstacle that prevents educators from maximally using technological resources effectively. The reliability of results has suffered due to various inconsistent data collection approaches. Effective implementation of technology in education requires confirmed educational programs alongside standardized protocols,, as weaknesses in either space will diminish the potential benefits of using technology in education.

5.1.4 Administrative ICT Integration Initiatives

Findings reveal that school administrators successfully implemented Information and Communication Technology (ICT) integration by designing structured educational initiatives. Successful implementation reached 75% after establishing teacher training workshops, which emerged as the lead educational strategy. The workshops on education gave teachers the basic skills they needed to incorporate technology into their lessons, which sped up the move toward ICT-based teaching methods.

Administrators developed technology partnerships that affected 65% of schools as they pursued these connections. By creating technological partnerships, schools gained access to modern equipment and

software solutions together with maintenance support, which allowed them to keep their educational spaces technologically advanced.

Technological infrastructure received substantial funding from schools that reported improved capabilities of 70%. The infrastructure improvement involved the purchase of updated devices alongside the improvement of network capacity and deployment of digital learning solutions. The made investments through technology labs have set the groundwork for technology adoption in educational practices throughout the teaching and learning activities.

Administrators worked on creating professional growth. initiatives to make teachers ready for current technological shifts. Professionals in the education field got professional development through maintenance- and theme-based programs that helped them keep up with new ICT trends and best practices in education that were needed in their field.

School administrators made community engagement their final initiative to secure support for the adoption of information and communication technologies. Mindful collaboration between schools and parents, along with local organizations, developed an environment that encouraged resource sharing toward technology-based educational progress.

5.2 Conclusions

5.2.1 Conclusion on ICT Integration and Academic Performance

This research demonstrates that ICT implementation stands as a crucial factor that advances academic results in public secondary institutions. Schools with complete digital learning technology developed through projector and educational application and interactive whiteboard purchases achieved higher

student success rates, especially in science and mathematics classes. The integration of ICT tools with curriculum planning combined with trained educator usage demonstrated the most substantial positive impact in educational institutions. The combination of strategic ICT implementation in schools led to higher average test grades that surpassed those of schools with limited ICT involvement by approximately 30%. Lei et al. (2021) established the same conclusion about ICT increasing student performance rates through the right educational framework, which these findings support. Lack of fair distribution of infrastructure and access networks creates operational obstacles that affect rural populations especially badly. ICT serves as an important learning accelerator when it is linked to educational objectives and used to develop teacher capabilities (Fernández-Gutiérrez et al., 2020).

5.2.2 Conclusion on ICT and School Administrative Efficiency

The integration of ICT systems has been shown to boost administrative tasks in public secondary schools effectively. Schools that use digital management systems, like student information systems with automatic scheduling tools and online communication tools, have improved how they handle paperwork and scheduling. The collected numerical data indicated substantial decreases in time-consuming activities connected to record management and class setup and information analysis reporting. Automated attendance systems show real-time flagging of students who miss classes, thus enabling prompt attention to absent students. Institutional efficiency through streamlined operations was confirmed by Villegas-Ch. et al. (2021) as a benefit resulting from ICT usage. Administrators achieved better staff and parent communication through WhatsApp and bulk SMS systems that replaced traditional noticeboard postings. All educational institutions showed varying degrees of ICT usage, yet the relationship between ICT implementations and administrative responsiveness remained

steady. Modern school governance as well as operational efficiency completely depend on a strategic implementation of ICT technology.

5.2.3 Conclusion on ICT in Data-Informed Decision-Making

The investigation documents how mounting numbers of educational administrators continue to adopt information and communication technologies for evidence-supported decision-making processes. The combination of dashboards with digital performance trackers and budget monitoring tools in schools increased their speed to address student requirements while detecting curricular weaknesses and budgetary problems. Data-driven leadership enabled administrators to discover failing subjects while they allocated resources correctly alongside checking intervention results. Papadopoulos and Hossain (2023) recognized that organizations worldwide leverage ICT for making decisions, which directly improves their agility along with performance outcomes. Data visibility in this research project created transparent and accountable environments between departments while streamlining institutional objectives to all parties. The implementation of behavioral analytics facilitated quick, decisive actions when students showed behavioral or academic deterioration, thus proving the value of getting data promptly. Data literacy training stood as a necessary requirement because untrained administrators struggled to achieve maximum benefits from their available tools. Software development through information and communication technology brings improved decision outcomes yet requires staff training and data-driven school operating procedures.

5.2.4 Conclusion on Administrator-Led ICT Initiatives

Effective integration of ICT depended heavily on the work conducted by administrators. The research observed visionary leadership as the key factor that allowed these schools to excel beyond others

regarding their digital advancements and educational improvements. Schools implemented four essential initiatives to advance their ICT programs by providing professional development for teachers through internal training sessions as well as non-government organization partnership donations and policy creation and establishing school-led ICT groups. The findings presented by Kamau and Njoroge (2023) demonstrate that proper leadership advancement forms the backbone for maintaining ICT adoption. High-performing schools under the leadership of their principals effectively used motivational skills to drive staff toward new approaches for change. Effective administrators integrated ICT as an integral part because they understood it to be essential to their school development strategy. The absence of structured leadership in schools led to insufficient masterful implementation of ICT along with slow acceptance from educational staff. The research proves leadership plays an essential role in making ICT function educationally when planned properly and backed by infrastructure development and teacher training.

5.3 Recommendations for Practice

The study makes the following recommendations:

i. The study found that the key barriers to ICT integration and academic performance, along with insufficient ICT implementation in teaching practices, were influenced by limited digital literacy. The research recommends that educational institutions create detailed digital literacy systems to teach all stakeholders about technology implementation, which leads to higher academic achievement while lowering school abandonment rates. Educational institutions should develop specialized training programs for teachers that build their ability to incorporate Information and Communication Technology into classroom instruction methods while supporting improved student interest and academic results. Exemplary implementation of technology-enabled learning methods must become

standard practice throughout schools to build flexible learning systems that support all students effectively. Significant research on a timescale should track ICT influences on academic performance so educators can ground their strategy development in scientific evidence.

ii. Research on ICT strategies in school management shows that both inadequate strategy implementation and weak accountability systems obstruct advancement. Engineering new incentive systems through grants or recognition frameworks is recommended by the research to make educators and administrators adopt ICT management practices in schools. Schools need to establish comprehensive monitoring frameworks with specific performance metrics to both track their progress with information and communication technology and guarantee evolving advancement in ICT usage. The investigation of ICT integration differences across regions should form part of recommendations for creating localized strategies that overcome specific regional challenges.

iii. The research on ICT practices and decision-making identified limited utilization of advanced data tools and underutilized artificial intelligence technologies as major challenges. The assessment urges schools to adopt state-of-the-art data analytics solutions that enable accurate learning problem detection and evidence-based decision-making. As the next step, schools should look into both new and old technologies, especially artificial intelligence, because it can help improve diagnostic tools, create personalized learning programs, and update outdated management techniques.

iv. The study into Administrative ICT Integration Initiatives found that there wasn't enough money for ICT infrastructure and that practices weren't always carried out correctly. The study suggests schools should boost their ICT infrastructure spending to establish dependable internet access and modern devices and leading learning tools. As a recommendation, the study promotes strategic technology partnerships between schools so they can use modern resources and expert knowledge to

build sustainable ICT adoption systems. Schools must identify and solve various implementation obstacles throughout diverse educational settings by concentrating on training inadequacies along with data collection inconsistency problems.

v. The Ministry needs to launch a national digital literacy framework for educators' students and stakeholders. Such a framework would deliver systematic training about technical application in education to improve academic performance, build digital skills, and help essential personnel become adept at using ICT throughout teaching and learning operations.

vi. The Ministry should direct its attention to raising ICT infrastructure funding within schools so students can use dependable networks with contemporary technology and modern educational tools. The ministry should use available funds to create specialized professional development programs that enable teachers to incorporate information and communication technology into their educational practices for a modern curriculum adaptation.

5.3.1 Recommendations for Administrators and Policymakers

Although cost controls pose a unique and considerable challenge for health care administrators and policymakers, they are also a fundamental mechanism for facilitating the availability, affordability, and effectiveness of health care. School administrators are key to facilitating ICT integration in their schools and achieving the intended goals. Promoting ICT use at the school level requires principals and other school leaders to provide necessary encouragement and guidance to teachers and other learners. To increase schools capacity, a policy should be put in place that requires schools to hold training sessions where any necessary skills pertinent to the use of ICT are equipped to the teachers and the administrative staff as and when their services are needed. Also, administrators need to set

clear objectives for each part of integrating ICT and ways to check the effectiveness of new methods, like using analytical tools and tools to track performance improvement. All these administrative endeavors, put together, provide a framework for the sustainable development of technology in education.

Education stakeholders have to put in place coherent strategies and policies that may help promote and maintain effective integration of ICT throughout schooling. This starts with policy actions that provide detailed objectives, tactics, and measurable targets for utilizing ICT in learning and teacher training, as well as creating policies regarding infrastructure provision and funding. Policymakers need to establish award and recognition systems for schools and teachers that set outstanding examples of effective use of ICT for learning, at a cost of monetary incentives, access to other incentives, or additional materials. Additionally, there will be increased support from local communities to support ICT initiatives to help in the mobilization of resources and promote the use of these technologies. These coordinated policy efforts will allow for the creation and sustaining of a strong environment that supports educational technology.

The implications of this study therefore point to the importance of integrating ICT management in public secondary schools. Through the coordination of policies, practices, and research, stakeholders can optimize technology in order to improve education outcomes as well as the efficiency of schools. This highlights a need to confront developmental issues like inadequate resource endowment, lack of qualified human capital, and disparities in infrastructural development. Therefore, the use of ICT in education needs to be promoted in order to be made a priority for the sustainable development of the education sector.

5.3.1 Recommendations for Further Research

i. A study could be conducted to evaluate the effectiveness of ICT integration in private secondary schools.

ii. A study could be conducted to investigate the dynamics influencing the implementation of ICT strategies in public secondary schools.

iii. A study could be conducted to examine the role of school preparedness in implementing ICT integration effectively in public secondary schools.

5.4 Final Reflection

The study establishes that information and communication technology integration delivers transformative effects that modify education delivery while influencing both teaching approaches and leadership methodologies in schools. The research demonstrates that purposeful ICT implementation, which combines leadership vision with good infrastructure and continuous staff training, leads to significant academic gains along with operational enhancements. Schools throughout Nyandarua West Sub-County experienced better student results and improved operational transparency as well as coordination and innovative practices from their complete ICT implementation. Sutrisno et al. (2023) noted through their work that educational digital transformation succeeds when all four elements of infrastructure, policy, pedagogy, and human capital are systematically addressed. The research findings reveal that ICT represents no single solution because its impact relies on special program implementation strategies made by all parties, from officials to teachers and students to community members. The findings from this research provide Kenya with specific guidelines to implement ICT, yet these become effective only through strategic plans that embrace inclusivity and adaptability.

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APPENDIX I

LETTER OF INTRODUCTION

FEBRUARY 2024

Dear Sir/Madam,

RE: PERMISSION TO CARRY OUT RESEARCH

I am a student taking a Master of Education course in Education Administration, Management and Leadership at Mount Kenya University. My research topic is **the influence of ICT Integration. Management on Academic Performance in Public Secondary Schools in Nyandarua West Sub County, Nyandarua County, Kenya.** To accomplish this, you have been selected to take part in the study. I request you, as a respondent, to fully participate in the study. This information will be used purely for academic purposes, and your details will not be mentioned in the report. Results of the study shall be availed to you upon request. Your support and co-operation will be highly treasured. I appreciate any help you can provide.

Yours faithfully,

Wanjiru Mwihaki.

APPENDIX II

INFORMED CONSENT FORM

Dear respondent,

The researcher is a student undertaking a Master of Education course in Education Administration, Management and Leadership at Mount Kenya University. The research topic is: **Influence of ICT Integration Management on Academic Performance in Public Secondary Schools in Nyandarua West Sub County, Nyandarua County, Kenya.** Please give me some time for this study as you will be asked some questions. I will ensure your privacy and confidentiality about your information are maintained. Your personal details will not be written on any materials; only the researcher will have access to your information. Your involvement is voluntary, and you are allowed to change your mind and withdraw at any time before and during the study. We will not pay for this contribution. If you want to take part in this research, please sign the form.

Participant: **Code of Participant:** **Signature:**

Researcher: **Signature:**

APPENDIX III

Research Questionnaire for School Personnel

Dear respondent,

` The researcher is a student undertaking a Master of Education course in Education Administration, Management and Leadership at Mount Kenya University. The research topic is: **Influence of ICT Integration Management on Academic Performance in Public Secondary Schools in Nyandarua West Sub County, Nyandarua County, Kenya.** The information you provide will be treated with discretion and only used for this study.

Section A: Demographic Information of Respondents

Please tick the appropriate answer

1. What best describes you?

   a) Male {}

   b) Female {}

   c) I would rather not say {}

2. What is your marital status?

   a. Single {}

   b. Married {}

   c. Divorced {}

d. Separated {}

3. In what age category do you fall under?

a. Less than 20 years {}

b. 20-30 {}

c. 30-40 {}

d. 40-50 {}

e. Above 50 {}

Section B: Research Questions

1. What is your role in the public secondary school?

a) Teacher

b) Administrator

c) ICT Coordinator

d) Other (please specify)

2. How often do you use ICT tools for teaching and learning?

a) Daily

b) Weekly

c) Monthly

d) Rarely

3. How would you rate your school's current ICT infrastructure level?

a) Excellent

b) Good

c) Average

d) Poor

4. To what extent do ICT integration management practices impact academic performance in public secondary schools?

a) Significantly

b) Moderately

c) Slightly

d) Not at all

5. How effective are the ICT integration management strategies in improving school management practices?

a) Very effective

b) Somewhat effective

c) Not very effective

d) Not effective at all

6. How do you perceive the influence of ICT integration management practices on decision-making within school management?

a) Strongly positive

b) Somewhat positive

c) Neutral

d) Negative

7. What initiatives are essential for facilitating effective ICT integration management in public secondary schools? (Select all that apply)

a) Regular training for teachers on ICT usage

b) Adequate budget allocation for ICT infrastructure

c) Collaboration with external ICT experts or organizations

d) Implementing a clear ICT integration policy

e) Other (please specify)

8. Have you observed any challenges or barriers to effective ICT integration management in your school? (Select all that apply)

a) Lack of funds for ICT infrastructure

b) Resistance from teachers or staff

c) Inadequate technical support

d) Insufficient training opportunities

e) Other (please specify)

9. How do you think ICT integration management can be further improved in your school?

(Open-ended question)

10. Overall, how satisfied are you with the current state of ICT integration management in your school?

a) Very satisfied

b) Satisfied

c) Neutral

d) Dissatisfied

e) Very dissatisfied

Thank you for your participation! Your feedback is valuable for our research.

APPENDIX IV

INTERVIEW GUIDES

For Students:

Title: Maximizing Academic Performance through ICT Integration

Objectives

- ✓ Understand the role of ICT integration in improving academic performance.
- ✓ Learn how to utilize ICT tools for learning purposes effectively.
- ✓ Explore ways to enhance your academic performance through ICT integration management practices.

Instructions

1. How familiar are you with ICT tools and resources for learning?

a) Very familiar

b) Somewhat familiar

c) Not very familiar

d) I am not familiar with it at all

2. How often do you use ICT tools for studying and completing assignments?

a) Daily

b) Weekly

c) Monthly

d) Rarely

3. Have you received any training or guidance on how to use ICT tools effectively for learning?

a) Yes, extensively

b) Yes, somewhat

c) No, not at all

4. How confident are you in your ability to incorporate ICT tools into your study routine to improve academic performance?

a) Very confident

b) Somewhat confident

c) Not very confident

d) Not confident at all

5. Would you like to receive more support and training on using ICT tools for learning?

a) Yes, definitely

b) Yes, maybe

c) No, not really

d) No, not at all

APPENDIX V

B: Interview Guide for Teachers:

Title: Enhancing School Management through Effective ICT Integration

Objectives

- ✓ Understand the significance of ICT integration management in improving school management practices.
- ✓ Implement effective ICT integration strategies to enhance teaching and administrative processes.
- ✓ Evaluate the impact of ICT integration on decision-making within the school context.

Instructions:

1. How comfortable are you with using ICT tools for teaching purposes?

   a) Very comfortable

   b) Comfortable

   c) Somewhat comfortable

   d) Not comfortable at all

2. How often do you incorporate ICT tools into your teaching methodologies?

   a) Daily

   b) Weekly

c) Monthly

d) Rarely

3. Have you received training or professional development on integrating ICT into your teaching practices?

a) Yes, extensively

b) Yes, somewhat

c) No, not at all

4. How effective are ICT integration management strategies in improving school practices?

a) Very effective

b) Moderately effective

c) Slightly effective

d) Not effective at all

5. Would you like more support and resources for integrating ICT into your teaching methods? a) Yes, definitely

b) Yes, maybe

c) No, not really

d) No, not at all

APPENDIX VI

C: Interview Guide for School Administrators:

Title: Facilitating Effective ICT Integration Management in Public Secondary Schools

Objectives

- ✓ Recognize the importance of ICT integration management in achieving educational goals and improving overall school performance.
- ✓ Identify initiatives and strategies to support effective ICT integration in teaching, learning, and administrative processes.
- ✓ Foster a culture of innovation and collaboration to facilitate successful ICT integration within the school community.

Instructions:

1. How would you rate the current level of ICT integration management in your school?

    a) Excellent

    b) Good

    c) Average

    d) Poor

2. What initiatives have been implemented in your school to facilitate effective ICT integration management?

    a) Regular teacher training on ICT usage

b) Investment in ICT infrastructure

c) Collaboration with external ICT experts

d) Development of ICT integration policies

3. How do you perceive the impact of ICT integration management practices on decision-making within school management?

a) Strongly positive

b) Somewhat positive

c) Neutral

d) Negative

4. What challenges have you encountered implementing effective ICT integration management in your school?

a) Lack of funds for ICT infrastructure

b) Resistance from teachers or staff

c) Inadequate technical support

d) Insufficient training opportunities

5. How satisfied are you with the current state of ICT integration management in your school? a) Very satisfied

b) Satisfied

c) Dissatisfied

Thank you for your participation

APPENDIX VII: RESEARCH LICENSE

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **163039**

Date of Issue: **13/January/2025**

RESEARCH LICENSE

This is to Certify that Miss.. Esther Mwihaki Wanjiru of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nyandarua on the topic: INFLUENCE OF ICT INTEGRATION MANAGEMENT ON ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN NYANDARUA WEST SUB COUNTY, NYANDARUA COUNTY, KENYA. for the period ending : 13/January/2026.

License No: **NACOSTI/P/25/415021**

163039

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

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See overleaf for conditions

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)

Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
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    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
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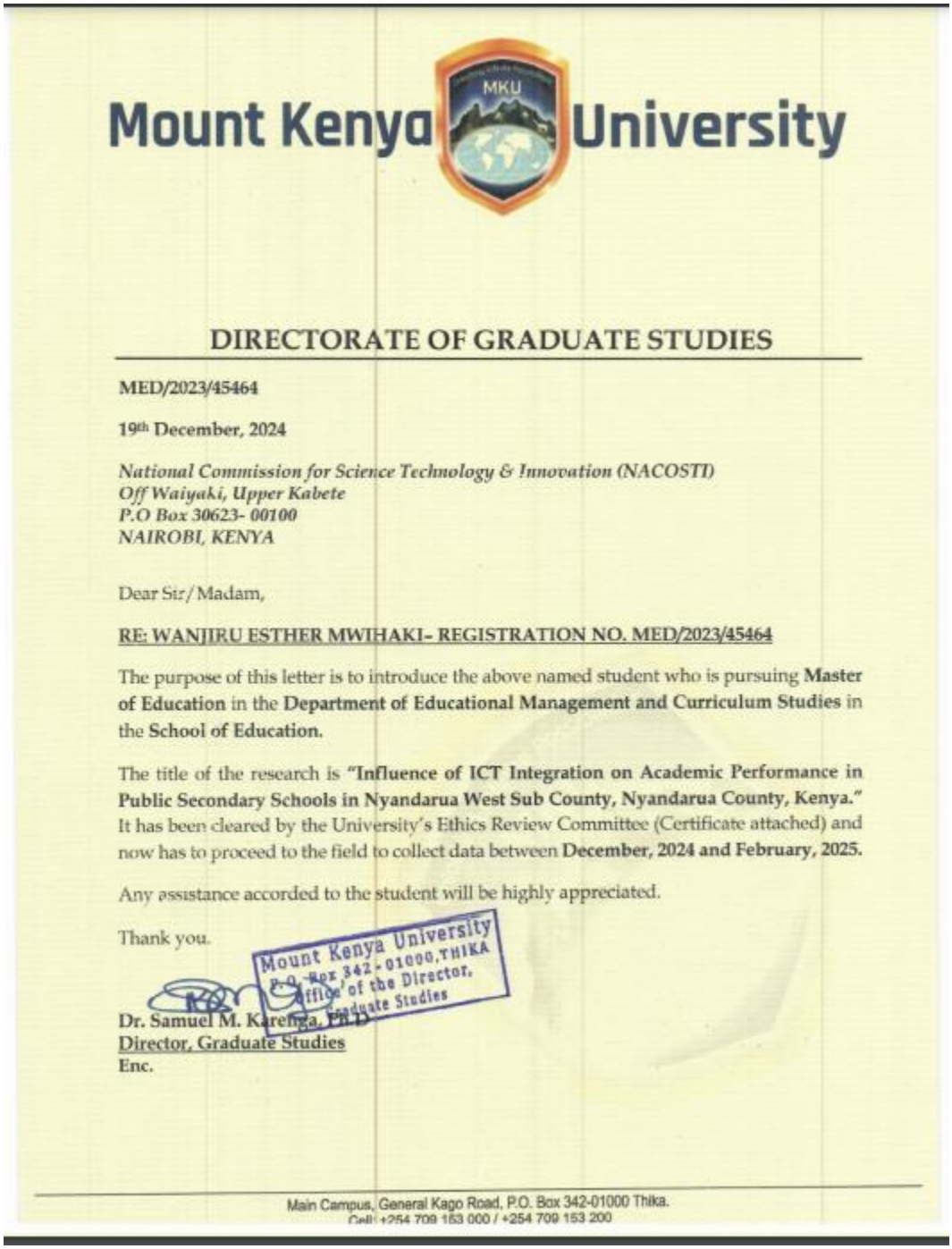
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
Website: www.nacosti.go.ke

APPENDIX VIII: RESEARCH AUTHORIZATION



Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MED/2023/45464

19th December, 2024

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki, Upper Kabete
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: WANJIRU ESTHER MWIHAKI- REGISTRATION NO. MED/2023/45464

The purpose of this letter is to introduce the above named student who is pursuing **Master of Education** in the **Department of Educational Management and Curriculum Studies** in the **School of Education.**

The title of the research is **"Influence of ICT Integration on Academic Performance in Public Secondary Schools in Nyandarua West Sub County, Nyandarua County, Kenya."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **December, 2024 and February, 2025.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P.O. Box 342-01000, THIKA
Office of the Director,
Graduate Studies

Dr. Samuel M. Kareriga, Ph.D.
Director, Graduate Studies
Enc.

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Cell: +254 709 153 000 / +254 709 153 200

APPENDIX IX: RESEARCH AUTHORIZATION

REPUBLIC OF KENYA
MINISTRY OF EDUCATION
STATE DEPARTMENT FOR BASIC EDUCATION

Email:cdenyandcounty@gmail.com
Cellphone: 0724592378
When replying please quote

COUNTY DIRECTOR OF EDUCATION,
NYANDARUA COUNTY,
P.O. BOX 197 – 20303,
OL'KALOU.

CDE/NYA/GEN/19/VOL.11/72 **5TH FEBRUARY, 2024**

Esther Wanjiru Mwihaki
Licence No: NACOSTI/P/25/415021

RE: RESEARCH AUTHORIZATION.

Reference is made to your letter dated 19th December,2024, to carry out a research on **"Influence of ICT Integration on Academic Performance in Public Secondary Schools in Nyandarua West."** I am pleased to inform you that you are hereby granted permission to carry out the exercise for the period ending **28th February, 2025.**

Please note that while undertaking the exercise you are required to strictly adhere to the Conditions of the Research Licence (The Science, Technology and Innovation Act).

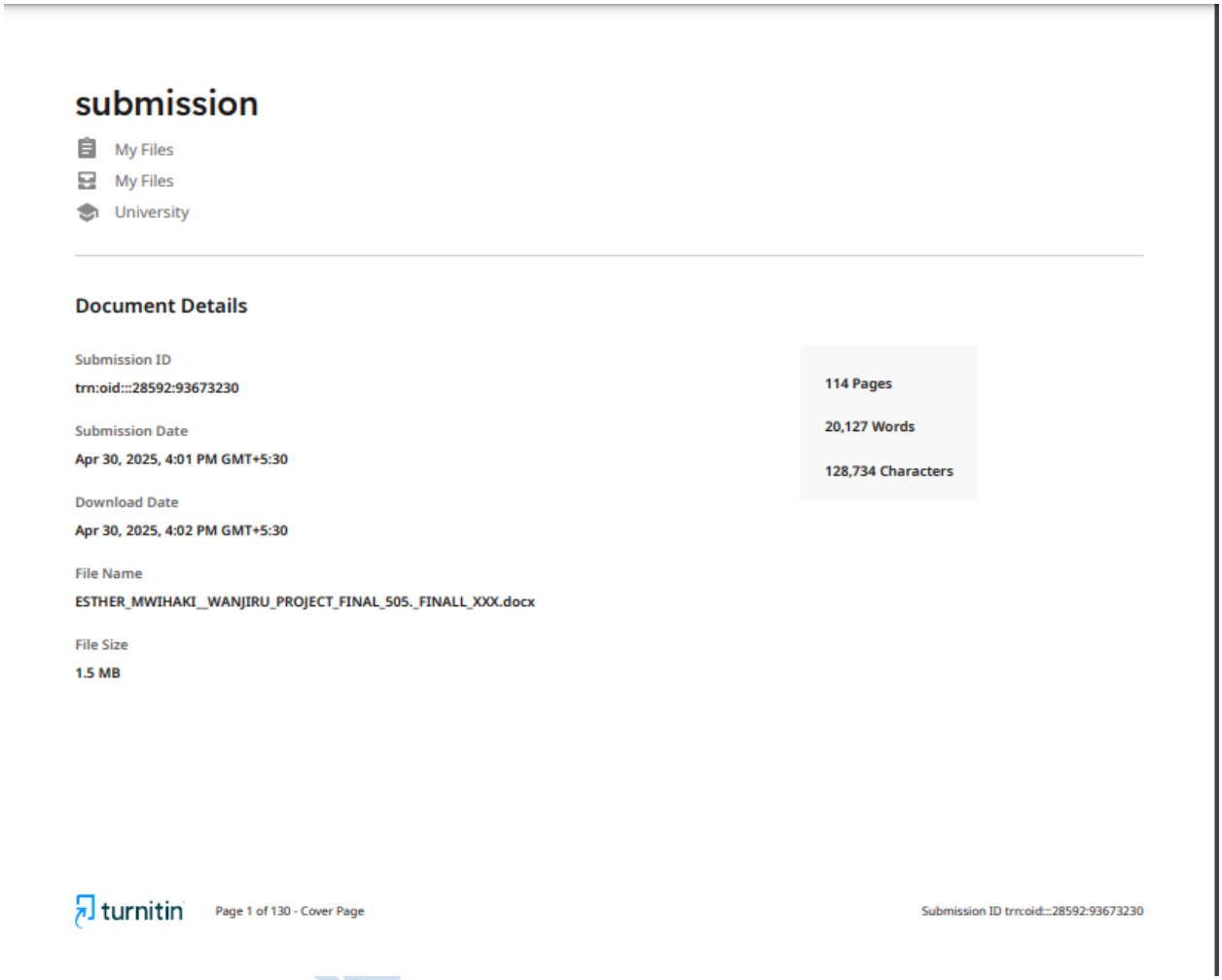
After completion of your project, you will be required to remit a copy of your findings to this office.

We wish you all the best.

PHILIP K. WAMBUA
COUNTY DIRECTOR OF EDUCATION
NYANDARUA.

APPENDIX X: MAP OF OLJOROROK CONSTITUENCY SHOWING NYANDARUA WEST SUB COUNTY

APPENDIX XI: PLAG REPORT



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