



**THE INFLUENCE OF PRINCIPALS' ICT INTEGRATION STRATEGIES ON
ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN CHIAKARIGA
SUB-COUNTY, THARAKA NITHI COUNTY, KENYA**



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DECLARATION

Declaration by the Researcher

This project is my original work and has not been presented to any other academic institution for any award.

Signature:



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Approval by the Supervisor

I confirm that the work reported in this research project has been carried out by the candidate under my supervision.

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ABSTRACT

In contemporary society, the integration of technologies in learning institutions is one of the hotly debated topics across the globe. Many institutions of learning have embraced the utilization of ICT and institutional heads' roles as far as their application and incorporation in instruction and administration have not been pinpointed clearly. Therefore, this research project concentrated on evaluating the influence of principals' ICT integration strategies on school performance in Chiakariga Sub-County, Tharaka Nithi County, Kenya. The research was grounded on four objectives, which included: To determine the influence of principals' provision of technology materials on academic performance in public secondary schools in Chiakariga sub-county Tharaka Nithi County, Kenya. To ascertain the effect of principals' advocacy for ICT integration on academic performance in public secondary schools in Chiakariga sub-county Tharaka Nithi County, Kenya. To investigate how principals' overall supervision of ICT integration on academic affect performance in public secondary schools in Chiakariga Sub-County Tharaka Nithi County, Kenya. To assess the impact of principals' support on teachers ICT capacity building on academic performance in public secondary schools in Chiakariga Sub-County Tharaka Nithi County, Kenya. The research project is significant in the sense that findings from this study shed light to school managers about their roles, resulting in the promotion of efficiency and effectiveness in the instructional process, resulting in improved academic performance. Besides, the results can be useful to policy developers at the Ministry of Education since it will deepen their understanding of the responsibilities of school administrators in ICT incorporation and how this is likely to improve academic performance. The researcher used a mixed methodology approach and descriptive design. The target population was 2555 respondents and comprised of 9 school heads, 155 teachers, 2390 students from public secondary schools. Yamane's Formula was utilized by the researcher to determine the sample size. The investigator used purposive sampling and simple random sampling to get the sample. Data were analyzed quantitatively and qualitatively. The findings indicate that principals have a significant role in shaping ICT infusion within schools. Availability of ICT resources, such as computers and projectors, was found to significantly enhance student engagement and personalized learning, though obstacles such as limited access to certain materials and misuse of ICT were identified. Recommendations include, but not limited to the presence of ICT materials and strengthening advocacy strategies. Future research should focus on longitudinal studies of ICT integration, comparative regional analyses, and the role of non-academic ICT use in schools.

Keywords: School management, ICT integration, and expert judgment.

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LIST OF ABBREVIATIONS AND ACRONYMS

ICT:	Information, Communication and Technology
MoE:	Ministry of Education
TSC:	Teachers' Service Commission
CAI:	Computer Aided Instruction
NGOs:	Non-Governmental Organizations
EDRs:	European Data Relay Systems
OER:	Open Education Resource
TAM:	Technology Acceptance Model
TPACK:	Technological, Pedagogical, And Content Knowledge
CBET:	Competency-Based Education and Training
TVET:	Technical and Vocational Education, and Training
KNBS:	Kenya National Bureau of Statistics
SPSS:	Statistical Package for the Social Sciences

DEFINITIONS OF OPERATIONAL KEY TERMS

Term	Meaning
Integration Strategies:	Refer to approaches that school heads use to promote the use of ICT in schools.
Academic Performance:	Achievements of students after they complete four year course in secondary schools.
Digital Revolution:	Advancement in the use of technology where people have embraced the use modern technology and left analog and mechanical devices.
Demographic Information:	It refers to data of the participants, such as gender, education level, and professional experience.
Principals:	Heads of institutions or persons in charge of secondary schools
Principals' advocacy:	Refers to the ways or methods school heads utilize to promote the employment of ICT in institutions.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter has focused on the background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, rationale of the study, significance of the study, assumptions of the study, scope of the study, delimitations of the study, and limitations of the study.

1.1 Background of the study

In contemporary society, the infusion of information, communication, and technologies (ICT) in secondary institutions to improve academic performance has become one of the hotly debated topics among the education stakeholders. The challenge of ICT infusion is more cultural than technological, implying that nations have the duty of not merely providing ICT resources, but also fostering a culture of adoption among its final consumers. Poor academic performance has been lately associated with the application of conventional methods of teaching. According to Polizzi (2011), flourishing of the execution of technology in instructional processes mostly depends on how educators perceive it because school heads eventually determine how they are utilized in the classroom to improve academic performance. School heads have decisive roles in promoting ICT incorporation in learning institutions (Salam et al., 2018). This is because principals foster its utilization at strategic and action levels, schools, educators' ICT competencies and frequency of use as well as teachers' perceptions towards its usage in a school set up (Kukali et al., 2013). This in turn has great significance in academic performance in education institutions.

In Palermo, Italy, Polizzi (2011) found that education managers in institutions of learning have a significant responsibility to play in media and technology incorporation at a pivotal level, advocating the introduction of ICT in education activities, teaching included. According to the scholar, school principals plan and promote teachers' involvement in the infusion process through focused training programs. As a result, teachers impact significantly on the overall ICT application

in subject teaching, fostering improved academic performance outcomes. This argument is supported by Wildermuth (2018) who posit that the knowledge instructors acquire in training courses about the instructional methods aspect of integrating technology strongly correlates with their opinions about how ICT influences the educational system and in turn influence how it is disseminated to learners to improve academic performance.

In Georgia, and Europe, principals are viewed as the drivers for effective ICT execution in schools as well as improved academic performance. The pace set by the school heads affects the entire school environment, instructional process included. For instance, in Title I rural school principals have a vision and ultimate goals for their schools about technology use (Dunham, 2012). While technology coordinators plan at district level, principals participate in planning at similar levels and teachers plan at the classroom stage. Such planning is important because it ensures that institutions achieve more in terms of ICT integration, something that promotes academic performance. Researchers Basri and his team looked at how using technology tools, like computers, can change how well students do in school. They did this study in 2019 in Saudi Arabia. They found that when students use these tools, they perform better in school. This was even true in places where people have traditional values. Besides, there were more improvements on female students than their male counterparts when ICT was integrated.

In the Volta and Greater Accra regions in Ghana, effective ICT integration into colleges has been attributed to principals' roles and their proficiency in ICT utilization (Abraham Lois, et al., 2019). According to the scholars, principals in the aforementioned regions in Ghana motivated their teachers to incorporate technology in classroom teaching since they acted as role models and provided the necessary resources. This eventually improved academic performance in the region.

In Kenya, the first ICT nationwide policy was adopted in 2006 after many years of struggling to develop one. According to Sessional Paper No.1 of 2019, education is expected to be changed to

meet the twenty-first-century needs of the state (Meru & Kinoti, 2022). The Kenya Vision 2030 has identified science, digital education, and advancement as the core pedals to drive the nation to a higher level economy (Wildermuth, 2018). The Stakeholders initiated the ICT Master Plan, 2014-2017, whose aim was to drive the country to be an exceptional ICT centre as well as an internationally competitive digital economy (Wildermuth, 2018). The objectives set out in the aforesaid master plan are reemphasized in the Kenya National Digital Plan 2022-2032, which recognizes the crucial function of ICT in education, which is critical to the economic development of the state. Although Kenyan authority has put a lot of effort to promote efficiency, effectiveness, and reliability in the management of institutions through ICT integration, little attention has been given to establishing whether principals have any role and whether their ICT integration strategies influences in ICT integration as well as the overall school performance outcomes, academic outcome included.

In Tharaka Nithi County, education stakeholders emphasize infusion of ICT in learning institutions, just as is the case in other counties. Many efforts have been put up to promote academic performance with each zone developing its unique strategy to outdo the other. However, it is worrying to note that in this county, specifically, Chiakariga Sub-county, the utilization of ICT, and particularly, the approaches employed by school heads to promote ICT utilization is given little attention. For example, there are only two schools that are categorized as ICT centers of excellence (Njeru & Wanjau (2020). This is despite the scholars associating ICT integration with huge benefits in terms of academic performance. A large area of the sub-county is inaccessible, implying that internet services are insufficient, hindering its use in schools. Notably, many learning institutions have essential ICT resources as well as finances that can be used to acquire ICT equipment and software, but they are not utilized as expected as observed by Njeru and Wanjau (2020). Surprisingly, an institution could be having several computers, which are either unutilized

or underutilized probably because teachers are either unqualified in ICT use or lack of interest to register computer as a subject by the management. Records from the sub-county director indicate that only one public secondary school and one private secondary have registered computer as a subject, in spite of the many attempts by the government to incorporate ICT in the running of institutions, teaching included. Regardless of who is to blame, the fact is school principals' roles in promoting ICT integration in learning to promote academic performance in institutions cannot be underestimated.

1.2 Statement of the Problem

Promoting improvement in educational performance outcome is one of the critical roles of the school managers (Díaz & Cano, 2019). Most school heads have sought to utilize diverse methods to promote academic success in their institutions. Among them is the incorporation of ICT in instructional process and school administration, which is one of objectives of the Kenya National ICT policy (Salam et al., 2018). A few schools have embraced ICT integration, but the responsibilities of institutional heads as far as its application and integration in instruction and administration is concerned cannot be pinpointed clearly (Díaz & Cano, 2019). Many learning institutions in the sub-county under investigation have continued to score poorly due to the use of conventional methods of teaching as indicated by Kinyua (2021). According to Kinyua (2021) a majority of principals lack adequate ICT competencies and end up doing ICT-related work in cyber or delegating to other teachers. This is despite the fact that principals have a significant role of influencing the achievement of educational goals in their institutions. Mwendwa (2017) asserts that principals should take the lead in promoting ICT integration in school curricula to prepare adequately for technological change with a view of improving academic performance. It is evident that many education administrators in Chiakariga Sub County Tharaka Nithi County, Kenya are reluctant as well as doubtful of benefits realized in academic performance with the use ICT

integration. Besides, it is observed that many schools' operations are manual and ICT equipment is utilized for ordinary activities, such as typing examinations and letters, indicating a lack of interest for teachers and administrators (Njeru & Wanjau (2020). This implies that teachers and principals have yet to understand the huge benefits associated with the use of ICT to foster academic success. If principals do not embrace adequate ICT strategies, teachers are unlikely to embrace it, implying the effectiveness and efficiency realized by its integration will not be achieved. Records of the schools that are found in the sub-county under study show poor academic performance in national exams, i.e., the Kenya Certificate of Secondary Education (KCSE) for the last five years as shown in the table below:

Table 1: KCSE performance for the last five years

Year	2019	2020	2021	2022	2023
Mean Score	3.12	3.42	3.029	2.99	3.45
Mean Grade	D	D	D	D	D

Source: *Office of the Principal, Tunyai Secondary School. Obtained from Sub-County performance booklets given to each school every year, indicating its Mean Score.*

Although several factors might have contributed to the declining performance above, it is indisputable that technology in teaching has far reaching positive impacts on academic outcomes. Its use should be embraced by both the teachers and the principals. A few investigations have concentrated on the role of principals in ICT infusion and how their leadership in this aspect influences academic performance. Therefore, this research project concentrated on assessing the influence of principals' ICT integration strategies on academic performance in public secondary schools in Chiakariga sub-county, Tharaka Nithi County, Kenya.

1.3 Purpose of the Study

The project concentrated on assessing the influence of principals' ICT integration strategies

on academic performance in Chiakariga sub-county, Tharaka Nithi County, Kenya.

1.4 Objectives of the Study

1. To determine the influence of principals' provision of ICT materials on academic performance in public secondary schools in Chiakariga sub-county Tharaka Nithi County, Kenya.
2. To ascertain the effect of principals' advocacy for ICT integration on academic performance in public secondary schools in Chiakariga sub-county Tharaka Nithi County, Kenya
3. To investigate how principals' overall supervision of ICT integration on academic affect performance in public secondary schools in Chiakariga Sub-County Tharaka Nithi County, Kenya.
4. To assess the impact of principals' support on teachers ICT capacity building on academic performance in public secondary schools in Chiakariga Sub-County Tharaka Nithi County, Kenya.

1.5 Research Questions

The research was based on the following research questions:

- 1) How do principals' provisions of ICT materials influence academic performance in public secondary schools in Chiakariga sub-county Tharaka Nithi County, Kenya?
- 2) To what extent do principals' advocacy of ICT integration influence academic performance in public secondary schools in Chiakariga sub-county Tharaka Nithi County, Kenya?
- 3) How does principals' overall supervision of ICT integration influence academic performance in public secondary schools in Chiakariga sub-county Tharaka Nithi County, Kenya?

4) To what extent do principals' support on teachers' capacity building influence academic performance in public secondary schools in Chiakariga sub-county Tharaka Nithi County, Kenya?

1.6 Rationale of the Study

Although the government has put many effort to promote efficiency, effectiveness, and reliability in the overall running of the learning institutions through ICT integration, little attention has been given to establishing whether principals' ICT strategies have any influence on academic performance or not. Not many studies have been done to determine whether what is documented about their roles in ICT integration is what is on the ground. Besides, it was essential to assess what influences do their ICT strategies have on academic performance, particularly on the instructional process and the management of the school. Therefore, this project assessed the influence of Principals' ICT integration strategies on academic performance in public secondary schools in Chiakariga sub-county, Tharaka Nithi County, Kenya.

1.7 Significance of the Study

Findings from this investigations will shed light to school managers about their roles, resulting in the promotion of efficiency and effectiveness in the instructional processes, and consequently improve educational performance. Besides, the results can be useful to policy developers at the Ministry of Education since it will deepen their understanding of the responsibilities of school administrators in ICT incorporation and how this is likely to improve academic performance. Moreover, the results will help the MoE and the TSC to create ICT guidelines that advocates recognition of school managers' leadership for ICT infusion into school curricula, which is critical to improved academic performance. Results from the sub-county under study gives insights into situations in other counties and Kenya at large. Teachers will also gain from the findings because they will understand the necessary support they are entitled to from the

school managers to enhance academic output. Findings will be important to students because once the roles of the principals are outlined; the instructional process will be more straightforward, leading to better understanding among them, resulting in improvement in academic performance. Notably, the society will gain because the institutions will release qualified technocrats who are fit in the job market. Above all, NGOs will gain since they will partner with the government in providing the requirements for ICT integration, leading to improved academic performance in schools

1.8 Scope of the Study

The researcher carried out the investigation in public secondary schools in Chiakariga sub-county, Tharaka Nithi County, Kenya only. Besides, it concentrated on the school managers' ICT integration strategies, such as the provision of ICT materials, advocacy of ICT integration, overall supervision, and support on human resource capacity building, and how they promote academic performance. A mixed methodology approach was utilized. The researcher utilized questionnaires to gather information quantitatively from instructors and interview guides were employed to obtain qualitative data from school heads. Additionally, researcher used twelve months to carry out the investigation.

1.9 Limitations of the Study

The researcher came across the following hindrances:

1. There was only one sub-county director in the sub-county; hence there was no option of selecting.
2. It was not easy to access some of the documents that proved that principals utilized and advocated ICT integration because the sub-county is new

3. Information obtained might be biased since some principals were unwilling to provide correct information concerning the ICT integration strategies they employ. The researcher reassured them of data confidentiality.

1.10 Delimitations of the Study

The project was grounded on the delimitations below:

1. It concentrated on sub-county director, principals, teachers, and students only.
2. Private secondary schools were excluded from the investigation and were delimited to public secondary institutions in Chiakariga Sub-county in Tharaka Nithi County.
3. The pollster focused on the principals' ICT integration strategies, such as providing ICT resources, advocacy roles, supporting teachers' capacity building, and overall supervision, on academic performance.

1.11 Assumptions of the Study

The investigation was grounded on the presuppositions below:

1. The respondent gave honest and objective responses on the questions asked.
2. The instruments for collecting data were credible and consistent in establishing the desired results.
3. The sample obtained reflected the true characteristics of the entire populace in its principal attributes.

Principals' ICT integration strategies have a significant influence on academic performance.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

In this chapter, the investigator presents the literature from the earlier investigations related to the investigator's areas of interest. The scientific analysis was grounded on the concept of school heads' ICT integration approaches in public secondary institutions and the influence of the principals' provision of ICT materials, principals' advocacy of ICT integration, principals' overall supervision of ICT integration, and principals' support on human resource capacity building on academic performance. The researcher provided different perspectives which different scholars have raised in diverse perspectives related to the subject matter being studied. The researcher also provided theoretical and conceptual frameworks as well as the key highlights of the literature evaluated while stating the gaps established.

2.1.0. Empirical Literature Review

Scientific review focused on the principals' ICT integration strategies in unrestricted secondary institutions, and how principals' provision of ICT materials, Principals' advocacy of ICT infusion, principals' overall supervision, and their support on teachers' capacity building on influence academic performance.

2.1.1 The concept of principals' ICT integration strategies

Globally, school principals have been identified as drivers of promoting ICT integration in the instructional processes. According to Prasojo and colleagues (2020), school heads have a duty to direct, promote, supervise, and support the learning process for tutors as well as students in their institution. International developments in learning have focused on incorporating ICT into the curriculum in learning institutions. In a study conducted in Spanish schools where a model of 142 principals was tested to find out core factors for the flourishing digital revolution of institutions, and how the technology influence academic performance, researchers revealed that principals are

the most significant factor in the digital conversion of learning institution as well as performance outcome, academic performance included (Navaridas-Nalda et al., 2020). Besides, the scholars have outlined other factors essential for digital transformation, which include contextual variables, technical support, and principals' professional and personal profiles. The authors concluded that school principals have the competence to promote an open discussion that can allow educational stakeholders to understand the incorporation of ICT into instructive forms as an opening to enhance the results of the curriculum implementation (Navaridas-Nalda et al., 2020). In this view, education policies about digital transformation should identify principals as key stakeholders in their definition. Indeed, principals have a crucial role in ICT integration and should be prioritized when developing curriculum design for ICT. Although Navaridas-Nalda and colleagues (2020) found that school heads have a lead responsibility in ICT infusion, the researchers have not provided the essential strategies they should employ to promote ICT integration in schools.

Nhlumayo (2024) from South Africa investigated the factors that influence the leadership approaches of institutional heads in Rural primary schools concerning ICT incorporation. According to the researcher, school managers should be well acquainted with innovative technologies in the midst of digital revolution, which is universal, multifaceted, and fast-paced to guide learning through technology incorporation. Prasajo and colleagues (2020) carried out research on principals' perception of ICT infusion barriers on Indonesian public schools to find out principals' perception of the barriers to integrating ICT in developing Indonesia. The researchers found teachers' understanding of technology, financial support in ICT training, conventional training approach, expert growth, and locality, and institutional culture as key barriers. Expansion of ICT integration for learning purposes was recommended by the authors. However, the authors have failed to identify principals' ICT incorporation strategies as an essential aspect to thriving ICT integration.

The application of ICT in secondary institutions is paramount and its integration should be embraced, regardless of its costs. Razak and colleagues (2019) investigated the bottlenecks instructors faced, the availability of ICT tools included and how school managers and other stakeholders can triumph over them. They came up with three main challenges and three ways of overcoming challenges. Inadequate schools' ICT tools, a lack of commitment to institutions' rules, and refusal to abide by the school rules were the main hindrances identified. In the midst of the many challenges that teachers face as they seek to improve academic performance, principals should be in the forefront, irrespective of their nature. The authors advocated for assisted performance, sharing of ideas and effective leadership style. Thus, the principals' ICT strategies cannot be underestimated when incorporating ICT in instructional process.

In a study conducted by Agyei (2021) in six countries from Africa, i.e., Kenya, Tanzania, Uganda, Ethiopia, Ghana, and Nigeria to find out whether teachers are able to incorporate technology in classroom after capacity building, the researcher discovered that teachers demonstrated satisfaction with content and processes they were trained, but there was a lack of essential conditions for the transfer of the learned knowledge to school level. This implies that principals should be included in such training for effective implementation at the school level. Principals have the role of leading other stakeholders in the school to implement what has been said. For example, after capacity building for teachers in ICT, the principals have to ensure teachers have implemented what they have learnt by providing the necessary support.

In Kenya, Mwiluli (2018) did an investigation to ascertain how ICT incorporation influences educational performance in public learning institutions in Makueni County. The investigator discovered that ICT was extensively used and influenced the academic performance positively and significantly. Improvement of content presentations during lessons promoted understanding because learners' interests were captured (Mwiluli, 2018). This is the case in many

other counties where principals take the lead. Similarly, in Chiakariga Sub County, ICT infusion in public secondary institutions is dependent on school heads who mediate its infusion into the education system by encouraging, supporting, and helping teachers to utilize ICT resources. School managers can be factors to hinder or facilitate ICT integration. According to Joseph (2022), most schools in Tharaka Nithi are deficient in school managers' influence on technology incorporation in instructional process. Although many principals have exhibited positive reactions towards computer use in their institutions (Lewis, 2020), they are not recognized as the drivers of ICT integration. Principals should be considered as role models, instructional leaders as well as visionaries.

2.1.2 Principals' Provision of ICT Materials

ICT resources are an important component of ICT integration in secondary schools. Without them desired academic outcomes would not be realized. Principals and teachers may be equipped with the necessary competencies, but without adequate resources, the process of integration will not be successful. However, availing ICT resources is among the critical roles of school managers.

Over the last twenty-five years, American schools have made access to technology, with principals taking active roles in ensuring the best use of ICT devices (Agasisti et al., 2023). It is important to underscore that providing educators with tools that facilitate personalized learning experiences, adapting to the unique needs of every learner and promoting knowledge retention are some of the benefits realized in American schools as Agasisti, and colleagues (2023) assert. These scholars have findings similar to the ones revealed in Spain by Gil-Flores and associates (2017) who conducted research to establish factors that elucidate technology utilization in secondary institutions at class level, and the task of educator attributes as well as ICT school environment. Their findings demonstrated that the accessibility of software, instructor ICT training, and

teamwork amongst educators was core to ICT integration. However, the researchers gave little attention to institutions' physical and internet connection infrastructure. Notably, the school managers should avail all the materials needed, ICT tools included. Without them, the success of ICT integration will be vain. In Chinese schools, the provision of reasonable and eminent e-learning or the utilization of modern technology at all stages of learning across the state is national priority. The Chinese government has made initiatives at national level for ICT use with the aim of consistently improving academic performance (Zhu et al., 2011). This is the case, despite its huge populace and regional differences.

In a research done by Emmanuel (2021) to assess the utilization of technology tools by the institution administrators' managers in the Cameroon system of education, the researcher revealed that principals rarely used technology tools in the management of staff and support staff and the supervision of physical and financial resources. The rare usage was attributed to unavailability. Since principals are role models in their respective schools, they should be at the forefront in not only utilizing ICT tools, but also making sure they are available. However, they have not said who should provide the required ICT resources. The provision of required resources is a critical component in leadership, and being key players in ICT integration, adequate ICT tools should be provided. The findings of this study closely relate to those of Tigere (2020) in South Africa who asserts that principals' ICT roles were manifested in organizing technological tools through networking with NGOs. Resources, such as laptops and super computer were obtained through establishing links with the NGOs (Emmanuel, 2021). ICT requires principals to be productive and proactive, implying it requires principals to develop diverse systems that may be vital in facilitating it. Besides, adequate resources help them to counter to new strain, challenges and eventualities that may crop up along the way (Mngadi, 2021). The environment of the contemporary globe, which is influenced by globalization, appears to be a huge undertaking for school administrators. According

to Mngadi (2021), a principal should bring into stability all parts of the institution that are required in the development of computerization for transformative valuable ICT realization.

The leaders in Kenya are putting a lot of money into computer technology. They want to teach people about this at every stage of learning. This way, more people get to use technology. In a year from 2013 to 2014, they started using more technology tools in all beginner schools. The Education Department said this in 2021. After that, they started a program to give computers to every high school. This helped more than three thousand high schools get computer technology. Importantly, Kenya's main laws say that everyone in Kenya has the right to learn. These laws also say that every child must attend school for basic education without having to pay. This is what the Education Department said in 2021. In this regard, ICT integration in education and training will actualize this provision. “Sessional Paper No. 1 of 2019 calls for ICT incorporation in education, training, and research, management, teaching and learning at all levels” (Abali et al., 2019, P. 49). The paper highlights how critical ICT is in changing education. It points out problems like access, quality, and fairness that school systems deal with. Besides, the text says that including everyone when getting ICT tools, teaching people to use them, keeping them safe, managing them, and using digital content for students and teachers who need special help is important. In Bungoma, Kenya, Nang’unda (2019) conducted an evaluation of school managers’ leadership in the aspect of employment of ICT in public secondary institutions. The author established that school managers’ leadership in technology is more inclined to infrastructural dynamisms than managerial, policy and edifying changes. However, this investigation does not provide specific resources that school administrators should emphasize on.

In Tharaka Nithi, Chiakariga Sub County, Julius (2018) from Kenyatta University carried out an investigation about the influence CAI on learners' accomplishments. The scholar contrasted CAI with other conservative approaches of instruction. Apart from discovering that learners who

were trained using CAI scored higher grades compared with those who were instructed using conventional methods, she found that teachers had a challenge of inadequate ICT resources. Thus, it is important to investigate and find out whether this problem is witnessed in Chiakariga Sub-County, and whether the principals in the sub-county understudy take this role seriously.

2.1.3 Principals' Advocacy of ICT Integration

Many governments across the globe have made diverse attempts to improve principals' competencies to lead ICT integration and promote instructional processes. Among them is the ability to improve their capability to infuse ICT in learning to improve performance. Navaridas-Nalda and colleagues (2020) carried a research in Spanish and noted that institutional heads can enhance digital culture change through fostering open discussions that permits educational stakeholders to view the incorporation of EDRs into teaching methods. The researchers did not highlight advocacy as a capacity to facilitate ICT integration in learning institutions. For effective ICT integration, Mngadi (2021) argues that principals should be viewed as the heart of the integration process. Thus, leading by example, developing ICT policy, and coming up with a vision are among principals' advocacy roles. In Guyana South America, the growing consensus is that for ICT assisted instructional to be successfully implemented, leadership and administrative support and essential. This implies that school heads who develop ICT policy and financial decisions should be trained on the application of technology and have the resources they need to make informed decisions. Evidently, principals should not necessarily be ICT champions, but should be aware of debates that surround elearning and understand the important role they play to ensure it is successfully used. In Palestine, Abukhalil and colleagues (2021) carried out research to assess how principals evaluated the usefulness of utilizing technology devices by educators during the COVID-19 pandemic. The scholars identified criteria, such as the use of technological tools for

communicating, stimulating, engaging, and attracting learners were used by the principals to evaluate. This is an indication that principals integrate technology tools in their management.

In the context of the advocacy role Mngadi (2021) who did an investigation in South Africa asserts that principals should be role models, instructional leaders, and visionaries. This implies that they should be well-informed about the ICT incorporation. The author has suggested that they should establish the context of ICT integration and clearly understand how it is used to restructure learning to enhance learner performance. Gardner and colleagues (2018) reviewed literature on national frameworks particularly STEM and ICT education at secondary level in Sub-Saharan Africa. According to the scholars, the application of STEM and ICT is not only associated with improved education performance, but also economic growth and global competitiveness (Gardner et al., 2018). The use of STEM and ICT information and expertise is aligned with human development and sustainable growth visions. However, there are variations in the degree to when human development and sustainable development visions in different countries. Besides, there are gaps between policies and practice.

The Ministry of Education and the TSC in Kenya emphasize training principals before teachers (Rana & Rana, 2020). The purpose of doing this is to ensure school managers lead by example in ICT integration. However, there is no information about principals' involvement in ICT policy development, although principals' input is essential. The Kenyan government may allocate enough funding to promote ICT integration, but more is required to implement it in schools. There should be more sustainable mechanisms to inspire instructors to utilize ICT in pedagogy as Rana and Rana (2020) suggest. Despite such findings, the advocacy roles of principals have been overlooked, making ICT integration difficult. In the policy document on information communication and technology formulated by the MoE, the need to increase knowledge acquisition in societies where every individual has an opportunity to learn and engage with other. This is found

in the Sustainable Development Goals No 9, which also underscores the need for investing in ICT (Ministry of Education, 2021). The 2030 agenda advises all countries to build supply infrastructure, support inclusivity, and sustainable development of industries that facilitate originality in all countries. In Nairobi, Kenya, Kimuya and colleagues (2021) investigated the association linking instructors' perceptions of school managers' promotion of ICT in instruction and learners' educational outcomes in public secondary institutions. They revealed that there exist considerable statistical correlation linking trainers' views of school heads' promotion of ICT in instructional strategy and learners' educational achievements. There is a clear indication that the aspect of leadership cannot be underscored.

In Tharaka Nithi, Kinyua (2021) sought to discuss challenges related to OER, which are encountered by both teachers and learners. The scholar has revealed that the utilization of OER is about 3%. The low percentage is attributed to unawareness about OER or unconstructive mind-set towards them, inadequate ICT skills, and insufficient resources in the school environment. Kinyua (2021) has noted that when the trainer is untrained, there is the likelihood of poor utilization of OER not only in the county, but also in the entire county. This is to imply that when principals lack ICT knowledge and skills, academic performance is likely to be adversely affected. In this view, principals should be trained to act as role models to implement the policy of ICT integration in schools.

2.1.4 Principals' Overall Supervision on ICT Integration

The administration of secondary institutions has a fundamental place in the instructional systems of many nations across the globe. Without proper supervision, their operations will falter at all levels. Highly sufficient supervision and monitoring designs are crucial to effective ICT integration. In Thailand, Apsorn (2019) investigated the ICT leadership of school administrators. Among the components of ICT leadership identified included, but was not limited to developing a

vision, creating an ICT culture in schools, supervision and monitoring data security and update for to make informed decisions and handle issues when they arise amicably. Sun and Gao (2019) did almost a similar study in Chinese middle-high schools to explore responsibilities of school heads and instructors in ICT integration. They revealed that ICT leadership, which forms parts of supervision, is critical to teaching reforms. These findings contradict those of Raman and colleagues (2019) who conducted a study to establish principals' technological headship and its impacts on educators' ICT infusion on 21st-century institutions. This investigation did not find any momentous link between school managers' ICT leadership and educators' technology incorporation in the preferred institutions. Despite the divergent views of different scholars, it is not possible to dispute principals' supervisory duty in utilizing technology.

Guvhu (2018) investigated the under-researched relationship between principals' leadership, i.e., supervisory role and booming execution of technology policy in Zimbabwe. The scholar examined the roles of the principals while investigating the facts, viewpoints, and practices of coordinators in ICT. The findings from the investigation revealed that many school principals had little pedagogical knowledge about ICT integration. Besides, a number of them preferred pedagogical leadership to transformational leadership. The principals' preference can be attributed to a negative attitude towards ICT integration or ignorance, something, this proposal will seek to establish. Just as Navaridas-Nalda and colleagues (2020) suggest, principals' leadership practices are capable of facilitating a digital culture.

School heads can only supervise ICT policy if they understand it. Equipping them with the relevant knowledge and skills is essential in performing their roles. Mutwiri and colleagues (2017) researched to find out the responsibility of school heads in technology strategy formulation in public middle level institutions from Meru County, Kenya. The authors have appreciated the role ICT has played in education. The researchers found that many schools lack comprehensive ICT

policy on how technology should be integrated in the instructional process and the roles of principals are not explicitly highlighted. They have recommended the introduction of both in-service and pre-service training programs for principals on diverse aspects of pedagogical skills for successful transformation of ICT policy on instruction at school levels.

In Chiakariga Sub-County, Tharaka Nithi County, Kenya, ICT integration in schools is below expectations. Many secondary schools' heads are ICT incompetent and thus, cannot supervise ICT incorporation. The MoE and the TSC train instructors other than the principals to handle ICT activities, making it hard for them to perform the supervisory role effectively. A few who have basic computer skills utilize them. Mbugua and colleagues (2013) investigated the reaction of school heads towards application of technology in instructional process in public secondary institutions in Tharaka Nithi County, Kenya. They found that principals exhibited positive reactions towards ICT used in the learning process.

2.1.5 Principals' Support on teachers' ICT Capacity Building

Instructors should update their competence profiles to handle 21st-century challenges. It is important to underscore that teaching approaches should be enhanced and so do the competencies for teachers. In reaction to technical dynamics in learning situations, instructors, as professionals, should be equipped to tackle the challenges of instruction using technology and uphold an excellent grasp of the theme content. As stated earlier, technology-incorporated training has advanced, and its demand has increased in instruction. Joo and colleagues (2018) investigated core factors that influence preservice instructors' plan to utilize ICT tools. They evaluated technology aspects, such as TPACK, and self-efficacy, recognized easiness of use, and observed usefulness for preservice teachers who purpose to employ ICT founded on the Technology Acceptance Model (TAM). According to the researchers, preservice instructors' TPACK significantly affect the professed ease of employing ICT.

Hermawan and associates (2018) from Indonesia have identified gaps in human resource capacity building and a lack of ICT-competent teachers as major problems in many institutions. It is the duty of the institutional heads to develop a motivated ICT physical and human infrastructure. Although many schools have adequate physical infrastructure for ICT, they have no incentives to motivate teachers. In this view, principals must mobilize parents and other sources of ICT funds to facilitate teachers to attend in-service training and procure laptops for them. Where physical resources are enough and human resource lacks the necessary skills, ICT integration becomes difficult (Hermawan et al., 2018). Thus, scholars have recommended that principals should ensure the human resource is well motivated and successful in ICT integration.

Adamu and associates (2017) from Niger State sought to establish approaches for technology capacity building of personnel of learning institutions using school heads from twenty-nine randomly selected schools. They found that the strategies were good for capacity building for teachers, but ICT facilities were unavailable. Li and collaborators (2019) have examined the influence of specialized growth activities on instructor-stage aspects that are imperative to ICT incorporation in institutions in Mongolia. The factors identified have been advanced for many years through specialized training activities. The authors have identified benefits, such as professional competence in ICT use, autonomy to innovate, collaboration for ICT infusion, and being recognized as a professional.

In Rift Valley Kenya, Kipnetich and colleagues (2022) conducted research to determine the effectiveness of staff growth on the incorporation of the CBET strategic approach in secondary schools. The researchers revealed a strong effect between teachers' capacity building and infusion of CBET in secondary schools. Evidently, the more the staff is developed, the incorporation of CBET in these schools augmented. This is similar to the sub-county under study because teachers who have attended ICT training tend to be more useful and competent in ICT use.

2.1.6 ICT Integration and Academic Performance

ICT has become a critical source of innovation and advancement in many sectors globally. In education, its use has become a vital part of the education process at all levels of learning. Many governments are investing millions of dollars to introduce e-learning in their education systems with the aim of improving academic performance. In the USA, Kim (2018) sought to examine the potential of ICT in providing eminence instructions for all, focusing on settler youths in the USA. The researcher explored how the accessibility of ICT influenced two categories of technology use for instructive functions, i.e., standard and particular. The study revealed that accessible ICT influences definite use positively both directly, indirectly, and overall impacts on immigrant youths' academic performance outcomes. On the other hand, the application of generic ICT had nonsignificant adverse effects.

ICT integration is associated with diverse benefits in all aspects of education. Increased flexibility, interactivity, and accessibility for involving students are some of the benefits. In South Africa, Dlamini and Mbatha (2018) explored the conversation of ICT instructor professional growth requirements. They revealed the crucial role of in-service for teachers as well as the significance of ICT in running the learning institutions. According to the writers, the school management can use technology tools to plan, control, budget, and general administration of the school.

In Kenya, the MoE in conjunction with the TSC uses ICT to manage education and the teaching workforce. In fact, the two views ICT as a critical instrument that promotes gaining, utilizing and managing of crucial data that is essential in decision-making. Karanja and colleagues (2017, p.1) have assessed “the influence of ICT integration on human resource management in Kenyan public institutions of higher learning”. The findings showed that the influence was on HR managerial aspects, such as payroll administration and workers' record management. However, it

revealed that ICT use was minimal in strategic utilization, such as hiring and selection of staff, training and improvement, and performance supervision. Although these findings demonstrate that ICT was not mainly used in some aspects of HR management, currently, it is being utilized in almost all aspects of HR management.

In Tharaka Nithi County, Kenya, Mbugua and colleagues (2013) sought to find out how school principals reacted to ICT application in the instructional process. The researchers revealed that school heads reacted positively towards computer application in teaching and learning process.

2.2 Critical Review and Research Gap

Based on reviewed literature, it is explicit that many research gaps exist. For instance, on principals' ICT integration strategies, in a study conducted by Agyei (2021) in six sub-Saharan African countries, Kenya included to investigate whether teachers can infuse ICT in teaching after capacity building, the researcher found that teachers were contented with the content and processes they were trained, but the scholar did not demonstrate the essential conditions for the transfer of the learnt knowledge to the school level, where academic performance is realized. This means principals lack knowledge about ICT integration, and eventually cannot promote its integration. The literature reviewed has not adequately demonstrated the principals' strategic roles in ICT integration.

Concerning principals' provision of ICT materials, Nang'unda (2019) has generalized principals' roles in providing ICT materials, implying the investigator has not outlined the specific roles of principals in ICT integration leaving a gap for further studies of investigating particular responsibilities of the school heads with regard to ICT leadership and academic performance. In a similar study, Julius (2019) sought to ascertain the influence of CAI on school performance. Apart from revealing that students who used CAI performed better, he discovered that the ICT resources were inadequate, necessitating further study to establish whether school managers are aware that it

is one of their responsibilities to source ICT materials to improve academic performance in learning institutions.

Regarding principals' advocacy roles, the investigations done by many scholars have not given clear advocacy roles of school heads. For example, Kimuya and colleagues (2021) did an investigation to establish the relationship between instructors' perceptions of school managers and the promotion of ICT in learning institutions as well as in academic performance in public secondary institutions. Although they emphasized the role of leadership, they neither gave the advocacy role nor did they highlight advocacy strategies, leaving a gap for future studies. Kinyua (2021) also did an investigation in Tharaka Nithi County to examine challenges of implementing OER. He discovered that most of the principals are untrained, implying that when the trainer is untrained, it is not possible to play the advocacy roles, calling for further studies.

On principals' supervisory roles, it is possible that many of them in the sub-county under study do not understand that they have a duty to ensure ICT is integrated into instructional process. As mentioned earlier, the Ministry of Education and TSC train teachers who are not principals as ICT champions. This implies that most principals are ICT illiterate, and their roles are not clearly defined as revealed by Mutwiri and colleagues (2017). The case is similar to principals' support on human resource capacity building. Kipngetch and colleagues (2022) have asserted that capacity building is essential in the integration of the CBET approach in TVET institutions. However, they have not defined the role of principals in supporting teachers' in capacity building.

2.3 Theoretical Framework

The investigation was based on two theories, i.e., systems theory and behavioral management theory

2.3.1 Systems Theory

The research was anchored on the systems theory that was developed by Luhmann in 2004 (Friedman & Allen, 2011). It was later developed by Norbert Wiener in 1948 through his development in cybernetics. Norbert underscores the role of communication and feedback in maintaining system stability and effectiveness (Friedman & Allen, 2011). This is critical to this study as principals cannot promote ICT integration or improve academic performance in their institutions without using effective communication and feedback to the respective parties. As noted earlier, the theory uses a strategic approach to organizations and likens them to organisms with interdependent parts, each with defined roles and interrelated tasks. All components of the firms are interlinked and co-dependent. In the context of public secondary schools, systems theory suggests that these institutions operate as a complex system where different parts, i.e., students, teachers, and administrative staff, as well as broader community interact to achieve common educational goals. Schools, like other organizations, are open systems. They connect with the world around them and keep evolving. This theory suggests that schools, as organizations, rely on inputs from their environment. In simpler terms, students come into school with various personal beliefs, aims and dreams. Contact with school heads, teachers, and fellow students can reshape these experiences, transforming the students.

This theory talks about how heads of schools and their teams work together. They know their goals, the best plans to reach them, and how to inspire their staff to do their best. The research found something important. School heads around the world might be good at their jobs without using certain theories. But, those who use theories in their work often run their schools better. They can improve both students' performance and the school's overall goals. Therefore, systems theory was pertinent in this research for the reason that to enhance ICT integration in schools, principals should understand the crucial responsibility they have in their schools if they are to improve academic outcomes in the schools that they manage. The principals need to adopt strategies that are

geared towards infusing ICT in instructional process in secondary institutions to promote academic excellence among all students in schools.

2.3.2 Behavioral Management Theory

This research was also be anchored on the Behavioral management premises formulated by John B. Watson in the early 20th century (Smith, 2020). Later, B.F Skinner tested Watson theories in 1938. Behaviorists hold that learning is a perfunctory process where stimulus is associated with response, and eventually bring out new behavior. It emphasizes the significance of reinforcement and condition in shaping behavior. This theory posits that behavior can be learned and modified through the systematic application of rewards and punishment (Brieger, et al., 2020). Besides, the theory proposes that behavior is influenced by outcome that follows it. Positive reinforcement such as reward and praise augments the chances that behavior will be repeated. On the other hand, negative reinforcement which involves removal of unfavorable outcome also strengthen behavior. On the other hand, punishment, either by presenting an adverse outcome or removing a desirable one aims to decrease the occurrence of undesirable behavior (Brieger, et al., 2020). Additionally, the need for practice to strengthen the association and promote effectiveness and efficiency is underscored.

This theory is appropriate to the current investigations in the sense that learning experiences need to be enjoyable if understanding is promoted. It is important to note that while using technology for teaching, teachers should be keen to identify a device that wears off. This is because learners are likely to lose interest unless the content taught is interesting. Notably, students are excited when they are taught from smart computer laboratories and computers; but to sustain the interest, the instructor should edify in a manner that they enjoy. In this regard, principals should ensure ICT infrastructure is well maintained to make learners enjoy what they are taught and improve their performance. Computers can help us learn, just like Skinner's idea about rewards.

Instead of just teaching, computers can help students understand better and tell them how they're doing. This helps make sure students continue doing the right thing. Feedback straight away from computer tools helps students to not forget what they've just learned. This in turn leads to improved academic performance. Learning is a process that requires readiness in terms of maturity and previous knowledge. This implies that teachers should develop ICT content while considering academic background of the learners.

2.4 The Conceptual Framework

In this research, the conceptual framework was grounded on school managers' ICT strategies, such as principals' provision of ICT materials, principals' advocacy for ICT integration, principals' overall supervision of ICT integration, and principals' support on teachers' capacity building, which will constitute independent variables while academic performance was the dependent variable.

Independent variables (Principals' ICT Integration Strategies)

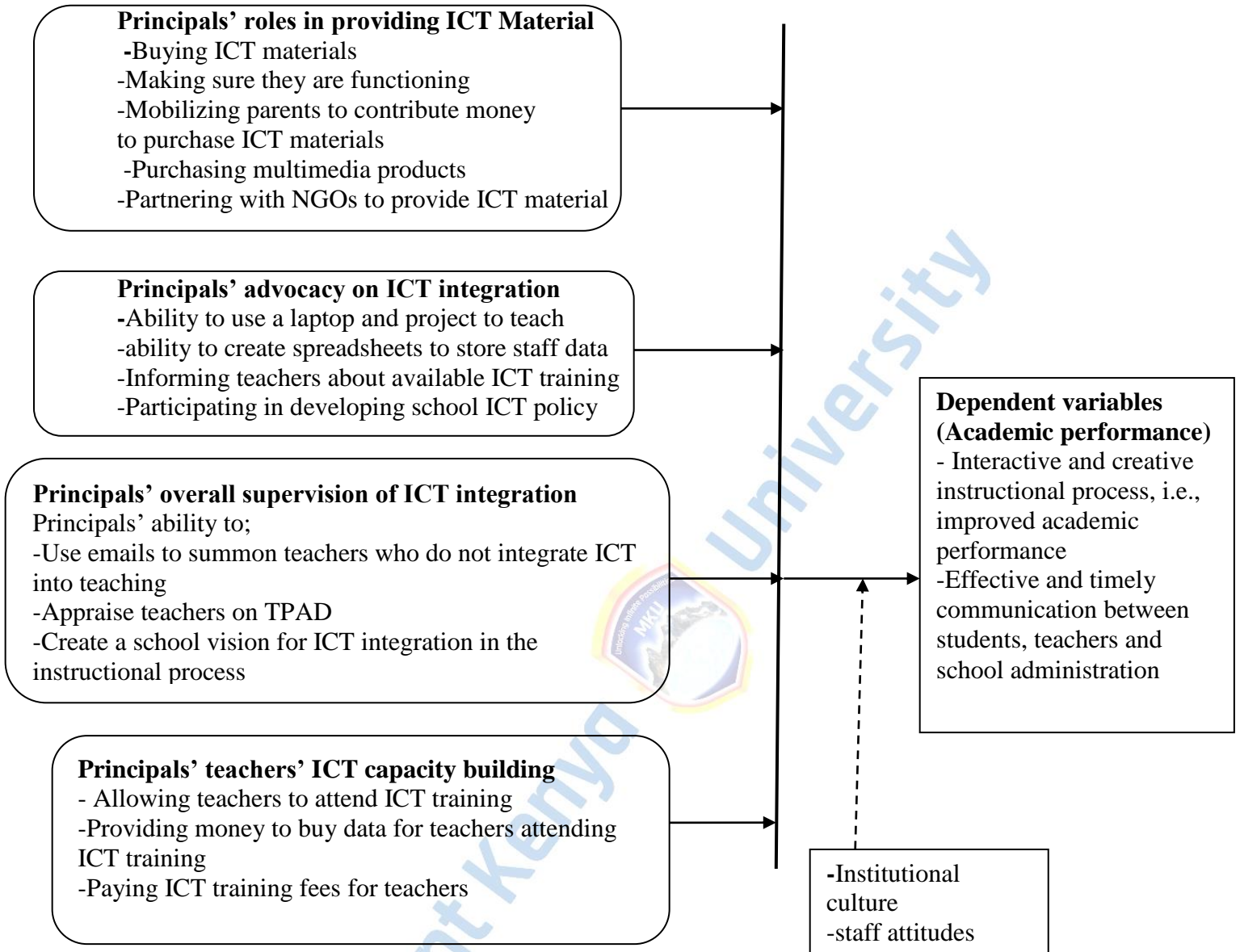


Figure 1: Conceptual Framework of the Current Study

Source: Researcher, 2024

Intervening variables

2.5 Summary of the Literature Review

The reviewed literature has concentrated on the concept of principals' ICT integration strategies, principals' provision of ICT materials, principals' advocacy roles, principals' supervisory roles, and their support on teachers' capacity building. Despite the diverse literature reviewed, it is not explicit how principals' ICT integration strategies influence academic performance, making it necessary to carry out this study.



CHAPTER THREE: RESEARCH METHODOLOGY AND DESIGN

3.0 Introduction

This chapter discusses the research methodology that the researcher utilized to conduct the investigation. It concentrates on the research design, where the investigation was conducted (location), target populace, sample size, sampling methods, investigation tools, testing of research tools, dependability and legitimacy, procedures for collecting data, how data was analyzed, and ethical considerations.

3.1 Research Methodology

To present inclusive information about the issue under investigation, the investigator employed a mixed approach method, i.e., qualitative and quantitative methods to gather information. This approach was preferred for the reason that it offers a more inclusive understanding of questions used in the investigation. Besides, it helped the researcher to get valid and reliable findings. The quantitative method involved asking queries, collecting quantifiable data from a large populace of respondents, examining them by use of figures, as well as conducting inquest in an impartial, purposeful manner. Questionnaires were utilized to collect quantitative data because of their flexibility and reliability (Dalati & Marx Gómez, 2018). The researcher collected qualitative data using an interview schedule. The investigator depended on the views of respondents. Here, broad, all-purpose questions were asked, and data comprising mainly words will be obtained. Data was described and analyzed in line with the objectives.

3.2 Research Design

The investigator employed a descriptive design approach to execute the qualitative and quantitative methods. According to Fleming and Zegwaard (2018), descriptive research design provides valuable insights and informs future research. Besides, the approach promoted data

scrutiny that is more probable to remain true to participating populace's accounts and promote transparency in researchers' own interpretations. Aside from that, this approach permitted the investigator to use questionnaires as well as interviews, implying a huge number of respondents can respond to them within a short period.

In this study, descriptive design was useful in asking questions about principals' provision of ICT materials, principals' advocacy roles in ICT, Principals' supervisory roles, and their support on teachers' capacity building on ICT.

3.3 Target Population

Chiakariga Sub-County has 9 public secondary institutions. Therefore, the target populace was 2555 respondents, comprising of 1 sub-county director of education, 9 school heads, 155 instructors, and 2390 learners in public secondary institutions as shown in table 2 below.

Table 2: Target Population of the Study

Categories	Target Population
Sub-County Director	1
Principals	9
Teachers	155
Students	2390
Total	2555

Source: Records from Chiakariga Sub-county (2024)

3.4 Sampling Design

3.4.1 Sample Size

Yamane's Formula was utilized by the investigator to establish the sample size. The procedure that was followed was:

$$N_0 = \frac{N}{1 + N(e^2)}$$

Where, N_0 =expected sample size at 95% confidence interval

N =Target Population

e=Confidence level of 5%

Therefore, the desired sample size will be obtained by:

$$N_0 = 2556 / 1 + 2555(0.05)^2$$

$N_0 = 346$ Respondents

3.4.2 Sampling Technique

Purposive sampling was utilized to select schools where the study will be conducted. Six principals were selected from the selected schools using purpose sampling considering public secondary schools, which have been utilizing ICT resources for the last five years. According to Fleming and Zegwaard (2018), purposive sampling permits the researcher to get a lot of information from the data they have collected, allowing them to describe the crucial impacts of their findings on the population. The researcher utilized simple random sampling to choose 110 teachers from school identified to avoid partiality. Simple random sampling was also used to choose 110 instructors and 229 students based on the population of the learning institution. Thus, the researcher had a sample size of 1 sub-county director, 6 school heads and 110 instructors, and 229 students.

Table 3: Sampling Grid

Categories	Target Population	Sample Size	Sampling Techniques
Sub-County Director	1	1	Purposive sampling
Principals	9	6	Purposive Sampling
Learners	2390	229	Simple random sampling
Teachers	155	110	Simple random Sampling
Total	2556	346	

3.5 Data Collection Methods

This section outlines the data collection tools, justifying why each was used. The instruments employed in the study are attached in the appendices.

3.5.1 Research Instruments

To obtain data from the instructors and students, researcher utilized questionnaires and interview schedule to obtain data from sub-county director, and school managers about definite set objectives. The investigator devised questionnaires in such a way that there was demographic information about the teachers and another portion, which incorporated Likert-type questions with information aligning with the objectives of the study. Patel and Patel (2019, p. 50) define a “questionnaire as a set of items that are employed in collecting data from respondents about their attitudes, experiences or opinions, and can be used to collect both quantitative and qualitative data”. Thus, it was the best tool for collecting data information from the respondents in the study.

Interviews with interrogation guides and questions related to the research objectives were used to get data from the school heads. The choice of the interviews is based on the assertion of Adeoye, Olatunde, and Olenik (2021) who state that they give interviewers access to the thoughts of interviewees and enable the researchers to establish what they like and dislike as well as what they think. Interviews were critical to this assessment because the assessor was allowed to ask inquisitive and additional questions, and establish good relationship, obtain reliable and valid responses.

3.5.2 Administration of Questionnaires and interview guides

The researcher administered questionnaires randomly to the students as well as teachers of the selected schools.

This was done after the piloting of the study, which comprised of 10% of the sample population as advocated by Patel and Patel (2019). The researcher-administered method was used to administer questionnaires to teachers and students. Besides, it was used to conduct interviews with the sub-

county director and the selected principals. This method was selected to conduct interviews because the researcher could ask clarifying questions and/or follow-up questions.

3.5.3 Reliability and Validity

Credibility is used to establish whether the results are authentic by depending more on value of the work and not quantity as Thomas (2021) asserts. Triangulation of data collected by use of multiple methods was employed to establish the authenticity of the tools. This approach was helpful in advancing the internal validity of the tools. After the interviews, data collected was transcribed and sent back to the interviewees for checking. Data was reviewed by specialists in the area under investigation. The analyst with the expertise in the field evaluated and inquired about procedures and explanation. Their observations and recommendations were utilized to amend the tools. To promote quantitative legitimacy of the study tools, the investigator noted down statement grounded on the stated objectives of the investigation.

Consistency of the tools refers to the degree to which a study tool produces reliable outcomes or data after repeated tryouts (Fleming & Zegwaard, 2018). They assert that dependability establishes the study's results as consistent and repeatable, thus researchers can verify their findings and align them with the raw data collected. To achieve this, the researcher evaluated the steadiness of the answers on the test survey with the help of supervisors. The study instruments were reviewed for appropriateness of the items, seeking to establish the ones that are not clear. The questions were rephrased to make sure that participants understand them. Pearson's Product Moment Correlation Method was employed to ascertain the dependability of coefficient based on the findings of the testing study. The investigator got consistency coefficient value of $r > 0.75$, this implied strong internal dependability.

3.6 Data Analysis Procedures

On the first objective, which is to determine the influence of principals' provision of ICT resources on academic performance in public secondary institutions in Chiakariga sub-county Tharaka Nithi County, Kenya, the investigator examined qualitative data obtained from interviews through thematically splitting crucial data into phrases or sentences that depict a single distinct notion. The researcher used thematic analysis because it is helpful in getting a deeper comprehension of the topic under investigation from the experiences of the respondents (Wiltshire & Ronkainen, 2021). Besides, it has been considered because it allows flexibility in data interpretation and large sets of data can be assessed by sorting them into broad themes (Wiltshire & Ronkainen, 2021).

The researcher used codes and labels for the responses to the closed-ended questions. The researcher chose codes and labels because they can easily be re-labeled. According Deterding and Waters (2021), codes can be re-labeled, amalgamated or split easily, implying the researcher is capable of can explore many ways of understanding similar data. Additionally, this type of analysis does not limit the researcher on the number of times she is able to work with data from questionnaires.

Quantitative data was analyzed inferentially by use of Pearson's Product Moment Correlation in Statistical Packages for Social Science (SPSS version 28). Pearson's Product Moment Correlation was chosen because of its many merits. Evidently, it is not only useful in identifying the presence or absence of the relationship between variables, but also establishes the degree of relationship (Deng et al., 2021). The method also helped the researcher to ascertain whether the correlation between the variables is constructive or unconstructive. According to Deng and colleagues (2021), the method is helpful in estimating the value of dependent variable in relation to the value of independent variable through regression equations. The SPSS was selected to analyze data because of its usefulness in importing, cleaning, and organizing large data set.

Qualitative data about the second objective, i.e., To ascertain the effect of principals' advocacy for ICT integration on academic performance in public secondary schools in Chiakariga sub-county Tharaka Nithi County, Kenya was also thematically analyzed. Besides, codes and labels for the responses to the closed-ended questions. The researcher chose codes and labels because they can easily be re-labeled. Quantitative data about the same objective were analyzed inferentially by use of Pearson's Product Moment Correlation in Statistical Packages for Social Science (SPSS version 28). Pearson's Product Moment Correlation was chosen because of its many merits. The merits had been mentioned earlier.

On the third objective, i.e., to investigate how principals' overall supervision of ICT integration on academic affect performance in public secondary schools in Chiakariga Sub-County Tharaka Nithi County, Kenya. Similar methods of analysis for other objectives were used. Thus, qualitative data were thematically analyzed. Apart from thematic analysis, codes and labels for the responses to the closed-ended questions were used. On the other hand, quantitative data was analyzed inferentially by use of Pearson's Product Moment Correlation in Statistical Packages for Social Science (SPSS version 28). As stated earlier, this method is useful in establishing relationship between variables and helped the researcher to ascertain whether the relationship between the variables is positive or negative.

Finally, the last objective, which is to assess the impact of principals' support on teachers ICT capacity building on academic performance in public secondary schools in Chiakariga Sub-County Tharaka Nithi County, Kenya, thematic analysis was done on qualitative data in addition to use of codes and labels. Pearson's Product Moment Correlation in Statistical Packages for Social Science (SPSS version 28) was used to analyze quantitative data. This is because it gives relationship between variables and it is helpful in estimating the value of dependent variable in relation to the value of independent variable through regression equations. Above all, the SPSS was

selected to analyze data because of its usefulness in importing, cleaning, and organizing large data set.

The investigator used tables and graphs to present the findings because of their ability to summarize enormous data as asserted by Dong and colleagues (2019). Tables and graphs were selected because of the many advantages associated with them. Notably, tables are useful in condensing data, promoting easy comparison, thus, reduce visual confusion. Besides, they minimize the need for detailed explanations since data are clearly displayed on them. Moreover, they can be designed in such a way that they help in vertical comparison of numerical information by aligning columns and explicitly identifying statistical significance (Dong et al., 2019). Tables and graphs promote readability, making it uncomplicated for readers to grip the content quickly.

3.7 Ethical Considerations

Fleming and Zegwaard (2018, pp. 210-211) define “ethical considerations in research as a set of standards that outlines how research plans and practices should be carried out. These standards include participation without coercion, informed consent, obscenity, privacy, possible harm, and communicating findings”. For instance, in my study, the following are the major ethical considerations:

3.7.1 Confidentiality and privacy

The investigator guaranteed the respondents in the research that no personal data will be shared with a third party by anybody.

3.7.2 Anonymity

Identifying information about the respondents and institutions shall not be divulged in any written form or other forms of communiqué.

3.7.3 Informed Consent

The investigator explained the techniques for collecting data to the respondents so that they will willingly participate. Besides, the nature and aim of the study was clarified. Finally, the investigator sought informed consent from the respondents by giving them informed consent forms to sign.

3.7.4 Youth (Students') Assent

Since most of the learners in public secondary schools are between ages 13-17, they will assign youth assent form. This form will allow the students to indicate their agreement to participate in research, although they are not legally able to give informed consent. It shows that the youth is willing to participate in the investigation.

3.7.5 Storage of Data Collected

Filing of unanalyzed data was done for future reference. Later, computer-generated print-outs were filed after data analysis. The investigator stored soft copies in storage devices, such as CDs and flash diskettes.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

In this chapter, the results and findings from the research study on the influence of principals' ICT integration strategies on academic performance in public secondary schools in Chiakariga Sub-County, Tharaka Nithi County, are presented. The chapter is organized around the study's objectives and aims to provide an interpretation of the data collected through interviews and questionnaires. The specific objectives were:

1. To determine the influence of principals' provision of ICT materials on academic performance in public secondary schools in Chiakariga sub-county Tharaka Nithi County, Kenya.
2. To ascertain the effect of principals' advocacy for ICT integration on academic performance in public secondary schools in Chiakariga sub-county Tharaka Nithi County, Kenya
3. To investigate how principals' overall supervision of ICT integration on academic affect performance in public secondary schools in Chiakariga Sub-County Tharaka Nithi County, Kenya.
4. To assess the impact of principals' support on teachers ICT capacity building on academic performance in public secondary schools in Chiakariga Sub-County Tharaka Nithi County, Kenya.

4.2 Response Rate

Out of 229 students and 110 teachers who were given questionnaires, 210 students and 100 teachers responded, representing a response rate of 91.7% and 90.9%, respectively. In addition, 6 school heads and 1 sub-county director were successfully interviewed, reflecting a 100% response

rate from the school leadership. The results are provided in table 4.

Table 4: Response Rate

Respondents	Given questionnaires	Returned questionnaires	Response rate
Students	229	210	91.7%
Teachers	110	100	90.9%
Sub-county directors	1	1	100%
School heads	6	6	100%

4.3 Demographic Information of Respondents

The demographic characteristic of the respondents that was evaluated was sex, education level, and professional experience for the teachers, school heads and sub-county director. The table 5 provides the gender of the participants.

Table 5: Gender of the Respondents

Participants	Frequency	Percentage
Students :		
Male	87	41.43%
Female	123	58.57%
Teachers:		
Male	44	44.00%
Female	56	56.00%
School heads:		
Male	4	66.67%
Female	2	33.33%
Sub-county director:		
Male	1	100%
Female	0	0%

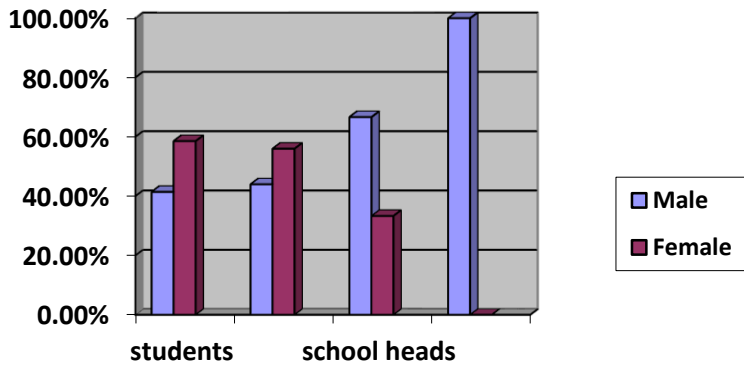


Figure 2: Gender of Participants

Gender distribution of participants in investigation reveals notable patterns across the different categories. Among the student participants, females constituted a larger portion, making up 58.57% of the respondents, while males represented 41.43%. This indicates a slight gender imbalance in favor of female students. In contrast, the gender distribution among teachers was more balanced, with 56% of the respondents being female and 44% being male. This suggests a near-equal representation of male and female teachers in the schools sampled.

When examining school heads, there was a clear male majority, with 66.67% of the positions occupied by males and only 33.33% by females. This reflects a gender disparity in leadership roles within the schools, with males holding the majority of principal positions. Furthermore, the sub-county director was male, representing 100% of this category, as no female sub-county directors were identified in the study.

These findings highlight some gender disparities, particularly in leadership positions, where males are more dominant, while females are more represented among students and fairly balanced among teachers. This information may be helpful in understanding the dynamics of technology integration strategies in learning institutions and how gender might influence the implementation of these strategies.

Besides, the researcher aimed at finding out educational qualifications of instructors, school heads, and the sub-county director. The educational qualifications were categorized as diploma, degree, and post-graduate qualifications. The figure 3 below provides the educational qualifications of teachers, school heads and sub-county director.

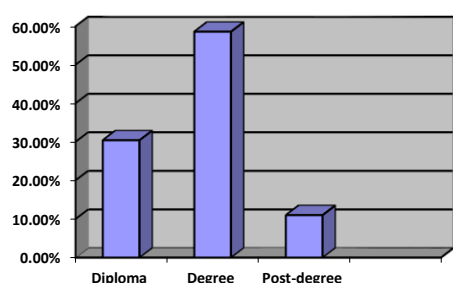


Figure 3: Education qualifications

From the Figure 3 above it can be deduced that 58.6% of the teachers, school heads, and sub-county director held a degree, 30.4% had diplomas, and 1% had post-graduate qualifications. Most school heads had managed schools for more than 10 years.

4.4 Provision of ICT Materials and Academic Performance

The first goal was to establish whether a principal giving out tech stuff affects how students do in school. Now, we'll talk about what we found - whether having these tech items and using them made any difference to student results.

4.4.1 Availability of ICT Resources

Using data from the student and teacher questionnaires, present how often schools access ICT materials such as computers, projectors, and internet facilities. The availability ICT resources in schools are critical for enhancing learning experience, promoting digital literacy, and preparing students for the world that is driven by technology. The extent of ICT resources available in schools can vary considerably depending on aspects such as location, government support,

infrastructure, and school policies. The table 6 below demonstrates the availability of ICT materials in educational institutions.

Table 6: Availability of ICT resources

Availability of ICT resources		
ICT resources	Frequency (f)	Percentage (%)
Computer lab	45	14.52%
Electricity	95	30.65%
Computer / Laptops	72	23.23%
Projectors	17	5.48%
Internet / WiFi	52	16.77%
Storage devices	29	9.35%
Total	310	100

The availability of technology materials in the learning institutions sampled shows significant variation. Electricity was the most widely available resource, with 30.65% of respondents indicating that their schools had reliable access to it. This is crucial as electricity is a fundamental requirement for operating other ICT tools. Computers and laptops were available in 23.23% of the schools, while internet/WiFi connectivity was available in 16.77% of the schools. However, computer labs were less common, with only 14.52% of the schools having such facilities, suggesting limited infrastructure for students to access ICT tools for learning. These findings are similar to those of Agasisti and colleagues (2023) who noted that the availability of ICT materials vary from one institution to the other, a sign that such differences may influence academic performance.

Projectors and storage devices were the least available resources, with projectors being present in just 5.48% of the schools and storage devices in 9.35%. This indicates a substantial gap in multimedia teaching tools, which are essential for enhancing interactive and effective learning environments. Overall, while some ICT resources are moderately available, the limited presence of

crucial tools like projectors and internet access may hinder the full integration of ICT in instruction and knowledge acquisition and eventually downgrade educational performance. Although the investigation reveals limited presence of crucial tools, a few schools that have such materials have improved academic outcome as revealed by (Tigere, 2020) in the literature review.

4.4.2 Impact of ICT Resources on Academic Performance

Effective principals' ICT integration strategies cannot be successful, without adequate ICT resources and assessing how the ICT materials impact academic performance. Indeed, the impact of technology materials has been widely discussed in this study, with evidence showing both positive and negative outcomes, depending on various factors. Students and teachers were asked about how they perceive these principals' ICT strategies influence on academic performance. Table 7 below gives the results on positive impacts.

Table 7: Positive Impact of ICT resources on Academic performance

Positive Impact		
Positive impact	Frequency (f)	Percentage (%)
Enhance access to information	52	16.77%
Makes more engaging environment	83	30.65%
Enables personalized learning	64	26.77%
Improves communication	33	10.65%
Development of digital literacy	46	14.84%
Efficient assessment and feedback	32	10.32%
Total	310	100

The positive impact of ICT resources on school performance was felt across various aspects of learning. The most frequently cited benefit, with 30.65% of respondents, was that ICT makes the learning environment more engaging, suggesting that interactive and multimedia-based instruction plays a key role in capturing students' interest and enhancing their motivation to learn. This is also revealed by Raman and associates (2019) who posit that ICT promotes interactive learning.

Personalized learning, another major advantage, was recognized by 26.77% of respondents, indicating that ICT tools enable tailored learning experiences that meet individual student needs.

Additionally, 16.77% of respondents highlighted enhanced access to information as a key benefit, showing how ICT provides students with a wealth of educational resources beyond traditional textbooks. The development of digital literacy, noted by 14.84% of respondents, underscores how critical is ICT in preparing students for digital age. This proposition is advocated by Sun and Gao (2019) who assert that students should be prepared for digital revolution.

Moreover, ICT positively impacted communication and assessment processes, although to a lesser extent. Improved communication between students, teachers, and peers was recognized by 10.65% of respondents, while 10.32% pointed to efficient assessment and feedback mechanisms facilitated by ICT tools. Overall, the findings suggest that ICT integration contributes to various dimensions of academic performance, particularly in creating engaging, personalized, and resource-rich learning environments. Table 8 below provides the negative impact of digital materials on academic outcomes.

Table 8: Negative Impact of ICT resources on Academic performance

Negative impact	Frequency (f)	Percentage (%)
Distraction and misuse	107	34.52%
Over-reliance on technology	63	20.32%
Digital divide	54	17.42%
Lack of proper training	66	21.29%
Technical issues	20	6.45%
Total	310	100

The most frequently cited negative impact of ICT materials on educational performance was distraction as well as misuse, with 34.52% of respondents indicating that students often use technology for non-educational purposes, which hampers their focus during learning activities.

This suggests that while ICT can enhance learning, it also introduces potential distractions if not properly managed. Lack of proper training was another significant issue, with 21.29% of respondents pointing to the fact that both students and teachers may struggle with effectively using ICT tools due to insufficient training. This finding aligns with that of Kim (2018) who note training is key to flourishing of digitalization of learning in schools. Consequently, this is likely to limit the benefits of ICT integration and hinder its impact on academic performance.

Over-reliance on technology was cited by 20.32% of respondents, reflecting concerns that students might become too dependent on digital tools, potentially reducing their problem-solving skills or engagement with traditional learning methods. The digital divide, affecting 17.42% of respondents, highlights disparities in access to ICT resources, which can create inequalities in learning opportunities between different student groups (Kim, 2018). Finally, technical issues were noted by 6.45% of respondents as a problem, indicating that hardware or software malfunctions can disrupt the learning process and negatively affect academic performance.

Overall, while ICT integration brings many positive outcomes, these findings indicate that careful management and adequate training are necessary to mitigate potential negative effects on student performance.

4.5 Principals' Advocacy for ICT Integration and Academic Performance

The second objective focused on principals' advocacy for ICT integration. The results presented here should describe how principals advocate for ICT and how these actions influence school performance.

4.5.1 Principals' ICT Advocacy Strategies

School heads play a vital role in advocating for and incorporating ICT within schools. Their leadership and strategies can significantly impact how well ICT is adopted by teachers, students, and the broader school community. The table 9 below provides findings on principals' ICT

advocacy strategies.

Table 9: Principals' ICT Advocacy Strategies

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	SD
Ensuring unlimited ICT resources are available and functioning has improved academic performance	41.25%	23.75%	20%	8.75%	6.25%	1.708333	1.47196014
Mobilizing parents contribute funds to purchase ICT resources avails more ICT resources, promoting its integration, and eventually promoting academic performance in school	33.75%	31.25%	25%	6.25%	3.75%	2.25	1.914854216
Purchasing multimedia products, promotes the security of school data, and instructional process in the school, leading to improved academic outcome	40%	35%	17.5%	5%	2.5%	1.5	1.190238071
Partnering with NGOs to enhance ICT integration has promoted ICT integration in the school, and eventually improved academic performance	42.5%	25%	20%	6.25%	6.25%	1.8177	1.5112

The results reveal that most of respondents believe that principals' advocacy for technology integration positively influences academic performance. For instance, 41.25% of respondents *sturdily agree* that ensuring the availability of ICT resources has improved academic outcomes, while an additional 23.75% *agree* with this statement. With an average of 1.71 and a standard deviation of 1.47, the data indicates that most respondents believe in the positive impact of

resource availability, though some variability exists in responses. Similarly, 40% of respondents *strongly agree* and 35% *agree* that purchasing multimedia products has enhanced data security and improved teaching and learning outcomes, reflected in the lowest mean of 1.50 and standard deviation of 1.19, indicating a stronger consensus on this advocacy strategy as supported by (Navaridas-Nalda et al., 2020)

However, there is less agreement about the role of mobilizing parents to contribute funds, as indicated by the higher mean (2.25) and standard deviation (1.91), suggesting mixed responses. This could reflect challenges in parental involvement or the effectiveness of resource allocation.

Finally, 42.5% of respondents *strongly agree* and 25% *agree* that partnering with NGOs has promoted ICT integration and improved academic performance, with a mean of 1.82 and a standard deviation of 1.51, again showing broad support for this strategy, though with some variation in perceptions. Overall, the data suggest that principals' advocacy efforts in ICT integration are viewed positively, particularly in areas of resource availability, multimedia use, and external partnerships. The results of the study on this objective is similar to those of Mngadi (2021) argues that principals should be viewed as the heart of the integration process. However, strategies that require more community engagement, such as mobilizing parent contributions, may face more challenges.

4.5.2 Impact of Advocacy on Academic Performance

Advocacy, especially in the realm of education, is critical in shaping studious performance by creating supportive environments, raising awareness, and driving changes that address educational needs and challenges. When school leaders, teachers, parents, and the communities advocate for better resources, policies, and practices, the overall academic outcomes tend to improve (Kimuya et al., 2021). The table below provides the findings on the impact of advocacy on academic performance.

Table 10: The Impact of Advocacy on Academic Performance

No.	Test Items	SA	A	U	D	SD
		5	4	3	2	1
1	In my secondary school, the principal's use of ICT to teach influences ICT integration in school, promoting improved academic performance	43.78%	27.43%	9.13%	12.63%	7.33%
2	In my secondary school, the principal's positive attitude towards ICT integration influences teachers' perception towards the same and eventually academic performance outcomes	38.42%	25.67%	9.13%	14.24%	12.54%
3	My principal has developed the school's ICT policy, which has helped to improve academic performance	24.76%	46.32%	7.92%	7.33%	13.67%
4	My principal has created the school's ICT vision, which guides teachers in teaching to improve academic performance.	27.12%	42.13%	17.91%	7.67%	5.17%

A significant portion of respondents (43.78%) *strongly agree* that their principal's utilization of technology in teaching has a positive impact on promoting ICT integration, thereby improving academic performance. Another 27.43% *agree*, indicating broad support for the principal's role in leading by example through ICT usage. However, 12.63% *disagree* and 7.33% *strongly disagree*, suggesting that a small group of respondents may not observe such positive impacts. Around 38.42% of respondents *strongly agree* and 25.67% *agree* that the principal's positive attitude toward ICT integration influences teachers' attitudes, which in turn enhances academic performance outcomes. Despite this, a notable 14.24% *disagree* and 12.54% *strongly disagree*, indicating that the principal's attitude alone may not be sufficient in all cases to influence performance significantly.

The creation of institutional ICT guidelines by principals demonstrate positive effects on academic performance, with 24.76% *strongly agreeing* and a notable 46.32% *agreeing* that such policies contribute to improved outcomes. However, 13.67% *strongly disagree*, suggesting that some respondents feel the policy has not been effective or adequately implemented in their context.

Principals who have developed a clear ICT vision for their schools are viewed positively by 27.12% of respondents who *strongly agree* and 42.13% who *agree* that this vision helps guide teachers and ultimately improve academic performance. Only a small percentage of respondents *disagree* (7.67%) or *strongly disagree* (5.17%), indicating general approval of having a long-term ICT integration strategy in schools. In summary, the findings indicate that principals' advocacy efforts, including their use of ICT, positive attitudes, policy development, and vision creation, are generally seen as having a positive impact on academic performance, just as Rana and Rana (2020) say. However, there are some variations in perceptions, particularly regarding the influence of attitudes and policies, suggesting that more consistent or broader implementation might be necessary for universal improvement.

4.6 Principals' Supervision of ICT Integration and Academic Performance

The third objective was to investigate how principals' supervision of ICT integration affects academic performance.

4.6.1 Supervision Strategies

The effective supervision of ICT (Information and Communication Technology) integration by school principals is critical for enhancement of academic performance not only in public secondary schools, but in all learning institutions. Results of the research indicate that a considerable portion of respondents (23.85%) *strongly agree* that the principal's use of ICT tools to call on teachers who are not integrating ICT effectively influences overall ICT integration and contributes to improved academic performance. Additionally, 37.61% *agree*, indicating that more than half of respondents see value in this supervisory approach. However, 13.76% *disagree* and another 13.76% *strongly disagree*, suggesting that some respondents might not perceive this strategy as effective or feel that it does not positively impact academic outcomes. The principals' establishment of an ICT integration vision is viewed positively, with 31.75% of participants *strongly agreeing* and 35.71%

agreeing that this initiative eases the supervision process and enhances academic performance. Emmanuel (2021) has highlighted the importance of supervision of ICT integration to improve academic performance. The lower percentage of respondents (11.90%) who *disagree* indicates that the majority find this strategy beneficial in providing clear direction for ICT integration within the school.

The use of ICT gadgets by principals to monitor ICT integration received a positive response from 27.45% of respondents who *strongly agree* and 32.35% who *agree* that this approach promotes ICT integration and ultimately improves academic performance as discovered by Julius (2018). However, a notable 19.61% *disagree*, which highlights that while many respondents recognize the benefits of this strategy, there is a significant portion who may not see its effectiveness in practice. Overall, the findings suggest that principals' supervisory strategies, including the application of technological tools for monitoring and creation of a clear vision for ICT integration, are generally viewed positively by respondents. However, the presence of disagreement among some respondents indicates room for improvement in how these strategies are implemented and perceived within the school environment. The table 11 below provides the principals' supervision strategies.

Table 11: Supervision Strategies

No.	Supervisory strategies	SA	A	U	D	SD
		5	4	3	2	1
1	In my institution, my school head's employment of ICT tools to summon teachers who do not integrate ICT in teaching influences ICT integration that result to academic performance	23.85%	37.61%	11.01%	13.76%	13.76%
2	In my secondary school, the principal's creation of a school ICT integration vision has eased his/her supervision work, thus enhancing academic performance	31.75%	35.71%	10.32%	11.90%	10.32%

3	My principal use of ICT gadgets to monitor ICT integration has promoted ICT integration, and eventually promoted academic performance	27.45%	32.35%	7.84%	19.61%	12.75%
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4.7 Principals' Support for Teacher ICT Capacity Building and Academic Performance

The fourth objective focused on how principals' support for teacher ICT capacity building influenced academic performance. The support of principals for teacher ICT capacity building is essential for enhancing academic performance in schools (Hermawan et al., 2018). By investing in the expert growth of teachers, principals can ensure that educators are furnished with the essential skills and information to efficiently integrate ICT into their instructional practices. The table 12 below provides the impact of instructors' ICT capacity building on academic performance.

Table 12: Impact of teachers' ICT capacity building on academic performance

No.	Test Items	SA	A	U	D	SD
		5	4	3	2	1
1	In my secondary school, my principal takes staff for ICT training, making them more competent to integrate ICT in teaching, and eventually improving academic performance outcomes	30.51%	29.66%	16.10%	16.10%	7.63%
2	In my secondary school, my principal provides the necessary ICT materials for training, motivating teachers to attend training, improving academic performance outcomes	25.71%	31.43%	15.24%	14.29%	13.33%
3	My principal facilitates ICT training by giving money for transport and accommodation, motivating teachers, and improving academic performance outcomes in my school	38.60%	33.33%	6.14%	17.54%	4.39%

A significant portion of respondents (30.51%) *robustly agree* that their principal's initiative to take staff for ICT training has made them more competent in integrating ICT into teaching, thereby

improving academic performance. Additionally, 29.66% *agree*, reflecting a general consensus on the importance of training for enhancing teachers' skills as Adamu and colleagues (2017) states. However, a significant 16.10% *disagree* and another 16.10% *neutral*, indicating some uncertainty or dissatisfaction regarding the effectiveness of this training.

In terms of providing necessary ICT materials for training, 25.71% of respondents *strongly agree*, and 31.43% *agree* that this practice motivates teachers to attend training and ultimately improves academic performance outcomes. However, the presence of 14.29% who *disagree* and 13.33% who *strongly disagree* suggests that not all respondents see this strategy as effective in motivating teachers or enhancing performance.

The principal's provision of financial support for transport and accommodation for ICT training received a positive response, with 38.60% *strongly agreeing* and 33.33% *agreeing* that this motivation leads to improved academic performance outcomes as supported by Dlamini and Mbatha (2018). Only 17.54% *disagree* and 4.39% *strongly disagree*, indicating that the majority of respondents believe that financial support significantly enhances teacher participation in training.

Overall, the findings suggest that principals' capacity-building efforts, including ICT training and provision of resources, are viewed positively by many respondents as beneficial for improving academic performance. However, the presence of disagreement among some respondents indicates potential areas for improvement in how these initiatives are implemented and perceived, particularly concerning the effectiveness of training and material provision.

4.8 Thematic Analysis of the Interview with the Sub-County Director on the Influence of Principals' ICT Integration Strategies on Academic Performance

We talked with the Education Leader for the Chiakariga area in Tharaka Nithi County. The chat gave us helpful info on how school bosses use tech in learning, and how this affects how well kids do in public high schools. Thematic analysis of the responses reveals four key themes aligned with

the study's objectives: provision of ICT materials, advocacy for ICT integration, supervisory roles of principals, and support for teachers' ICT capacity building.

1. Provision of ICT Materials

The Sub-County Director emphasized the importance of providing adequate ICT materials in schools as a foundational step toward enhancing academic performance. According to the director, *"Many schools in the sub-county are now connected to electricity, which has significantly boosted their ability to integrate ICT."* However, he noted that not all schools have the necessary resources to effectively teach computer subjects, which affects student performance in comparison to other subjects. The director mentioned, *"Budgetary allocations for ICT integration are crucial. Unfortunately, the funding is often insufficient to meet the needs of all schools."* He highlighted that partnerships with various organizations play a pivotal role in bridging these gaps, stating, *"We collaborate with NGOs and other stakeholders to provide necessary ICT tools, ensuring that recognized ICT centers experience better academic outcomes."*

2. Advocacy for ICT Integration

As the chief executive of the Sub-County, the director expressed a strong commitment to advocating for ICT integration across schools. He explained, *"My role involves pushing for policies that promote ICT integration, ensuring that all educational stakeholders understand its importance for improving academic performance."* The director mentioned the existence of a structured ICT policy designed to facilitate this integration. He elaborated, *"This policy not only guides schools in implementing ICT but also mandates regular reviews to assess its effectiveness."* Furthermore, he noted his personal use of ICT in administration, indicating, *"I utilize tools such as email, educational management software, and virtual meetings to streamline operations and enhance communication regarding academic performance."*

3. Supervisory Role of Principals

The director's insights into the supervisory role of principals in ICT integration revealed the complexity of this responsibility. He indicated, "Principals must actively supervise the use of ICT tools among teachers to ensure they are being used effectively for academic improvement." The director pointed out that while some teachers appreciate these tools, others may feel intimidated by their implementation. *"It's essential for principals to foster an environment where teachers feel supported rather than pressured,"* he advised. He noted that the use of ICT for communication, such as emails and WhatsApp, has improved responsiveness among school administrators and teachers, facilitating timely discussions on academic performance. *"Regular meetings conducted through ICT tools have become more efficient, allowing us to address performance issues promptly,"* he added.

4. Support for Teachers' ICT Capacity Building

The Sub-County Director highlighted the necessity of supporting teachers' capacity building in ICT integration. He shared, *"We conduct ICT training for teachers quite often, recognizing that their proficiency directly impacts student performance."* To encourage attendance, he mentioned several motivational strategies, such as providing incentives, recognition for participation, and incorporating ICT training into professional development plans. He remarked, *"Allocating funds specifically for ICT tools and training is essential. Our budget reflects a commitment to enhancing the ICT capabilities of our educators."* The director articulated the defined roles of principals in this process, stating, *"Principals are tasked with not only overseeing ICT integration but also actively participating in training sessions, fostering a culture of continuous learning and improvement."*

In conclusion, the thematic analysis of the interview with the Sub-County Director reveals a multifaceted approach to ICT integration in Chiakariga Sub-County's public secondary schools. The findings underscore the critical role of principals in providing ICT materials, advocating for

integration, supervising their effective use, and supporting teachers' capacity building. These strategies are essential for enhancing academic performance, and the commitment of educational leaders is paramount in driving this change. The director's insights reflect a growing recognition of ICT's potential to transform education, aligning with the broader goals of improving academic outcomes in the region.



CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides the summary of findings, conclusion, and recommendations of the study.

5.2 Summary of Findings

The study gave us some important information. It showed us how headteachers, in public high schools in Chiakariga, used technology in their schools. This use of technology affected how the students did academically. This part of the article explains these results. It ties these results back to the goals of the study.

Objective 1: Influence of Principals' Provision of ICT Materials on Academic Performance

The investigator found that access to technology materials significantly influences academic performance. With 30.65% of respondents indicating that electricity is a major ICT resource, and 23.23% confirming the availability of computers and laptops, it is evident that adequate ICT resources are vital for instructional process. However, the limited availability of key resources, such as projectors (5.48%) and storage devices (9.35%), poses a challenge to full ICT integration in classrooms. These devices enable the integration of digital learning tools and application of educational software. Also, dependable internet connectivity is crucial for accessing online resources, carrying out research, and engaging in interactive learning. The availability of high-speed internet varies, with urban schools generally having better access than rural schools. Additionally, interactive whiteboards and projectors allow teachers to present digital content, enhancing the interactivity and visual appeal of lessons.

The positive impact of digital resources on educational outcomes was highlighted, with 30.65% of respondents stating that engaging learning environments promote better student outcomes. ICT tools, such as the internet and digital libraries, provide learners with access to an immense array of

resources, research materials, and learning content, improving their knowledge and understanding of subjects. For instance, the use of interactive learning software, multimedia presentations, and educational games makes lessons more engaging, helping students to better retain information and concepts. ICT enables personalized learning experiences through adaptive learning platforms, where students can progress at their own pace, addressing individual strengths and weaknesses. This tailored approach often leads to better academic outcomes.

Students can work together on projects more effectively, improving their collaborative skills. Exposure to ICT resources helps students acquire crucial digital literacy skills, which are becoming essential in modern education and the workforce. Being able to navigate digital platforms and use tools for assignments can improve overall academic achievement. ICT tools make it easier for teachers to assess student performance, provide instant feedback, and offer resources for improvement. This instant response loop helps learners discover areas for improvement, leading to better outcomes. ICT tools such as text-to-speech software, screen readers, and adaptive devices are central in helping students who are abled differently to access learning materials more easily, improving their educational performance.

This aligns with existing literature that underscores the importance of technology in enhancing educational experiences. Teachers who are trained in ICT-based teaching methods tend to achieve better outcomes. The degree to which technology is embedded in the core curriculum also plays a crucial role. ICT should complement rather than replace traditional teaching methods, aligning with learning objectives to have the most positive impact on performance. Students who are more engaged with ICT are likely to outperform others academically. Therefore, the design of digital learning environments should focus on fostering student motivation and engagement. The socioeconomic background of students influences how they can use ICT resources. Thus, the provision of adequate ICT resources is essential for fostering an environment conducive to

academic achievement.

Objective 2: Effect of Principals' Advocacy for ICT Integration on Academic Performance

The results indicated that principals' advocacy for ICT incorporation plays a vital function in promoting academic performance. A significant number of respondents (43.78%) acknowledged that their principals' employment of technology in instructional process influences the overall incorporation of technology in the school. Moreover, the creation of an ICT integration vision was supported by 31.75% of respondents, emphasizing its role in guiding teachers and improving performance. This means that principals must clearly define the role of ICT in supporting school's educational goals. This vision should align with school's overall mission and emphasize the importance of digital literacy and technology-enhanced learning. ICT integration requires careful planning. Principals should develop a long-term strategy that outlines specific goals for technology use, including infrastructure development, software acquisition, and professional development for staff.

Also, principals need to lead by example. Principals can serve as role models by using ICT in their daily tasks, such as managing school data, communicating with staff, and facilitating virtual meetings. Demonstrating a personal commitment to technology encourages others to follow suit. Encouraging innovation in teaching through technology by adopting new tools and pedagogical approaches that integrate ICT shows the entire school community that digital transformation is a priority.

The results of the study indicate that principals should give due attention to professional development and training for ICT to improve academic performance. One of the principal's key responsibilities is to ensure that teachers receive adequate ICT training. Offering ongoing professional development workshops helps teachers gain confidence in utilizing technology in the instructional process. Encouraging teachers to work together and share stupendous practices in

technology use fosters a supportive environment for learning. Principals can organize peer-learning sessions where tech-savvy teachers share their knowledge with others. Principals can establish mentorship programs where experienced ICT users steer other tutors in incorporating ICT into their teaching methods.

The results suggest that there is need for principals to make sure ICT materials are accessible to in schools. This means that they need to advocate for adequate funding to provide the necessary ICT infrastructure, such as computers, tablets, interactive whiteboards, reliable internet, and educational software. This ensures equal access to ICT for both students and teachers. Principals should work to minimize the digital divide by making sure that learners, including those from low-income families as well as areas, have access to the necessary technology, such as through school-provided devices or community initiatives.

Principals play a huge role in collaborating with stakeholders. The findings indicated that principals engage with students, teachers, parents, and local communities in discussions about the huge positive results correlated with the utilization of ICT in education. Hosting workshops or seminars to demonstrate the benefits of technology in learning can build broader support for ICT initiatives. Partnering with technology companies, government agencies, or non-profits can help provide funding, resources, or training that the school might not otherwise have. Principals can also work with local businesses or universities to bring in expertise and resources.

Principals should develop clear policies concerning the use of technology in schools, including guidelines on digital citizenship, appropriate use of technology, internet safety, and data privacy. These policies ensure that technology is used responsibly and ethically. Establishing clear benchmarks for ICT use in education ensures that progress is measurable. Principals can set performance indicators to establish whether ICT utilization is effective improving academic performance and teaching efficiency or not.

These findings suggest that principals who actively advocate for ICT and demonstrate positive attitudes towards its integration can significantly impact teachers' perceptions and practices. This corroborates previous studies that highlight the importance of leadership in educational technology adoption. However, the mixed responses regarding the mobilization of parents for funding indicate that while advocacy is essential, it must be accompanied by effective community engagement strategies to ensure comprehensive support for ICT initiatives.

Objective 3: Influence of Principals' Supervision of ICT Integration on Academic

Performance

The findings demonstrate that principals' supervision strategies, such as employing ICT tools for monitoring and summoning teachers, are perceived as influential in enhancing ICT integration. With 23.85% of respondents strongly agreeing that these strategies affect academic performance, it is clear that supervision is a key component of effective ICT integration, and eventually, this leads to excellent academic performance. As a result, enhanced access contributes to a more conducive learning atmosphere, which directly impacts students' academic success. For instance, principals can articulate a clear vision and set specific goals for ICT integration in the curriculum. By outlining expected outcomes and aligning technology use with academic objectives, they help ensure that all stakeholders understand the importance of technology in enhancing learning outcomes. Additionally, principals can organize ongoing professional development sessions focused on ICT tools and pedagogical strategies. Training equips instructors with the needed expertise that they require to integrate technology effectively into their instructional practices, leading to improved quality and student outcomes.

The positive perceptions surrounding the creation of an ICT vision further support the notion that strategic leadership in supervision can lead to better academic outcomes. However, the presence of disagreement among some respondents highlights the need for continuous improvement and

adaptability in supervision practices, ensuring they are effective and perceived positively by all stakeholders.

Objective 4: Impact of Principals' Support on Teachers' ICT Capacity Building on Academic Performance

The study revealed that principals' support for teachers' ICT capacity building significantly influences academic performance. A majority of respondents acknowledged that taking staff for ICT training (30.51%) and providing necessary materials (25.71%) were effective strategies in enhancing teachers' competence. Furthermore, financial support for training was particularly noted, with 38.60% of respondents believing it positively impacts academic performance. Principals' support for teacher ICT capacity building is vital for improving academic performance. By offering professional development openings, allocating resources, promoting a collaborative culture, and fostering innovative practices, principals empower tutors to effectively incorporate ICT into their teaching. The resulting enhancement in instructional quality leads to increased learner engagement, individualized learning experiences, and improved academic outcomes. As educational technology continues to evolve, the role of principals in supporting ICT capacity building will be essential for ensuring that learners are prepared for success in an increasingly digital world.

These findings align with the understanding that continuous professional development is critical in furnishing tutors with the needed knowledge and skills to successfully incorporate ICT into their instructional practices. The recognition of training and resources as vital components of capacity building suggests that principals must prioritize these initiatives to foster an environment of growth and improvement.

5.3 Conclusion

Overall, the findings indicate that principals' ICT integration strategies significantly influence academic performance in public secondary schools.

Objective 1: Influence of Principals' Provision of ICT Materials on Academic Performance

The provision of digital materials is critical to improved academic performance. As revealed by the study, the positive impact of ICT resources on academic performance was highlighted, with 30.65% of respondents stating that engaging learning environments promote better student outcomes. ICT tools, such as the internet and digital libraries, provide learners with access to an immense array of resources, research materials, and learning content, improving their knowledge and understanding of subjects. In this view, the provision of adequate ICT resources is essential for fostering an environment conducive to academic achievement.

Objective 2: Effect of Principals' Advocacy for ICT Integration on Academic Performance

It is evident that principals' advocacy for ICT incorporation plays a vital function in promoting academic performance. Developing ICT policy that aligns with educational goals as well as leading by example by principals in integrating technology can go a long way in improving educational outcomes. This is in addition to motivating instructors and learners to incorporate ICT in instructional processes. However, the mixed responses regarding the mobilization of parents for funding indicate that while advocacy is essential, it must be accompanied by effective community engagement strategies to ensure comprehensive support for ICT initiatives.

Objective 3: Influence of Principals' Supervision of ICT Integration on Academic Performance

The findings from the study demonstrate that there is a positive relationship between supervision of digital incorporation and academic performance. Notably, supervision is a key component of effective ICT integration, and eventually, this leads to excellent academic performance. Therefore, principals should embrace it to monitor teaching and learning process and eventually improve academic performance.

Objective 4: Impact of Principals' Support on Teachers' ICT Capacity Building on Academic

Performance

There is adequate support that principals' support on teachers' ICT capacity building positively and significantly impacts academic performance. This is explicit from the results of the investigation. These findings align with the understanding that continuous professional development is critical in equipping teachers with the needed skills to successfully integrate technology into their instructional practices. As educational technology continues to evolve, the role of principals in supporting ICT capacity building will be essential for ensuring that learners are prepared for accomplishment in a progressively digital globe.

5.4 Recommendations

The current research suggests some ways to better use technology, like computers and the internet, to advance students' learning results in public high schools in Chiakariga Sub-County, Tharaka Nithi County, Kenya.

Objective 1: Increase Availability of ICT Resources

The study revealed that limited access to ICT tools, such as projectors and internet connectivity, hinders effective ICT integration. It is recommended that:

- **School administrations** partner with government agencies, non-governmental organizations (NGOs), and local communities to increase funding for ICT infrastructure, including computers, projectors, and reliable internet.
- **Government bodies** should prioritize budgetary allocations for ICT infrastructure in schools to bridge the existing gaps and promote equitable access to technology.
- **Private sector partnerships** should be encouraged to provide affordable or subsidized ICT equipment to schools.

Objective 2: Strengthen Principals' Advocacy for ICT Integration

While principals' advocacy has been positively received, there is room for improvement in

engaging parents and the wider community. Recommendations include:

- **Principals** should develop comprehensive ICT advocacy strategies that include parents, teachers, and the community to promote a shared vision for ICT integration.
- **Workshops and seminars** should be organized for parents to highlight the importance of ICT in education and encourage their involvement in fundraising or resource provision for schools.
- **Policy development:** Principals should be supported to create and implement school-wide ICT policies that provide clear guidelines on ICT usage in teaching and learning.

Objective 3: Enhance Supervisory Practices in ICT Integration

Effective supervision of ICT integration was linked to improved academic performance. To further strengthen this, it is recommended that:

- **Principals** adopt regular and structured supervision practices that monitor ICT use by teachers, ensuring that it aligns with the school's educational goals.
- **Use of digital tools** for supervision should be expanded, with principals employing online platforms and software to streamline supervision and provide constructive feedback to teachers.
- **Training on supervision techniques** should be provided to principals, focusing on how to encourage effective ICT use without being overly punitive, thereby fostering a supportive environment for teachers.

Objective 4: Support Continuous Professional Development for Teachers

The study emphasizes the significant role of training teachers in technology. To improve this, the following are recommended:

- **Principals and school administrators** should prioritize ongoing ICT training for teachers, making sure that they are furnished with the necessary skills to incorporate technology

effectively into their instructional practices.

- **Financial support:** Schools should explore more sustainable ways to finance teachers' training, including securing grants from educational bodies and NGOs.
- **Peer learning opportunities:** Teachers who have successfully integrated ICT should be encouraged to mentor others through peer learning programs or collaborative projects.

5.5 Recommendations for Future Research

While this study has given valuable insights into the role of principals in ICT integration and academic performance, several areas warrant further investigation:

1. Longitudinal Studies on ICT Integration and Performance

Future research should explore the long-term effects of digital learning on academic performance. A longitudinal investigation would help to determine whether the positive impacts of ICT, such as improved student engagement and personalized learning, are sustained over time.

2. Impact of ICT Integration in Specific Subject Areas

Further research could focus on how ICT impacts performance in specific subject areas, such as STEM (Science, Technology, Engineering, and Mathematics) versus non-STEM subjects.

Understanding the differential impacts could help tailor ICT integration strategies to the unique needs of various academic disciplines.

3. Gender Differences in ICT Use and Academic Performance

Given the gender disparities observed in the leadership roles of principals and the slight imbalance in student representation, future studies could examine how gender influences ICT adoption, usage patterns, and its subsequent impact on academic performance.

4. Exploring the Role of Non-Academic ICT Usage

This study identified ICT misuse as a challenge. Future research could investigate the nature of non-academic ICT usage (such as social media and gaming) and its impact on both student focus

and academic outcomes, to develop strategies for minimizing distractions.

5. Comparative Studies across Different Counties or Regions

A comparative study between counties or regions would offer a broader comprehension of how regional factors, such as infrastructure and socio-economic conditions, influence the efficiency of digital learning in schools. This would help in identifying context-specific solutions.

6. Effectiveness of Teacher-Principal Collaboration in ICT Integration

Further research could explore how collaborative efforts between teachers and principals influence the success of ICT integration. Such studies would examine the dynamics of leadership and teamwork in promoting technology-enhanced learning environments.



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APPENDICES

APPENDIX I: Letter of Introduction

March 2024

Dear Sir/Madam,

RE: PERMISSION TO CARRY OUT RESEARCH

I am a student studying a course in Master of Education in Education, Administration, Leadership, and Management in Mount Kenya University. I am researching on **The influence of Principals' ICT Integration Strategies on Academic Performance in Public Secondary Schools in Chiakariga Sub-County, Tharaka Nithi County, Kenya**. In this view, I hereby ask your office to allow me carry out the research in your county.

I will be glad if you assistance me.

Kind Regards.

Yours faithfully,



Joyce Karauki Murithi

APPENDEX III: Students' Assent to be in a Research Project

Dear Respondent,

Research Title: The Influence of Principals' ICT Integration Strategies on Academic Secondary Schools' Performance in Chiakariga Sub-county, Tharaka Nithi County, Kenya.

Researcher: Joyce Karauki Murithi

Date: 07/06/2024

Invitation to be in a Research Study

You are invited to participate voluntarily in the research study. Your invitation is based on the fact that you are the consumer of digitalization of learning, thus, you will provide critical insights into school heads' technology integration strategies in your school.

Purpose of the Study: The study will concentrate on assessing the influence of principals' ICT integration strategies on academic performance in Chiakariga sub-county, Tharaka Nithi County, Kenya

Your Rights: It is vital for you to note that participating in this investigation is upto you and you may choose to opt out any time without getting worried that anybody will be offended when you quit. In case of any changes in the study that may affect you, you will be informed about them.

Procedures: It is anticipated that you will not spend more than 30 minutes to fill in the questionnaires. You will provide your responses in the questionnaires, which will be analyzed later.

Alternatives: You are free to decide that you do not want to continue to be in the study

Risks: It is likely that some questions may require crucial information about your principal and teachers. You are free to refuse to answer any question you are uncomfortable with in the questionnaire.

Benefits: Findings will help to improve instructional processes and consequently your academic performance.

Costs: Participating in the study will only cost you the time that you will use to fill the questionnaire.

Confidentiality: The information you will provide will be confidential and in accordance with the law. You will not be required to include your personal details in the questionnaire. The researcher will not share your information with anyone.

Questions: Please feel free to make any inquiries you may have about the study or your rights in this research project. If you think of other questions later, you may contact me through 0713759876 anytime

This research study and my rights as a study volunteer have been explained to me. I had an opportunity to discuss it with the investigator and all my questions have been accurately responded to.

- I accept to participate in this study as a volunteer
- I understand that I may opt out of this project any time.
- I have been provided with a copy this form

Signature.....**Date**.....

APPENDIX IV: Questionnaire for students

Dear Respondent,

The researcher is a student studying a degree course in Master of Education in Administration, Leadership and Management in Mount Kenya University. The researcher is assessing: **The Influence of Principals’ ICT Integration Strategies on Academic Secondary Schools’ Performance in Chiakariga Sub-county, Tharaka Nithi County, Kenya.** The information obtained from you will be confidential and utilized for this research only.

Section A: General Guidelines

Instruction: Please tick appropriately in the space provided.

Gender: Male [] Female []

Do you enjoy using learning using computers?

Yes

No

No



If yes, give reasons for your answer

.....
.....

Can you use ICT gadgets, such as laptops, phones and do assignment?

Yes

No

If no, give reasons for your

answer.....

.....
.....

If yes, give areas you use it in

learning.....

.....
.....

Give ways in which the use of ICT has helped to advance your academic

performance.....

.....
.....

How often per week do teachers teach using ICT to improve academic performance?

Does your principal teach using ICT tools, such as laptops projectors to enhance retention of

knowledge?

Yes

No

Indicate in the table below whether the following items are available in the school

Item/Equipment	Yes	No
Computer Lab		
Electricity		
Computer/Laptops		
Projectors		
Internet/wifi		

Storage devices		
-----------------	--	--

How does the utilization of technological tools in instructional process by your teachers improve your comprehension, and eventually improve your academic performance?

[Yes]

[No]



Mount Kenya University

Secondary Schools

Please, in a scale of 1-3, rate how often your principal undertakes the following tasks at school

Activities where Stakeholders are Involved	Very Often (3)	Rarely (2)	Never (1)
Ensuring unlimited ICT resources are available and functioning to promote academic performance			
Mobilizes parents to contribute funds to purchase ICT resources to promote academic performance			
Purchases multimedia products to promote academic performance.			
Partners with NGOs to promote ICT integration in school to promote academic performance			

1. Rate the degree to which you are in agreement with the following propositions on how undertaking the above activities influences school performance

Key: **SA**-Strongly Agree **A**-Agree **U**-Undecided **D**-Disagree **SD**-Strongly Disagree

No.	Test Items	SA	A	U	D	SD
		5	4	3	2	1
1	Ensuring unlimited ICT resources are available and functioning has improved academic performance					
2	Mobilizing parents contribute funds to purchase ICT resources avails more ICT resources, promoting its integration, and eventually promoting academic performance in school					
3	Purchasing multimedia products, promotes the security of school data, and promotes instructional process in the learning institution, and consequently improves academic performance					
4	Partnering with NGOs to enhance ICT integration has promoted ICT integration in the school, and eventually improved academic performance					

Section D: Principals' Advocacy Strategies and Academic Performance in Public Secondary Schools

1. Please, on a scale of 1-3, rate how often your principal advocates ICT integration in your secondary school

Advocacy strategies	Very Often (3)	Rarely (2)	Never (1)
Teaching using ICT to improve academic performance			
Using ICT in the management of the school to improve academic performance			
Having a positive attitude toward ICT integration to improve academic performance			
Developing the school's ICT policy to improve academic performance			
Developing the School's ICT vision to foster ICT integration, and eventually promote academic performance			

2. Rate the degree to which you are in agreement with the following propositions on how advocacy strategies which your principal adopts influence institutional performance

Key: **SA**-Strongly Agree **A**-Agree **U**-Undecided **D**-Disagree **SD**-Strongly Disagree

No.	Test Items	SA	A	U	D	SD
		5	4	3	2	1
1	In my secondary school, the school head's use of ICT to teach influences ICT integration in school, promoting improved academic performance					
2	In my secondary school, the principal's positive attitude towards ICT integration influences teachers' perception					

	towards the same and eventually academic performance outcomes					
3	My principal has developed the school's ICT policy, which has helped to improve academic performance					
4	My principal has created the school's ICT vision, which guides teachers in teaching to improve academic performance.					

Section E: Principals' Supervisory Strategies and Academic Performance in Public Secondary Schools

1. Please, on a scale of 1-3, rate how often your principal advocates ICT integration in your secondary school

Advocacy Activities	Very Often (3)	Rarely (2)	Never (1)
My principal uses ICT tools to summon teachers who do not integrate ICT into teaching to improve academic performance			
My principal has created a school vision for technology integration in instructional process to promote academic success			
Principal monitors teachers' ICT integration using ICT gadgets to promote academic performance			

2. Rate the degree to which you are in agreement with the following propositions on how supervisory strategies adopted by your principal influence academic performance

Key: **SA**-Strongly Agree **A**-Agree **U**-Undecided **D**-Disagree **SD**-Strongly Disagree

No.	Supervisory strategies	SA	A	U	D	SD
		5	4	3	2	1
1	In my learning institution, my school head's employment of ICT tools to summon teachers who do not integrate ICT in teaching influences ICT integration that result to academic performance					
2	In my secondary school, the principal's creation of a school ICT integration vision has eased his/her supervision work, thus enhancing academic performance					
3	My principal use of ICT gadgets to monitor ICT integration has promoted ICT integration, and eventually promoted academic performance					

Section F: Principals' Support on teacher Capacity Building and Academic Performance in Public Secondary Schools

1. Please, in a scale of 1-3, rate how often your principal advocates ICT integration in your secondary school

Teacher ICT Capacity Building Strategy	Very Often (3)	Rarely (2)	Never (1)

My principal takes staff to ICT training to improve academic success			
My principal avails the necessary ICT materials for training to inspire teachers to integrate ICT in instructional process to promote academic performance			
My Principal facilitates ICT training to improve academic performance in my school			

2. Rate the degree to which you are in agreement with the following propositions on how support on teacher in capacity building that is promoted by your principal influences academic performance

Key: **SA**-Strongly Agree **A**-Agree **U**-Undecided **D**-Disagree **SD**-Strongly Disagree

No.	Test Items	SA	A	U	D	SD
		5	4	3	2	1
1	In my learning institution, my school head takes staff for ICT training, making them more competent to integrate ICT in instructional process, and consequently improving academic performance outcomes					
2	In my secondary school, my principal provides the necessary ICT materials for training, motivating teachers to attend training, improving academic performance outcomes					
3	My principal facilitates ICT training by giving money					

	for transport and accommodation, motivating teachers, and improving academic performance outcomes in my learning institution.					
--	---	--	--	--	--	--



APPENDIX VI: Interview Guide for Principals

Dear Respondent,

The researcher is undertaking a degree course in Master in Education in Administration, leadership, and Management at Mount Kenya University and is researching **The Influence of Principals' ICT integration Strategies on Academic Performance in Public Secondary Schools in Chiakariga Sub-County, Tharaka Nithi County, Kenya.**

Section A: General Information

Instruction: Please tick as appropriate in the space provided.

1. Gender: Male [] Female []
2. Highest Level of Educational Attainment
Certificate [] Diploma [] Degree [] Post-graduate []
3. State the period you have been in the profession.....

Section B: Provision of ICT materials in Public Secondary School?

1. How many **(i)** computers { } **(ii)** Laptops { } **(iii)** Projectors { } **(iv)** Multimedia Sources { } does your school has?
2. How many **(i)** Computers { } **(ii)** Laptops { } **(iii)** Projectors { } **(iv)** Multimedia Sources { } are functional?
3. What is the source of funds for purchasing ICT materials that help to improve academic performance?
4. Who do you partner with to buy ICT integration in your institution to improve academic performance?

Section C: Principals' Advocacy of ICT Integration on Academic Performance in Public Secondary Schools in Chiakariga Sub-County, Tharaka Nithi County, Kenya.

1. How do you advocate for ICT integration in your school to promote academic performance?

2. Do teachers emulate you and integrate ICT in teaching and improve performance outcome?

3. Have you realized any improvement in academic performance when you use ICT in teaching?

4. Do you have an ICT vision for the school that drives the school towards excellence academic performance?

Section D: Principals' Supervisory role in ICT integration on Academic Performance in Public Secondary Schools in Chiakariga Sub-County, Tharaka Nithi County, Kenya.

1. Explain how you use ICT gadgets to monitor ICT integration in your institutions to improve academic performance in school?
2. How has this kind of monitoring helped to improve academic performance in your school?
3. How do teachers take this kind of monitoring to improve academic performance?
4. To what extent have the schools in your sub-county realized any academic improvement after the TSC introduced the TPAD?

Section F: Principals Support on Human Resource Capacity Building in ICT Integration on Academic Performance in Public Secondary Schools in Chiakariga Sub-County, Tharaka Nithi County, Kenya.

1. How often do you take your staff for training?

[Quite Often] [Often] (Rarely]

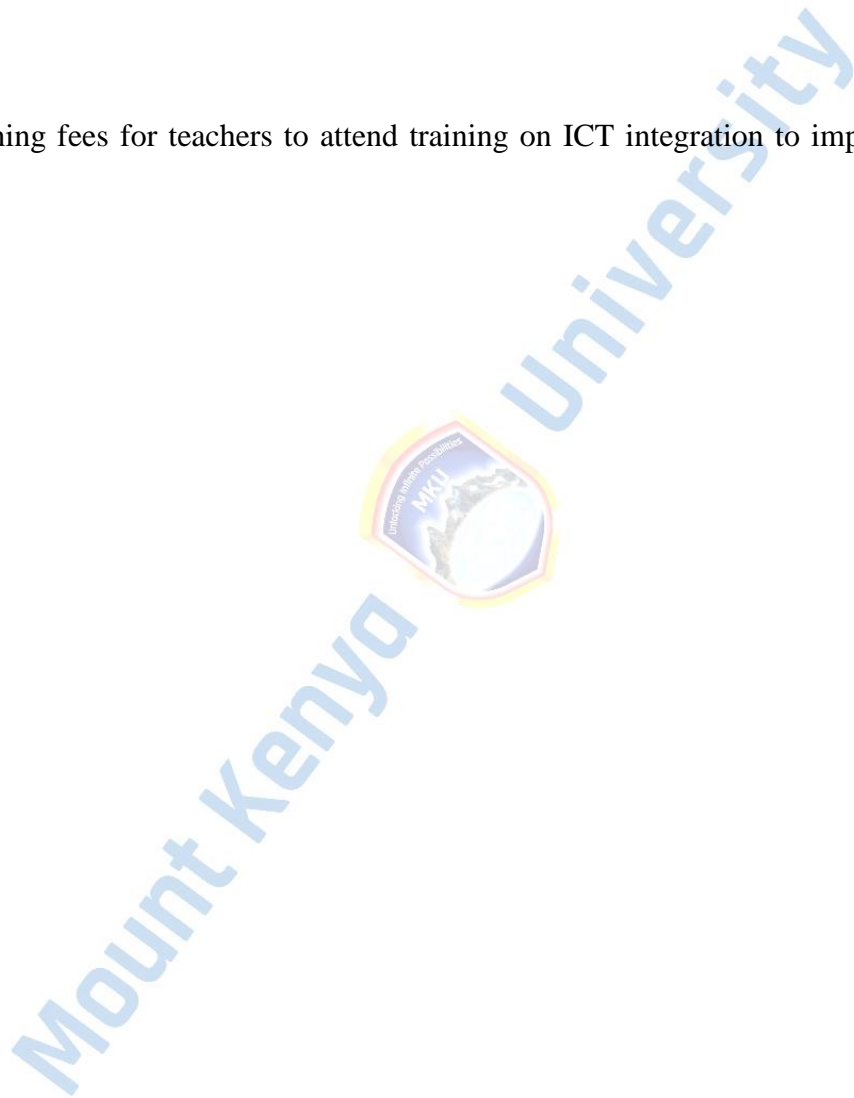
2. Do the trained teachers apply the ICT skills in classroom teaching?

[Yes] [No]

3. Have you realized any academic improvement after teachers are trained on integrating ICT in teaching?

[Yes] [No]

4. Do you give training fees for teachers to attend training on ICT integration to improve academic performance?



APPENDIX VII: Interview Guide for Sub-County Director of Education

Dear Respondent,

The researcher is undertaking a degree course in Master in Education in Administration, leadership, and Management at Mount Kenya University and is researching **The Influence of Principals' ICT integration Strategies on Academic Performance in Public Secondary Schools in Chiakariga Sub-County, Tharaka Nithi County, Kenya.**

Section A: Provision of ICT materials in Public Secondary Schools.

Section A: General Information

Instruction: Please tick appropriately in the provided space.

1. Gender: Male [] Female []
2. Highest Level of Educational Attainment
Certificate [] Diploma [] Degree [] Post-graduate []
3. State the period you have been in the profession.....

Section B: Provision of ICT materials in Public Secondary Schools

1. How many schools in this sub-county are connected with electricity to promote ICT integration and improve academic performance?
2. How many schools in this sub-county teach computer as a subject and how is it performed in relation to other subjects?

3. Is there budgetary allocation for ICT integration in schools in schools in your Sub-county to improve academic performance? If yes, how much?

4. Is there any organization that you partner with to promote ICT integration and improve academic performance in your sub-county?

5. From the schools recognized as ICT centres, is there any difference in terms of academic performance?

Section C: Principals' Advocacy of ICT Integration on Academic Performance in Public Secondary Schools in Chiakariga Sub-County, Tharaka Nithi County, Kenya.

1. As the CEO of the Sub-county, how do you advocate for ICT integration to improve academic performance?

2. What is the sub-county's ICT Policy that is developed to ensure schools integrate ICT and improve academic performance?

3. Do you use ICT in the administration of education in your Sub-County?

4. If yes, give five ways and areas where you utilize ICT in your Sub-County to improve academic performance.
 - i)
 - ii)
 - iii)
 - iv)
 - v)

Section D: Principals' Supervisory role in ICT integration on Academic Performance in Public Secondary Schools in Chiakariga Sub-County, Tharaka Nithi County, Kenya.

1. What ICT tools do you use to supervise teachers in your sub-county to improve academic performance?

2. Do teachers appreciate the use of such tools and focus on improving academic performance or they feel intimidated?

3. Are school administrators and teachers able to respond to summons using ICT tools, such as emails and whatsApp?

4. What ICT tools do you use to hold meetings about academic performance in your Sub-County?



Section E: Principals Support on teachers' Capacity Building in ICT Integration and Academic Performance in Public Secondary Schools in Chiakariga Sub-County, Tharaka Nithi County, Kenya.

1. How often does your sub-county hold ICT training for teachers in your sub-county?

2. What ways does your sub-county use to motivate principals and teachers to attend ICT training?

i)

ii)

iii)

iv)

v)

3. How much money do you allocate in a budget to avail the necessary ICT tools in schools to improve academic performance?

4. What are the defined and roles that principals about ICT integration and academic improvement?

i)

ii)

iii)

iv)

v)




Mount Kenya University

APPENDIX VIII: Observation Check List

Equipments/facilities	Available	Not available	Remarks
Internet			
Printers			
Laptops			
Simulation Software			
Storage Devices			
Scanner			
Photographs/ slides			
Videos			
Journals/Newspaper			
Books			
Realia			
Desktop computers			
Fans			
White boards			
Hub			
Furniture			
Electrical fuse			
Anti-Virus Software			
Connection cables			
Technician			
First Aid Kit			
Computer Laboratory			

APPENDIX IX: Introduction Letter from MKU


Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MED/2023/48188

12th September, 2024

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

Dear Sir/Madam,


RE: JOYCE KARAUKI MURITHI- REGISTRATION NO. MED/2023/48188

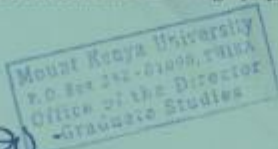
The purpose of this letter is to introduce the above named student who is pursuing Master of Education in the Department of Educational Management and Curriculum Studies in the School of Education.

The title of the research is "The Influence of Principals' ICT Integration Strategies on Academic Performance in Public Secondary Schools in Chiakariga Sub -County, Tharaka Nithi 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 September, 2024 and November, 2024.

Any assistance accorded to the student will be highly appreciated.

Thank you.

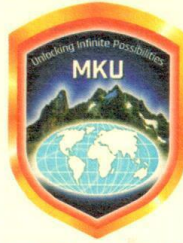

Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.


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

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Tel: +254 779 153 000 / +254 779 153 200

APPENDIX X: ERC Certificate

Mount Kenya University



REF: MKU/ISERC/4359

TO: JOYCE KARAUKI MURITHI

Date: 11 September 2024

REG: MED/2023/48188

Dear Sir/Madam,

RE: THE INFLUENCE OF PRINCIPALS' ICT INTEGRATION STRATEGIES ON ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN CHIAKARIGA SUB-COUNTY, THARAKA NITHI COUNTY, KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **3079**. The approval period is **11/09/2024 - 10/09/2025**.

This approval is subject to compliance with the following requirements;

- i. Only approved documents including informed consents, study instruments, MTA will be used
- ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
- vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely,



Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

APPENDIX XI: NACOSTI License

 **REPUBLIC OF KENYA**

 **NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION**

Ref No: **401629** Date of Issue: **28/September/2024**

RESEARCH LICENSE



This is to Certify that Ms. **JOYCE KARAUKI MURITHI** 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 **Tharaka-Nithi** on the topic: **THE INFLUENCE OF PRINCIPALS' ICT INTEGRATION STRATEGIES ON ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN CHIAKARIGA SUB-COUNTY, THARAKA NITHI COUNTY, KENYA** for the period ending : **28/September/2025**.

License No: **NACOSTI/P/24/40291**

401629
Applicant Identification Number


Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

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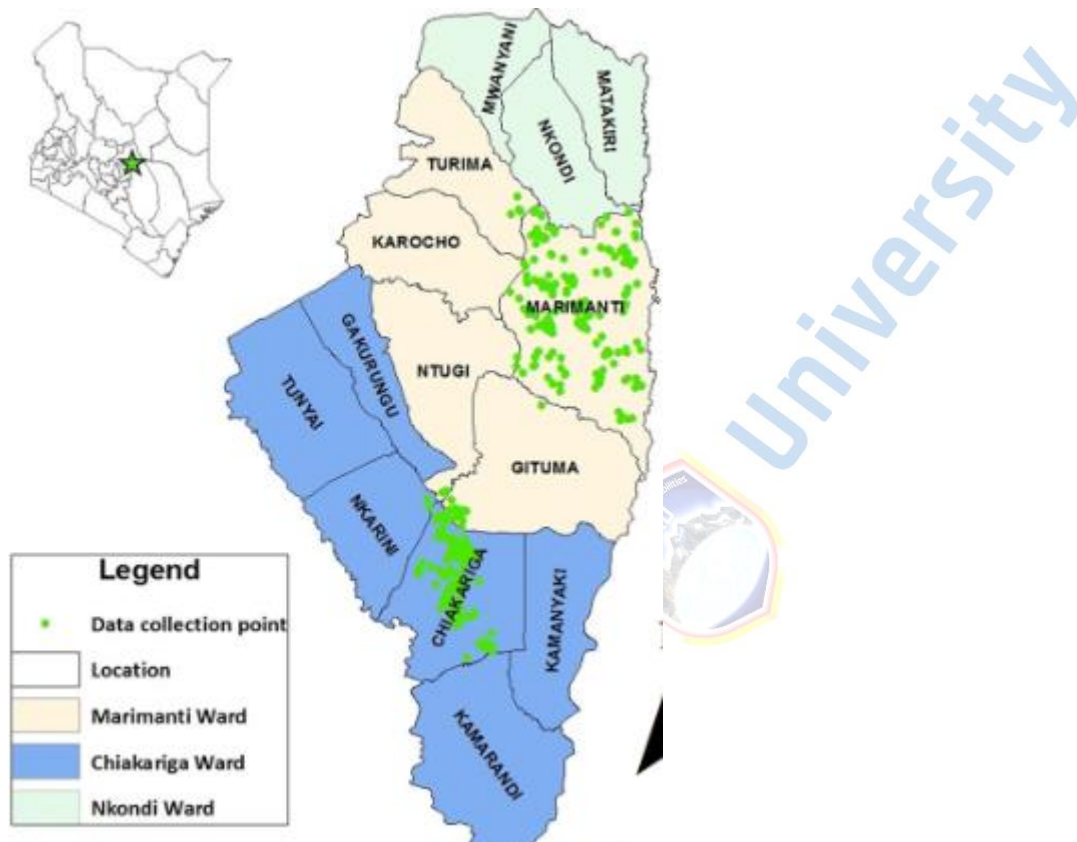


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See overleaf for conditions

APPENDIX XII: Map of Tharaka South Sub-County

MAP OF THARAKA SOUTH SUB-COUNTY WHERE CHIAKARIGA SUB-COUNTY WAS
COINED



NB: The blue-shaded area represents Chiakariga Ward, which is the current Chiakariga Sub-County

Source: Kua and Colleagues (2021)

APPENDIX XIII: Turnitin Report

Assignment

by User user

Submission date: 03-Nov-2024 02:32PM (UTC-0700)

Submission ID: 2506843738

File name: userfile (416.8K)

Word count: 22955

Character count: 138200

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**THE INFLUENCE OF PRINCIPALS' ICT INTEGRATION STRATEGIES ON
ACADEMIC PERFORMANCE IN PUBLIC SECONDARY SCHOOLS IN CHIAKARIGA
SUB-COUNTY, THARAKA NITHI COUNTY, KENYA**

JOYCE KARAUKI MURITHI

MED/2023/48188

**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF MASTER OF EDUCATION DEGREE IN
ADMINISTRATION, LEADERSHIP, AND MANAGEMENT OF
MOUNT KENYA UNIVERSITY**

OCTOBER, 2024

Assignment

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