HEADTEACHERS' TRANSFORMATIVE LEADERSHIP STRATEGIES ON TEACHERS' IMPLEMENTATION OF DIGITAL LITERACY TOOLS FOR LEARNING IN PUBLIC PRIMARY SCHOOLS IN NAKURU NORTH SUB-COUNTY, KENYA

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DECLARATION

I declare that this thesis is my original work, which I achieved as a result of my reading, reflection and personal research, and it has not been submitted to any other university for a degree. All information cited from different sources has been duly acknowledged.

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DEDICATION

I dedicate my work to my mother, Maria Maina and in loving memory of my father, Charles Maina, who laid a firm foundation for my education.

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I thank the almighty God for the gift of life and for allowing me to walk this academic journey. I sincerely thank my supervisors, Dr. Rose Wambui Njihia, Lecturer, School of Education, Tangaza University and Dr. Michael Kimotho, Lecturer, Faculty of Education, The Catholic University of Eastern Africa, for their professional expertise throughout this research period. I thank the Little Sisters of St. Francis and, in a unique way, the Regional Superior and her council for allowing me to study and their financial support.

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ABSTRACT

The study aimed at examining how head teachers' transformative leadership strategies influence teachers' implementation of digital literacy tools for learning in public primary schools in Nakuru North Sub-County, Kenya. The study was guided by the following research objectives: to assess how head teachers' provision of ICT infrastructure influences teachers' implementation of digital literacy tools; to examine how head teachers' coordination of professional development affects teachers' implementation of digital literacy tools; to assess how head teachers' motivation strategies impact teachers' implementation of digital literacy tools; and to determine how head teachers' role modelling of digital literacy usage influences teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County. Transformational Leadership Theory and Technological Pedagogical Content Knowledge Theory were adopted for the study. The study adopted a convergent parallel mixed method design. The target population consisted of 44 schools, 44 head teachers, 350 teachers and 3654 students. Probability and Non-probability sampling techniques were used to select a sample size of 20 head teachers, 114 teachers and 322 students. The study used questionnaires, focus group discussion guide and in-depth interview guide to collect data. Validity of the Instrument was ensured through expert review and reliability was tested using Cronbach's Alpha. Descriptive statistics were used to analyse quantitative data while qualitative data was categorized and interpreted in narrative form and direct quotes. The findings revealed that the provision of ICT infrastructure, coordination of professional development, motivation and role modelling played a pivotal role in ensuring the implementation of digital literacy tools in schools. The study concluded that there is limited funding for the purchase and regular maintenance of devices, reliable internet connectivity, and training for both teachers and students regarding the use of ICT tools. The study recommends that the government through the ministry of education should ensure that schools are equipped with a long-term digital strategy, including creating specialized roles for IT support staff to ensure sustainable and efficient ICT integration in education. The head teachers should also prioritize regular professional development programs focused on digital literacy to equip teachers with the necessary skills and knowledge.

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ABBREVIATIONS AND ACRONYMS

BECF	Basic Education Curriculum Framework
DLP	Digital Literacy Program
KCSE	Kenya Certificate of Secondary Education
KICD	Kenya Institute of Curriculum Development
LDD	Learners Digital Devices
SPSS	Statistical package of Social Sciences
TPCK	Technological Pedagogical Content Knowledge
TSC	Teachers Service Commission
ICT	Information and Communication Technologies
NACOSTI	National Commission for Science Technology and Innovation
SCDE	Sub County Director of Education
TUREC	Tangaza University Research Ethics committee
ANOVA	Analysis of Variance
Do	Degrees of Freedom
SVG	Scalable Vector Graphics

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The transformative leadership style of school leaders has been reported to be vital for the effective implementation of digital literacy (Nalda et al., 2020). Transformative leadership has traits that help leaders influence their followers to achieve the desired institutional outcomes (Bukusi, 2020). Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies (UNESCO, 2018). Digital literacy consists of equipping people with information communication technology (ICT) concepts, methods and skills to enable them to use and exploit ICTs (ICT Development Report, 2010). Digital literacy skills are defined as open and dynamic processes dependent on interactive communication, which require knowledge to use ICTs (Kumar & Bhushan, 2020). Digital literacy is related to an individual's ability and expertise to access and use the technology needed to live, learn, and work in a society where communication and accessing information are the basis of functioning efficiently (Al-Omari, 2019).

Transformational leadership in educational settings involves leaders and followers collaborating to achieve organizational goals beyond their self-interests (Magasi, 2021). In the context of digital literacy implementation, transformational leadership can play a crucial role in facilitating the adoption of digital tools for learning. While the effectiveness of transformational leadership may vary across different organizational contexts, research suggests that it can be particularly impactful in educational institutions due to the collaborative nature of teaching and learning processes (Xie, 2020).

In Indonesia, Tatminingsih (2022) identified five critical areas for ensuring the effective implementation of digital literacy in schools as follows: The school leaders should embrace

ICT; they should use ICT in their teaching-learning activities and their administrative work; they should facilitate the change process for their teachers; and they should provide the necessary professional development opportunities for themselves and their staff. For school programs to be implemented efficiently, the school heads must act as models for the teachers. In Germany, Caena and Redecker (2019) found that teachers should obtain continuing professional development, available technologies and resources, and a positive culture to promote digital literacy effectively. Hence, it suggests that since teachers are supposed to model digital literacy when teaching learners, they should possess requisite digital literacy skills.

According to a study by A'mar and Eleyan (2022), in Palestine, school leadership is one factor determining the effectiveness of ICT in learning. In her study, Tołwińska (22021) who did a study in Poland about technology use in schools suggested that school leadership can be an empowering force that begins the process of using ICT in school teaching and learning. The study also noted that ICT in teaching and learning is one of the innovations that require transformative leaders. Teachers face several challenges that arise from implementing ICTs in school, and strong school leadership is required to assist teachers in overcoming these challenges.

Mendoza and Catiis (2022) conducted a study in the Philippines about the use of technology in schools. The study found that principals' technological leadership improves teachers' technological literacy and directly motivates them to integrate technology into their teaching for better performance. Learning to use technology increases a teacher's efficacy in the classroom, eventually resulting in digital literacy. In Turkey, Minaz et al. (2022), conducted a study aimed at examined how principals' transformational leadership positively impacted student achievement. The study revealed that principals' transformational leadership in Turkey

increased the proportion of student achievement. Teachers' technological literacy significantly improved due to the principals' cooperation.

Raza et al. (2023) conducted a study on transformational leadership for technology integration in schools in Switzerland. The study found that principals who were proficient in computers and practiced transformational leadership could effectively promote the adoption of ICT in their schools. They served as examples of how to employ technology in teaching and learning. This suggests that the principals were able to communicate a vision for integrating technology and foster a climate that would allow for the implementation of technology teaching.

Martens et al. (2020) asserted that teachers in Nigeria cannot use ICT effectively because of a lack of assistance. Teachers lacked the knowledge and assurance necessary to utilize technology. The study suggested that school administrators should encourage training for teachers to enable them to implement digital literacy. Guvhu (2018) studied principal leadership and integrating information and communication technologies for teaching and learning in Zimbabwe. The study results revealed that the principals had little knowledge of technology but were aware of their leadership role in supporting teachers to integrate ICT in teaching and learning. The head teachers should support the development of teachers to enable them to acquire the necessary skills to integrate technology into teaching.

Charles et al. (2021) researched the ICT integration strategies used in elementary school curricula in Uganda. The results of the study demonstrated that planning, coordination, and organization had a significant impact on the integration of ICT. The report proposed that government policies should be established to encourage teachers and school administration to integrate ICT into the teaching and learning process. The report also recommended examining management styles to ensure they can implement plans for successfully integrating ICT into the elementary school curriculum. Therefore, it is paramount for head teachers to be equipped

with transformational leadership skills to enable them to coordinate the implementation of digital literacy in their schools through the teachers.

The Digital Literacy Programme was initiated in 2016 in Kenya to provide digital devices to primary school pupils and enhance teachers' capacity to provide digital learning resources. The program made it possible to train about 81000 teachers. For instance, the Ministry of Education, Science and Technology and the Teachers Service Commission TSC focused on training teachers for ICT training to teach fundamental and advanced ICT skills (Government of Kenya, 2016). When first introduced, the Digital Literacy Programme's primary objective was to incorporate ICT in the education curriculum to enhance the efficient transfer of learning content in all the public primary schools in Kenya. The Basic Education Curriculum Framework (2017) outlines that one of the national learning objectives is to enhance social, economic, technological and industrial demands for the nation's development. To this end, the Kenya Institute of Curriculum Development, KICD, conducted a needs assessment study to determine the relevant competencies that should be attained. According to the need assessment conducted by KICD and in reference to the vision and Mission of BECF, digital competency is one of the competencies that a learner in basic education should achieve. These curriculum designs are also organized in a manner that every learner in primary school will, in a way, be exposed to some digital skills by the end of Grade six. These skills include coding, game-playing and word processing (KICD, 2017).

Muia (2021) noted that only a few teachers had ICT literacy in the ICT in the public primary schools in Kitui Central Sub-County. The study also revealed that several teachers and head teachers could not incorporate ICT in their instructions. Furthermore, there was no cordiality in the relationship between the teachers and head teachers. In the study by Muia, transformational leadership is not required to implement digital literacy.

Muchiri & Were (2016) affirmed a positive relationship between school leadership and ICT utilization in learning and teaching in Kenyan schools. This means that leadership is required for ICT to be embraced in teaching and learning and in the study conducted in Nakuru County, Salim and Onjure (2020) focused on the Effects of ICT Integration on the performance of digital literacy projects in the public primary schools. The study also found that restricted physical and Virtual networks, limited technical support, inadequate training and lack of adequate teacher competence hindered the digital literacy projects' performance in the Nakuru County public primary schools. The concerns identified in the study of Salim and Onjure were attributed to the absence of transformative leadership in digital literacy. Cherotich et al. (2022) looked at the effects of ICT infrastructure on digital literacy among teachers in in public primary schools within Nakuru County. The study ascertained that ICT resources are essential for adopting digital literacy. However, many schools lack the basic ICT facilities to support the introduction of digital literacy. Additionally, these schools were poorly equipped and, in some cases, the resources were scarce or deplorable. The study also proved that such issues hinder the proper coordination of ICT infrastructure for enhanced digital literacy.

Mahinda (2018) assessed the factors influencing the implementation of digital literacy programs in public primary schools in Nakuru North Sub-County. The study established that effective leadership is essential for facilitating the adoption of ICT in classroom teaching and learning. It suggested that headteachers must promote a digital culture to fully realize the goals of digital literacy. However, the study did not explore how headteachers' transformative leadership strategies impact teachers' implementation of digital literacy. Although various studies have examined the use of digital tools in education, there remains a scarcity of literature specifically addressing how headteachers' transformative leadership influences the implementation of digital literacy tools in public primary schools in Nakuru North Sub-County, Kenya. This gap highlights the need for the present study.

1.2 Statement of the Problem

Studies across the globe have demonstrated that school leadership plays a crucial role in promoting teachers' implementation of digital literacy in schools (Dashtestani & Hojatpanah, 2022; Nalda et al., 2020). Specifically, transformational leadership strategies among school heads have been found to positively influence teachers' use of information and communication technologies (ICT) for instructional purposes, thereby enhancing learning outcomes (Zainal & Mohd, 2021). In Kenya, the government has recognized the importance of school leadership in supporting the integration of digital literacy in schools. Initiatives such as training head teachers in digital and leadership skills have been implemented to improve teaching and learning through enhanced digital literacy (Ndegwa & Tanui, 2023).

Despite these efforts, concerns persist regarding the effectiveness of these measures in improving teachers' implementation of digital literacy tools for learning, particularly in Nakuru North Sub-County. According to a report from the Nakuru North Sub-County Director of Education, there is an outcry and worrying situation regarding implementation of technology tools in schools. Stakeholders, including parents, have raised concerns about teachers' effectiveness in utilizing digital literacy tools (Sub-county director report, 2025). The report indicates that many teachers lack adequate guidance, training, and motivation, which has led to poor implementation of digital tools, limited integration into classroom instruction, and diminished student engagement and development of digital skills.

As these challenges persist in the area, there is growing uncertainty about whether head teachers' transformative leadership strategies have contributed to the situation and whether a direct relationship exists between head teachers' transformative leadership strategies and teachers' implementation of digital literacy tools. There is concern if teachers' use of digital literacy tools continues to be ineffective, it could hinder students' acquisition of essential

technological skills, reduce engagement, widen the digital divide, limit learning opportunities, and leave learners ill-prepared for future academic and professional demands.

Furthermore, there is limited literature exploring the influence of head teachers' transformative leadership strategies and teachers' implementation of digital literacy tools, particularly in public schools within Nakuru North Sub-County. It is from this perspective that the current study seeks to address this gap by assessing how head teachers' transformative leadership strategies influence teachers' implementation of digital literacy tools for learning in public primary schools in Nakuru North Sub-County, Kenya.

1.3 Purpose of the study

This study aimed to assess the influence of head teachers' transformative leadership strategies in relation to teachers' implementation of digital literacy tools for learning in public primary schools in Nakuru North Sub-County, Kenya, with the view of identifying effective strategies to enhance digital literacy in schools.

1.4 Objectives of the Study

The following objectives guided the study:

i. To assess how head teachers' provision of ICT infrastructure influences teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County.
ii. To examine how head teachers' coordination of professional development affects teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County.
iii. To assess how head teachers' motivation strategies impact teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County.

iv. To determine how head teachers' role modelling of digital literacy usage influences teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County.

1.5 Research Questions

The study was guided by the following research questions:

i. How does the head teachers' provision of ICT infrastructure influence teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County?

ii. How does the head teachers' coordination of professional development influence teachers’ implementation of digital literacy tools in public primary schools in Nakuru North Sub-County?

iii. How do the head teachers' motivation strategies impact teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County?

iv. To what extent does head teachers' role modelling of digital literacy usage influence teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County?

1.6 Significance of the Study

The findings of this study have significant implications for various stakeholders in the education sector, particularly those involved in implementing digital literacy in primary schools. For the Ministry of Education, the findings provides valuable insights into the extent to which the Digital Literacy Programme has been effectively implemented since its introduction in 2016. This information could guide the ministry in developing policies and strategies to address any gaps or challenges identified, ensuring that the program achieves its intended goals of integrating ICT into the education curriculum.

The Teachers Service Commission (TSC) could benefit from the study's findings by understanding the importance of transformative leadership in driving the successful implementation of digital literacy. This knowledge can inform their evaluation and appointment processes for school head teachers, ensuring that individuals with the necessary transformative leadership skills are selected to lead primary schools effectively.

The study's findings could empower school head teachers, highlighting the significance of their transformative leadership strategies in influencing teachers' implementation of digital literacy. Concrete evidence of the positive impact of strategies such as motivation, role modelling, professional development coordination, and ICT infrastructure provision may enable head teachers to prioritize and refine these approaches, ultimately enhancing the adoption of digital literacy in their schools.

The study's findings could also inform the development of targeted professional development programs for teachers, addressing their specific needs and enhancing their digital literacy skills. By equipping teachers with the necessary knowledge and competencies, the quality of instruction may improve, leading to better learning outcomes for students.

Ultimately, the primary beneficiaries of this study would be the learners in primary schools. As teachers become more proficient in integrating digital tools into their teaching practices, students would experience enhanced learning facilitated by active learning, critical thinking, and deeper understanding and retention of content. This aligns with the national goal of promoting technological competencies for national development, as outlined in the Basic Education Curriculum Framework (2017).

By examining the role of transformative leadership in promoting digital literacy among teachers, this study would contribute empirical evidence to support the effectiveness of this leadership approach in educational settings, potentially influencing policy decisions and

resource allocation to foster an environment conducive to the successful integration of digital technologies in primary education.

The community could benefit by having schools that are digital compliance and therefore producing individuals who are competitive in the global education digital platforms.

1.7 Scope and Delimitations of the Study

The study assessed head teachers' transformative leadership strategies for implementing digital literacy in public primary schools in Nakuru North Sub-County. The current research focused on students, teachers and head teachers in Nakuru North Sub-County. Due to the study's emphasis on transformative leadership strategies, school heads, teachers and students were considered while other stakeholders such as non-teaching staff, parents were beyond the scope of the study because they were not in a position to give valuable information on headteachers transformative strategies. The study was delimited to Nakuru North Sub-county. Teachers were included since they are the ones who primarily implement digital literacy in schools and the students are the direct beneficiaries of the digital literacy program. Therefore leaving other headteachers strategies that could affect implementation of digital literacy.

The study concentrated on transformative leadership strategies that can affect the adoption of digital literacy, such as ICT infrastructure, teachers' professional development, motivation and role modelling in ICT.

1.8 Theoretical Framework

The Transformational Leadership Theory and Technological Pedagogical Content Knowledge Theory guided this study.

1.8.1 Transformational Leadership Theory

Burns (1978) originally put forth the transformational leadership theory, concerned with leadership that closely collaborates with followers to attain goals beyond their self-

interests. The leader recognizes the necessary change and develops a vision to direct it. Transformational leadership strives to encourage team members to be more creative and self-actualized. Burns (1999) identified four elements of transformational leadership: inspiration motivation, individual consideration, intellectual stimulation, and idealized influence.

Transformational leadership entails the leader's ability to identify and communicate a clear vision to inspire and motivate followers. Inspiring motivation involves pushing people to do better at their jobs and establishing a distinct vision for improving productivity. The head teachers may communicate the desired goals from the instructors, who may also reassure them that they are manageable.

The degree to which the leader is conscious of the requirements of the followers and responds by directing the followers is known as individualized consideration. Genuinely caring leaders take note of their followers' needs and emotions and practically respond to them. The needs of each teacher were identified by the head teachers, who then guides as necessary. For instance, it is essential to help individual teachers develop the skills needed to apply digital literacy through professional development.

In intellectual stimulation, the leader pushes followers to use their imagination and creativity to challenge the status quo. This characteristic is exhibited by leaders who promote innovation in their followers. Head teachers can use intellectual stimulation to encourage teachers to be innovative in incorporating technology into their lessons. As new teaching methods are introduced, teachers may become more enthused about their jobs.

Idealized influence occurs when a leader "walks the talk" and serves as an ideal role model for their followers. The transformational leader demonstrates the traits that their team wants from them. The principal can exercise tremendous influence by adopting a supportive stance toward using technology in the classroom. The principal can influence the teachers’

implementation of digital literacy by being at the forefront. In this regard, the head teacher should endeavour to acquire and apply ICT skills in their school administration.

Several studies agree that transformation leadership is crucial in a dynamic environment that calls for significant change and quick action (Martine & Fellenz, 2010). Studies by Kisoro, Gakuu and Kidombo (2011), Mandamus et al. (2012) and Ling (2013) revealed that although digital literacy instruction is expected to take place in Kenyan public primary schools, the integration of ICT into the curriculum is still a challenge. Teachers are required to be able to teach students how to use ICT since students are expected to do so.

Teachers' capacity must be increased to support the adoption of digital literacy. The key people to direct teacher performance and development are the head teachers. Although transformative leadership adheres to the established administrative framework, it empowers followers to be imaginative and creative. The effectiveness of teachers is crucial, and transformational leadership considerably facilitates the adoption of the necessary digital literacy.

The inclusion of the Technological Pedagogical Content Knowledge (TPACK) Theory in this study is justified by its focus on the intersection of technology, pedagogy, and content knowledge in educational settings. While Transformational Leadership Theory provides a framework for understanding leadership behaviours, TPACK offers insights into the specific knowledge domains required to integrate digital literacy tools in teaching effectively. This combination allows for a comprehensive examination of headteachers' leadership strategies and the technological-pedagogical competencies teachers need to successfully implement digital literacy tools for learning.

1.8.1.1 Strengths of Transformational Leadership Theory

The notion of transformation might serve as a compass for the head teachers. Ensuring that all educational policies are carried out correctly is one of the significant responsibilities of

the head teachers. This is only possible when school heads exercise leadership focused on influencing the intended result. The four pillars of transformational leadership, idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration can guide head teachers in dealing with teachers to change their behaviour toward the desired outcome, in this case, the adoption of digital literacy. The ministry of education is emphasizing the use of digital literacy in primary schools in liaison with the Competency-Based curriculum (CBC); hence, transformational theory gives strong backing to head teachers as they encourage teachers to implement the use of digital literacy.

1.8.1.2 Weakness of Transformational Theory

The theory does not offer a thorough framework for understanding how other parties contribute to accomplishing organizational goals. The leader is seen as the decisive factor for the followers' success, according to the elements of transformational leadership (idealized influence, inspiring motivation, intellectual stimulation, and individualized consideration). The theory depends on the leader influencing teachers to implement digital literacy. Still, it lacks a framework in which teachers contribute their ideas or give feedback, hence a lack of work spirit. In addition, the theory places significant emphasis on the charismatic qualities of leaders, which may not be consistently present in all leaders. Moreover, it relies heavily on the personal qualities and behaviours of the leader, which may not always be replicable or sustainable across different individuals or contexts.

1.8.1.3 Application of Transformational Leadership Theory to the Study

Head teachers can use the Transformational leadership theory to influence changes expected in the school to achieve the desired goals. The study envisions this leadership model as essential in implementing digital literacy through the teachers charged with impacting learners' knowledge.

Transformational leaders emphasize teamwork, which is essential in implementing

digital literacy to achieve education objectives. For the school to perform, they need a transformational head teacher s who empower teachers and inspire them to improve digital literacy in their schools. This enables teachers to give their very best and strive to realize the school's vision. Head teachers also encourage teachers to be innovative and work as a team to benefit the school's goals and objectives. Transformational leaders inspire and motivate their followers by providing a compelling future vision. Principals can articulate a vision for integrating digital literacy into teaching practices, emphasizing its importance in preparing students for the modern world. Transformational leaders pay attention to the individual needs and development of their followers. Principals can provide personalized support and resources to teachers based on their level of digital literacy skills, offering training sessions, workshops, or mentorship programs tailored to their specific needs. Transformational leaders serve as role models for their followers, earning their trust and respect. Principals can lead by example by actively engaging in digital literacy and demonstrating its value in improving teaching and learning outcomes since transformational leaders are proficient at driving organizational change. Principals can facilitate the implementation of digital literacy initiatives by involving teachers in the decision-making process, communicating the benefits of change, and addressing any concerns or resistance that may arise.

By applying the principles of transformational leadership, headteachers can effectively support teachers in integrating digital literacy into their teaching practices, ultimately enhancing the educational experiences and outcomes of students in public primary schools in Nakuru North Sub-County. While transformational leadership theory addresses the leadership dimension of the study, the Technological Pedagogical Content Knowledge (TPACK) theory was adopted to address the variable concerning the implementation of digital literacy. This dual-theoretical approach ensured that all key variables were comprehensively covered and discussed in the study.

1.8.2 Technological Pedagogical Content Knowledge Theory

Technological Pedagogical Content Knowledge (TPCK) theory was proposed by Shulman in 1986 and expanded later by Mishra and Koehler in 2006. TPCK is a technology integration model being developed to unveil how technology can be integrated into teaching to enhance learning. The idea behind the TPCK theory is to explain a set of knowledge that teachers require to teach learners effectively using technology (McGraw –Hill, 2019). Ruggiero and Mong (2015) point out that in the 21st century, technology plays a significant role as a tool that helps teachers in the delivery of lessons and shapes students learning.

Concerning this study, the theory holds that implementing technology in teaching requires knowledge that will be applied to achieve the desired outcome. Mishra and Koehler (2006) highlighted seven areas of teacher knowledge that serve as good teaching in implementing digital literacy: Pedagogical knowledge (PK), Technology knowledge (TK), Content Knowledge (CK), Pedagogical content knowledge (PCK), Technological pedagogical knowledge (TPK), Technological content knowledge (TCK) and Technological Pedagogical Content Knowledge (TPCK).

Pedagogical knowledge is about the knowledge methodology used in the classroom and contains knowledge on classroom management, evaluation, lesson progression and how the students learn. Technology knowledge refers to understanding the different technologies that exist and can be used for teaching and learning. Content Knowledge refers to the content of the subject to be taught and learned and is therefore critical because different subjects have different subject matter, which is the content. Pedagogical content knowledge refers to the understanding of the methodology to be used in class. This combines the content and methodology to improve the teaching practices in the content areas.

Technological pedagogical knowledge involves how different technologies can be used in teaching. It calls for the realisation that using technology may modify how teachers teach.

Technological content knowledge is about how technology can present knowledge in a new way. It proposes that teachers should get to know that using a specific technology alters the way learners practice and understand concepts in a given subject. Technological Pedagogical Content Knowledge refers to the knowledge teachers need to integrate technology into teaching content. This calls for teachers to understand the interaction between the three basic components of knowledge (content knowledge, pedagogical knowledge and technological knowledge) to be able to teach content using appropriate pedagogical methods and technologies.

The theory is used to interpret the ability of teachers to implement digital literacy based on their knowledge. The theory highlights the need for teachers to have all types of knowledge to be able to implement digital literacy. This theory helps integrate the three types of knowledge to apply technology in teaching. When technological pedagogical content knowledge theory is used, it makes it possible to implement digital literacy.

1.8.2.1 Strengths of Technological Pedagogical Content Knowledge Theory

The theory can motivate implementers of digital literacy to gain the necessary skills to make their job easier. The theory serves as a wake-up call that successful technology integration in teaching necessitates the integration of all concepts connected to teaching and learning. It also calls for an awareness of how content and pedagogy might be combined. TPCK aims to inspire teachers to have more profound expertise in instructing using technology.

1.8.2.2 Weakness of Technological Pedagogical Content Knowledge Theory

The theory strongly emphasises how content knowledge, pedagogical knowledge, and technological knowledge interact to determine if digital literacy is successfully implemented. Yet, the availability of technology tools that enable students' engagement in the classroom may also be a determining factor in the effectiveness of the implementation of digital literacy. These limitations may not have direct effect on the findings of the current research as its key emphasis

is on headteachers transformative strategies on implementation of digital literacy. However to guarantee that any flaws in the theory do not impact the study, the researcher would concentrate on the three aspect of TPCK theory that is content theory, pedagogical knowledge and technological knowledge.

1.8.2.3 Application of Technological Pedagogical Content Knowledge Theory to the Study

The rationale for anchoring this study on the Transformational Leadership Theory and the Technological Pedagogical Content Knowledge (TPCK) Theory lies in the complementary roles these theories play in addressing the successful implementation of digital literacy in public primary schools.

The Transformational Leadership Theory provides a framework for understanding how head teachers can effectively lead and influence their teams (in this case, teachers) to embrace change and achieve organizational goals. Specifically, transformational leadership strategies such as motivation, role modelling, professional development coordination, and provision of ICT infrastructure can inspire and empower teachers to adopt digital literacy in their teaching practices.

However, while transformational leadership can create an enabling environment for change, successful integration of digital literacy requires teachers to possess the necessary knowledge and skills to effectively utilise technology in their pedagogy. This is where the TPCK Theory becomes relevant, as it outlines the specific knowledge domains teachers need to develop to seamlessly blend technology, pedagogy, and content knowledge in their classroom instruction.

By combining these two theories, the study acknowledges that the successful implementation of digital literacy in public primary requires a two-pronged approach. First, head teachers must exercise transformational leadership to create a supportive and conducive environment for change, motivating and guiding teachers toward adopting digital literacy.

Concurrently, teachers must be equipped with the Technological Pedagogical Content Knowledge (TPCK) to effectively integrate technology into their teaching practices, ensuring that digital literacy is not merely a superficial addition but a meaningful enhancement to the learning experience.

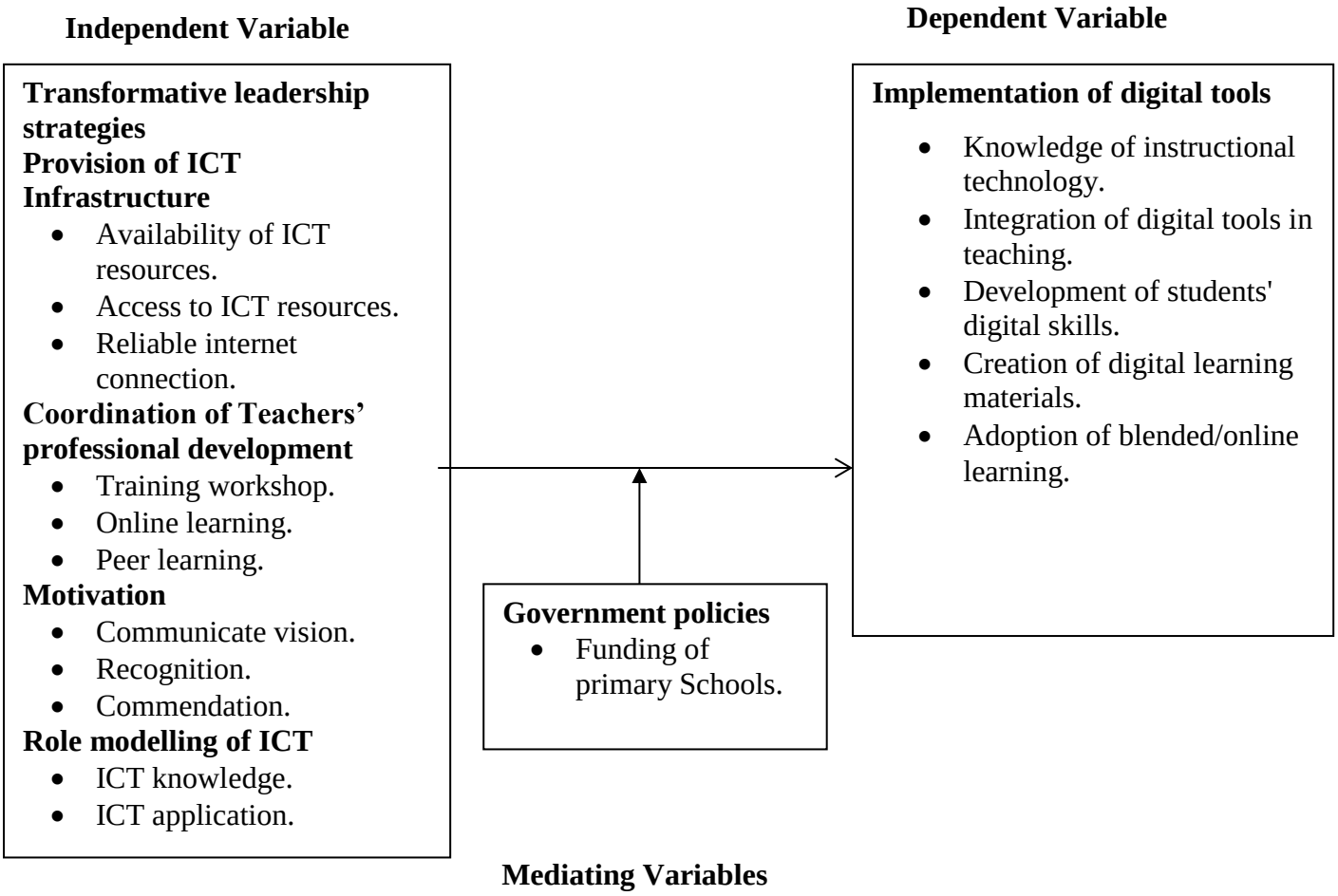
The complementary nature of these two theories provides a comprehensive theoretical foundation for the study. While the Transformational Leadership Theory addresses the leadership strategies and influence required to drive the adoption of digital literacy, the TPCK Theory focuses on the specific knowledge domains teachers must develop to implement digital literacy in their classrooms effectively.

Together, these theories offer a holistic perspective on the critical components necessary for successfully integrating digital literacy in public primary, accounting for both leadership and pedagogical considerations. By anchoring the study on these two well-established theories, the research aims to provide a comprehensive understanding of the interplay between transformational leadership strategies employed by head teachers and the development of teachers' technological pedagogical content knowledge, ultimately contributing to the effective implementation of digital literacy in the educational context.

1.9 Conceptual Framework

According to Kent et al. (2020), a conceptual framework represents a hypothetical model identifying the relationship between independent and dependent variables. Figure 1 illustrates the conceptual framework of this study.

Figure 1
Conceptual Framework of the Interaction of Head Teacher's Transformative Leadership and Implementation of Digital Literacy



In the conceptual framework depicted in Figure 1, head teachers' transformative leadership strategies are assumed to influence teachers' implementation of digital Literacy. In this study, transformative leadership strategies include motivation, role modelling of ICT, and coordination of teachers' professional development and provision of ICT infrastructure. Each of these strategies was assessed using different parameters. The provision of ICT infrastructure consisted of the head teachers' role in availing and ensuring teachers' access to ICT resources. Coordination of teachers' professional development included training workshops, online learning and peer learning. Motivation included head teachers' communication of vision, recognition of teachers and commendation for teachers. Role modelling of ICT by the head teachers was measured by ICT knowledge and ICT application. The framework shows that the provision of ICT infrastructure, coordination of teachers' professional development,

motivation and role modelling of ICT by the head teachers directly influence the teachers' knowledge of instructional technology and learner-centred approach to the learning process. Nevertheless, factors like government policies may modify this relationship.

1.10 Operational Definitions of Key Terms

Digital Literacy Tools: These are technological resources and applications used to access, create, manage, and communicate digital information in educational settings. In this study, the implementation of digital literacy is measured through the following indicators: teachers' knowledge of instructional technology, integration of digital tools in teaching, development of students' digital skills, creation of digital learning materials, and the adoption of blended or online learning.

Head Teachers' Transformative Leadership Strategies: These refer to the approaches employed by head teachers to inspire, motivate, and guide teachers toward the effective implementation of digital literacy tools. In this study, these strategies include coordination of ICT infrastructure, coordination of teachers' professional development, motivation, and role modeling of ICT use in teaching and learning.

Implementation of Digital Literacy Tools: This refers to teachers' use of digital technologies in their instructional practices to enhance student learning. It includes teachers' knowledge of instructional technology, integration of digital tools in teaching, development of students' digital skills, creation of digital learning materials, and adoption of blended or online learning.

Motivation: This refers to the deliberate actions, strategies, and practices employed by a head teacher to inspire, engage, and sustain high levels of enthusiasm, commitment, and performance among teachers. This includes recognition, appreciation, and commendation of vision and efforts related to ICT integration.

Role Modeling: This is the demonstration of effective use of digital literacy tools by head teachers in their administrative and instructional tasks. It involves imparting knowledge and practical application of ICT use among teachers.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter includes the literature that is most related to the objectives of this study. Literature reviews at the international, national, and local levels was identified for the four objectives of the study. It also highlighted any literature gaps that the study seeks to fill.

2.2 Head Teachers' Provision of ICT Infrastructure and Implementation of Digital Literacy

Akram et al. (2022) carried out a systematic review of existing literature published in the last five years in Pakistan, emphasising teachers' perceptions of the use of ICTs in teaching and learning at all levels of education. The authors point out that current advances in ICTs have forced learners into digital learners, requiring teachers to integrate ICTs into their practice. In this regard, the teachers' perception, technological content, and expertise are essential factors in technology implementation. The analysis of the current literature review reveals that Pakistani teachers generally share favourable attitudes toward the use of technology in their teaching-learning processes. They expect that integrating technology into their teaching improves their instructional methods, the learning experience, and the learners' motivation.

Nevertheless, the research also reported the following challenges that prevent teachers from integrating ICT optimally in their practice: slow internet connection, frequent power loss, lack of resources, limited experience in online teaching, and access to professional development. Therefore, the authors recommend that Pakistan's policymakers and education authorities establish policy guidelines and provide adequate financial resources to implement ICT in the educational systems effectively. This ranges from the availability of necessary facilities, technologies, application software, internet connection, and computerized laboratories. Furthermore, the study focuses on the need to encourage teachers to participate in

professional development activities that may assist them in acquiring the necessary IT skills that facilitates ICT integration for instruction.

One of the significant methodological strengths of the study is that the author has used a systematic review of extant literature to collate existing literature on teachers' perceptions and the challenges that may exist with the integration of technology in Pakistan. Nonetheless, this is an essential limitation of the study because it was conducted in the Pakistani context and might not be transferrable to other countries with different educational systems, practices, resources or cultural beliefs. Karunakaran and Dhanawardana (2023) explored the challenges and concerns social science teachers face in incorporating ICT in the teaching-learning process in the Sri Lankan context. The study was conducted in three education zones in Sri Lanka. Ten male and fourteen female junior secondary social science teachers were involved in online interviews. It was discovered that teachers experience difficulty acquiring technology in schools, and the quality of the technology differs from school to school. Besides, it was found that teachers encounter some problems in the teaching-learning process when employing ICT, including inadequate ICT types of equipment, excessive formalities in school governing policies, and the absence of workshops to fix damaged computers.

This study, therefore, highlights that educational officials and other relevant professionals should endeavour to address this problem in the school systems. The reviewed research highlighted ICT resource challenges, which are also a consideration for the current study. However, the reviewed study adopted online interviews to gather data from 24 teachers. Data for the current study was administered using questionnaires and interviews with students, teachers and head teachers.

Autor (2020) studied Ghana's Kwahu-West Municipality to determine how ICT infrastructure influences basic school social studies teachers' technology integration in their lessons. The survey was descriptive. The proportional simple random procedure was used to

pick a sample size of eighty-one (81) Junior High School social studies students from 46 public basic schools in Ghana's Kwahu West Municipality. The study employed questionnaires to obtain responses from the teachers. The analysis revealed that their school's ICT infrastructure heavily influenced basic school teachers' integration of technology in their social studies lessons. Through the Ministry of Education and other relevant stakeholders, it was recommended that the government ensure the provision of high-quality ICT infrastructure in elementary schools throughout the municipality. The findings from the reviewed study show that ICT infrastructure influences teachers' technological integration in the lessons they teach. The study sampled students and social studies teachers of junior high schools in Ghana as respondents and collected data through questionnaires. The current study sampled students, teachers and head teachers, using a questionnaire and interview guide to gather data. Questionnaires and interviews complemented the information collected from the respondents.

In Nigeria, Augustin and Kamaruddin (2018) examined the factors that determine the level of ICT integration by teachers in Aba North District Secondary Schools. The study employed a sample of 234 teachers from 20 secondary schools in Aba North District. Self-administered questionnaires were adopted as research instruments. Data was analysed using SPSS Version 22. The level of ICT competency of the teachers was moderate, with a mean score of 2. 87. Thus, a low level of ICT accessibility was observed with an overall mean of (M = 1. 69). Based on the findings of this study, the low frequency of ICT usage by teachers in the Aba North District secondary schools was attributed to no availability of ICT and poor ICT proficiency among the teachers. For effective ICT integration to be attained in Aba North District, teachers must be well-equipped with ICT and be very proficient in its usage. However, the study by Augustin and Kamaruddin (2018) was conducted in a different geographical context. As a result, another study is needed. Teachers only were selected and used as the respondents in the study and questionnaires only were used to gather data.

In their study in Kenya, Muchui et al. (2022) examined aspects related to a digital literacy programme in public primary in Isiolo County. The study adopted a descriptive survey research design and targeted 89 participants from 22 public primary schools practising digital literacy. It was founded on Innovation Diffusion Theory. The study involved 22 head teachers, 45 lower primary teachers and one Sub-county director of education, making up 68 respondents in the sample size. Primary data was gathered using questionnaires, while descriptive statistics were conducted using a statistical Package for Social Sciences Version 22 observation checklist. The study results showed that the level of DLP implementation was fairly low, at 42% and 4%; the results also reveal a strong positive relationship between ICT Infrastructure and DLP Implementation, with the same correlation coefficient index. About three-quarters of the instructors in this study reported that the digital literacy program was non-operational, with only 8. Nine percent of the respondents reported that their schools were active in DLP. Only 2% agreed that DLP was somewhat active, implying that the implementation of DLP is still very much minimal.

The report acknowledges that several strategies need to be employed to address the challenges hindering the levels of digital literacy program implementation during the early stages after deployment and it calls for collective efforts from all the stakeholders in the education sector. Based on the report, every school should have a functional ICT infrastructure with a well-equipped computer laboratory for all the students and the post of ICT teachers or technicians who would solve technical problems with the digital tablets for hire. Exploratory research conducted by Muchui et al. (2022) showed that ICT plays an important role in influencing digital literacy. However, the study was conducted in Isiolo County; therefore, another study is required. Hence, the current study aims to determine whether head teacher's provision of ICT infrastructure impacts teachers' use of digital literacy in primary schools in Nakuru North Sub–County, Kenya.

In Kenya, Okello et al. (2020) aimed to determine the preparedness of ICT facilities in public primary in the Waitaluk division to support the Digital Literacy Programme and also to determine whether public primary schools in Waitaluk division Trans-Nzoia County have adequate ICT technical personnel for implementing the Digital Literacy Programme. The study adopted a descriptive survey design. In this study, the sampling technique used was purposive sampling, which targeted five head teachers, 35 regular teachers, and ten pupils. Self-administered questionnaires and observation checklists were employed in data collection. The study confirmed a lack of infrastructure and human resources preparation to conduct a digital literacy programme. The study under discussion gives insight into insufficient infrastructure implementation of digital literacy; however, the research was conducted in Trans-Nzoia County, so it is necessary to conduct a study in another county. The current study, therefore, seeks to conduct a study in public primary in Nakuru County. Wanjiku (2022) sought to establish the availability and deployment of ICT in English teaching and learning in public secondary schools in Nakuru County.

The study's theoretical framework was developed from the constructivism approach by John Dewey. The research employed a mixed research method and a survey research design with a descriptive research aim. The study's respondents were 336 administrators, 672 English teachers, and 6,800 three (3) students. Admittedly, questionnaires, interview guides, and observation schedules were administered to elicit responses from the respondents. The study also found inadequate ICT resources available for incorporation in English teaching and learning in Nakuru County secondary schools. From the list of ICT facilities used in schools, computers, television, radios, and mobile phones were frequently used, mainly for the preparation of exams and teaching listening, respectively. The most common applications of ICT in English lessons were pronunciation, information sourcing, listening, and vocabulary teaching. The study also discovered that the use of ICT in English instruction was hampered

by a lack of ICT training, a lack of enough sockets in the classroom, a lack of overall limited ICT resources in school, and a lack of software when needed. The study revealed that insufficient ICT resources in public secondary schools in Nakuru County were challenging but failed to explain who was accountable for the problem. This study sought to determine whether head teachers' provision of ICT infrastructure influences teachers' implementation of digital literacy in public primary schools in Nakuru North Sub-County.

2.3 Head Teachers' Coordination of professional development and Implementation of Digital Literacy

In Spain, Fernández-Batanero et al. (2020) studied Digital competencies for teacher professional development. The method follows the Statement Guidelines for Systematic Reviews and Meta-analysis (PRISMA). After applying the inclusion, exclusion, and thematic belonging criteria in Scopus and Wos databases, the sample comprised 21 studies. The selected studies emphasize the importance of digital competence as one of the challenges facing teachers today, being mainly qualitative methodology studies. Among the conclusions, we highlight that most of the selected studies reveal a lack of teacher training and insufficient ICT training. The study under discussion used secondary data to establish the link between professional development and ICT integration. The current study intends to collect primary data from head teachers, teachers, and students using interviews and questionnaires.

A study by Yelubay et al. (2022) from Asia sought to establish the effectiveness of developing future teachers' digital competence through massive open online courses. The study used a mixed method. The primary data was collected through questionnaires. The findings of this study revealed that massive open online courses as a distance learning technology effectively improved teachers' digital competence. The study by Yelubay et al. (2022) was conducted in a different geographical setting and did not show the role of the head teacher in teachers' professional development and the implementation of digital literacy. The current

study intends to determine whether training workshops organized by the head teachers' impact teachers' implementation of digital literacy in public primary in Nakuru North Sub-County, Kenya.

Chama and Subavaeera pandiyan's (2023) study sought to investigate the difficulties experienced in teaching digital capabilities to secondary school students in Zambia. The data was collected from a sample of 281 teachers and 20 schools in Lusaka. The findings show that while teachers in Zambia have access to digital devices and have moderate to high levels of digital literacy, there is a challenge to incorporate technology into the curriculum and instruction effectively. The study recommended professional development programs for teachers to improve their digital competencies to address the challenge. Though the study established that there is a challenge to incorporate technology into the curriculum and instruction effectively and recommended professional development programs for teachers, it failed to give the specific coordination role of the school leadership. The reviewed study also collected data from teachers only. This leaves a gap the proposed study sought to address by exploring head teachers' coordination of teachers' professional development. It involved students, teachers, and head teachers from public primary schools in Nakuru North Sub-County, Kenya.

Ngoungouo (2017) carried out a study in Cameroon to identify the types of ICTs utilized by teachers, as well as to assess the status of equipment in those schools and the level of teacher training in the use of ICTs in teaching. A questionnaire was used to collect data from 21 teachers. According to the findings, 14.28% of the teachers were trained on the use of ICT instructions, while 85.75% were not. Furthermore, the said teachers acquired the knowledge by their initiative through online learning platforms on the internet. The study, therefore, revealed that teachers desired to be trained, hence the need for professional development. The study by Ngoungouo (2017) established that only three out of 21 teachers undertook online

ICT training. However, the study did not state clearly whether the trained teachers effectively used ICTs for instructional purposes. Further, the study used a sample of 21 teachers, a small sample representing a large population. Thus, the current study intends to collect data from 105 teachers.

Kirchhoff and Makubuya (2022) explored sustainable teaching practices to meet the Kenyan government's call for innovative learning and to teach digital literacy to all students. They were selected from Trans Nzoia County preschool, primary, and secondary school teachers attending a three-day professional development course. The study findings confirmed that while the participants were satisfied with the training, they also complained of inadequate technology resources. It was a challenge for them to teach digital literacy in a constructivist fashion, as was expected of them.

Matthew et al.'s (2016) research in Kenya focused on the effects of enhancing literacy instruction by expanding the teacher knowledge base. The study occurred in the coastal area, and the teachers were educated on developing lessons for the semi-scripted plans and the weekly text-messages to help students read results and classroom practices. The sample comprised 51 public primary schools and the schools were selected randomly. It was also pointed out that there were more written text instructions and an immense focus on letters and sounds. After two years, there are positive effects on three out of four fundamental indexes of children's literacy, and school drop-out reduces from 5. This makes the approach to literacy training both sustainable and cheap; in the subsequent years, a similar approach has been embraced across Kenya.

In Nakuru County, Mbugua (2015) conducted a study to investigate the impact of ICT integration in teaching on students' academic performance in public secondary schools in Nakuru County, Kenya. The descriptive survey research design was used in this study. The study sampled 81 principals and 405 teachers to participate in the study. Data were collected

using teacher questionnaires, an interview schedule for Principals, and a school Observation Schedule to appropriately capture the impact of ICT integration on teaching and student performance. The findings revealed that teachers had only basic or no ICT skills, which posed challenges for teachers to integrate ICT into teaching. The reviewed study provides important insights into the teachers' ICT skills and how they can be developed. However, this study was carried out in public secondary schools. The current study proposes to assess whether head teachers' coordination of professional development influences teachers' implementation of digital literacy in Nakuru North Sub–County primary schools.

2.4 Head Teachers' Motivation Strategy and Teachers' Implementation of Digital Literacy

Self-motivation also requires the leader to communicate the school's goals and the expected achievements (Maponya, 2020). Yamamoto and Yamaguchi (2019) conducted a study on the relationship between ICT adoption in schools and the aspect of transformational leadership in Mongolian elementary schools in Japan. Particularly, it focused on leadership aspects concerning four aspects of transformational leadership (Charisma or idealized influence, Inspirational motivation, Intellectual stimulation, and individualized consideration). Furthermore, correlation analysis was used to determine how these factors are associated with the implementation of ICT at schools in Mongolia, which includes school leaders' perceptions concerning the use of ICT in class teaching and funding for ICT training. The survey targeted 222 school leaders from five regions of the country. The analysis of the findings revealed that the component of inspirational motivation plays a particularly crucial role in ICT use in the context of classroom teaching. Interactions that foster creativity are positively related to teachers' integration of ICTs in instructions and funding for ICT training for teachers.

Furthermore, the results give credit to the applicability of transformational leadership to ICT implementation at the school level in the Mongolian context. The study is highly

relevant to the current study; nevertheless, it used a correlational quantitative research design. However, the current study employed a convergent parallel mixed-methods design, in which both quantitative and qualitative data are collected and analysed simultaneously. This approach made the findings more reliable and generalizable since they came from different sources.

The quantitative study by Ying and Alias (2021) focused on the head teachers and the application of technology leadership in Malaysian schools. Participants were 202 elementary school instructors who filled out questionnaires. The survey findings revealed that both head teachers' technology leadership and teacher's technology utilisation for the teaching-learning process were very high. The study also concluded that teachers are easily encouraged to integrate technology into the teaching and learning process when they are encouraged by their head teachers to practice and implement it. Despite the valuable information generated from this study, this study only used quantitative data, which may have restricted the information retrieved. This study used a mixed methodology to understand better teachers' views and lenses on head teachers' motivation strategies and their influence on digital literacy practices.

Nyamubi's (2021) study in Tanzania examined how headteachers can enhance performance by motivating teachers to use ICT in secondary schools. The target population comprised four secondary schools in two districts in the Rukwa Region of Tanzania. The data was collected through a questionnaire, and the data analysis involved descriptive statistics. The findings showed that the head teachers rewarded the teachers who implemented the use of ICT in teaching and learning; further, the results showed a relationship between the principal's motivation and the teachers' work output. Despite the valuable information gleaned from this study on motivational strategies employed by head teachers, the study was conducted in a different geographical region and in a different academic setting from the current study that involves state primary schools in Kenya. Further, Nyamubi (2021) conducted a study on only four secondary schools, and therefore, the sample size is quite small. However, this study was

conducted on 44 public primary school head teachers, teachers, and students. That is why the larger and more diverse sample was sought to improve the findings' validity in the local environment's specific context.

In the study “Determinants of Teachers’ Motivation and Professional Development in Public Secondary Schools in Kenya” by Orina, Kiumi, and Githae (2022), the authors explored the factors that influence teachers’ motivation in public secondary schools in Kenya. The study involved 255 teachers randomly selected from 752 teachers in public secondary schools in Kwale County. Data were collected through a self-delivered questionnaire and analyzed using arithmetic mean and multiple regression analysis. The study found that the factor with the highest impact on teachers’ motivation was opportunities for career progression (mean=3.720; [beta]=0.238), followed by compensation (mean=3.477; [beta]=0.175), recognition (mean =2.489; [beta]=0.0168), performance appraisal (mean =2.410; [beta]=0.120), training opportunities (mean=2.388; [beta]=0.075), and lastly work environment (mean =2.053; [beta]=0.041). These six predictor variables accounted for 81% of the total variation in teachers’ motivation. While the study provides valuable insights into the factors influencing teachers’ motivation, it primarily relies on questionnaires for data collection. This approach may not capture the full complexity of teachers’ experiences and perceptions. Furthermore, the study does not explore the relationship between teachers’ motivation and their adoption of digital literacy, which could be a significant factor in today’s increasingly digital educational landscape. To build on the findings of Orina, Kiumi, and Githae (2022), future research could employ a mixed-methods approach, incorporating both questionnaires and interviews, to gain a more nuanced understanding of teachers’ motivation. Additionally, investigating the impact of digital literacy on teachers’ motivation could provide valuable insights for policy and practice in Kenya’s education sector.

Nalda et al. (2020b) conducted a study to explore the concept of digital instructional leadership and its impact on perceived student learning in online settings. The study was conducted in the context of the COVID-19 pandemic, which forced education systems to embrace remote schooling and online learning, thereby changing the role of principals from face-to-face interaction to digital leadership.

The researchers used new and adapted measures to investigate principals' digital instructional leadership, its mechanisms of operation, and its outcomes. Specifically, the study examined how digital instructional leadership affects perceived student learning in online settings through teachers' intrinsic motivation for digital instruction (as a mediator). The study sample included 380 teachers from Bahrain. The study's results supported the mediating role of teachers' intrinsic motivation for digital instruction in the relationship between digital instructional leadership and perceived student learning in online settings. While the study was exploratory with limited scope, its concepts, measures, and findings offer valuable contributions to research and practice.

In Nakuru County, Njoroge (2017) sought to determine whether the expense of ICT infrastructure, school visions, and teachers' ICT skills hinder the effective implementation of ICT policy in public secondary schools in Naivasha Sub-county. The researcher used an ex post facto research strategy, in which data was obtained utilizing a questionnaire for 32 head teachers of public secondary schools and a structured interview for the Quality Assurance and Standard Officers (QASO) from the Naivasha Sub-county Educations office. The study's findings implied that the implementation of ICT policy in schools is dependent on the school's ICT vision, where the school strategic plan has a clear vision and strategy for implementing ICT rather than the cost of ICT infrastructure or teachers' ICT skills. The reviewed study provides insights into the importance of school vision on digital literacy, which corresponds to the current study; however, it was conducted in secondary schools in another Sub-county in

Nakuru. The current study examined how head teachers' communication of vision of digital literacy impacts teachers' implementation of digital literacy in Nakuru North Sub – County."

2.5 Head Teachers' Role Modeling and Teachers' Implementation of Digital Literacy

"Thannimalai and Raman (2018) conducted a cross-sectional study in Malaysia to establish the correlation between Principals' Technology Leadership and Teachers' Technology Integration. For this study, 90 principals and 645 Kedah National Secondary Schools teachers were selected through systematic random sampling. The principals were assessed using the Principals Technology Leadership Assessment (PTLA) and National Education Technology Standards –Administrator (NETS) of 2009, and the teachers were administered learning with ICT. The study affirmed that the technological leadership of principals is associated with teachers' use of technology. This study's findings revealed a relationship between principals' technological leadership and teachers' technology integration; this study was done in Malaysia, a country located in a different geographical location from the current study. The study was also conducted in national secondary schools. The current study concentrated on Kenyan public primary schools to address these research gaps.

Antia and Dioso (2023) conducted a study in the Philippines to determine the effects of digital literacy on school heads and leaders. The ICT background knowledge of school heads was assessed using a questionnaire that aimed to ascertain knowledge of electro technologies and computer programs. Self-administered questionnaires solicited information from 30 school heads and 200 teachers. The work showed that school heads' digital literacy played a crucial role in their performance in the school. Although the study's findings offer important information for the current study, it was carried out in a different geographical context. Therefore, conducting another study in a different context is desirable to see whether there is an echo. Hence, this research analysed how head teachers' ICT role modelling affects teachers' use of digital literacy in primary schools in Nakuru North Sub – County.

Argaw et al. (2022) employed a study to examine the effects of technology-supported instruction on the effectiveness of teachers in catholic secondary schools in Ethiopia. The study adopted an explanatory sequential mixed-methods research design. A target population of 240 teachers, 263 pupils, 11 school heads, and four supervisors was selected using proportionate stratified sampling and the finite sampling technique. Data was obtained through questionnaires and an interview guide. This analysis suggests that the higher the level of teachers' competence, the higher their impact on the technological support of instruction. The study showed teacher's competency as one of the factors that led the teacher to integrate the use of technology in teaching, which led to the use of digital literacy. There is no conclusive evidence in the study which may show the extent to which the head teachers' technological knowledge affects the teachers' use of technology for instruction. This study, therefore, sought to fill this gap by focusing on how the head teachers model the teachers' implementing digital literacy.

Arkorful et al. (2020) conducted a study in senior high schools in Ghana to determine the extent of ICT integration in teaching. This study employed a descriptive survey design and a quantitative research approach. It was a census which involved 83 teachers in the school. The information was collected using self-completed survey forms for the study subjects. The data received were analysed using descriptive statistics and inferential statistics. The study established a significant relationship between the teachers and the use of ICT. The study was done at different levels of schools and in various geographical areas. Moreover, it was mainly concerned with teachers' perceptions and usage of ICT in instruction. The current study sought to centre on how headteachers' knowledge and use of ICT affect teachers' adoption of digital literacy.

This study investigated the relationship between school heads' technological leadership and teachers' integration of information and communication technologies (ICT) in instruction

in public elementary schools in Quezon, Philippines. The study by Alayan (2022) utilized a quantitative research design with descriptive-correlational methods. The participants included 248 elementary school teachers from the Division of Quezon. Data was collected using survey questionnaires that measured school heads' technological leadership capabilities and teachers' levels of ICT integration in their classroom instruction. The results showed that school heads in Quezon exhibited a high level of technological leadership across the dimensions examined, such as vision, staff development, resource allocation, and monitoring/evaluation related to ICT integration. Teachers' levels of ICT integration in instruction were also found to be high overall. The study found a significant positive correlation between school heads' technological leadership and teachers' ICT integration. This suggests that principals who demonstrate strong technological leadership skills can positively influence and enable greater adoption of ICTs by teachers in their classroom practices. The study highlights school leaders' critical role in facilitating and promoting technology integration initiatives in schools. It provides empirical evidence that principals who develop a clear vision, provide training, allocate resources, and monitor ICT use can create an environment for teachers to overcome barriers and integrate digital tools more extensively in teaching and learning processes. A strength of the study is its relatively large sample size of 248 teachers across multiple elementary schools. However, being confined to just one division/district is a limitation in terms of generalizing the findings more widely. Future research across broader contexts would strengthen the evidence base.

This study by Mwita et al. (2022) aimed to investigate the effects of teachers' competency-based curriculum (CBC) training on their implementation of the new curriculum in grades 1-3 in public primary in Migori County, Kenya. The study employed a descriptive survey design methodology. The target population included 604 head teachers, 1812 grade 1-3 teachers, and eight sub-county quality assurance and standards officers across all sub-counties in Migori County. The sample consisted of 180 head teachers, 544 grade 1-3 teachers,

and all eight sub-county officers, resulting in a total sample size of 732 participants. Data was collected through questionnaires for teachers and head teachers and interviews with the sub-county officers. The researchers established the validity and reliability of the instruments through expert reviews, pilot testing, and calculation of Cronbach's alpha coefficients.

The key findings revealed that most (56.77%) of the teachers had attended CBC training sessions, and 59% agreed to be well-versed with the training themes/content. The study highlighted the importance of teacher training and preparedness for successfully implementing the competency-based curriculum in Kenya's early grade levels of primary education. A strength of the study is its relatively large sample size across multiple sub-counties, enhancing the generalizability of the findings within the Migori County context. Using various data sources (teachers, head teachers, officers) provides a more comprehensive understanding. However, the study is limited in its descriptive survey design and Migori County focus, restricting broader generalizability across Kenya. Future studies could employ more rigorous experimental or quasi-experimental designs and expand to other counties/regions. The findings underscore the need for continued investments in robust teacher training programs aligned with curriculum changes."

2.6 Summary of Literature and Research Gaps

The literature review explored various studies on the influence of head teachers' motivation strategies on teachers' implementation of digital literacy in educational settings. Several studies, such as those conducted by Yamamoto and Yamaguchi (2019) in Japan, Ying and Alias (2021) in Malaysia, and Nyamubi (2021) in Tanzania, highlighted the positive impact of head teachers' motivational approaches, including articulating a clear vision, providing recognition and praise, and fostering a supportive environment, on teachers' integration of information and communication technologies (ICT) in their teaching practices.

These studies consistently found that when head teachers effectively motivate their staff through inspirational leadership, collaborative opportunities, and incentives, teachers are more likely to embrace and incorporate digital literacy initiatives. The studies also emphasized the importance of transformational leadership style components of inspirational motivation, intellectual stimulation, individualized consideration and idealized influence in facilitating the successful implementation of ICT in schools.

Furthermore, the review included studies from different educational contexts, such as Mukumbi and Kabeta's (2019) research in Zambia, which explored the challenges faced by head teachers in motivating teachers in public secondary schools, and Orina, Kiumi, and Githae's (2022) study in Kenya, which examined various factors influencing teachers' motivation, including opportunities for career progression, compensation, recognition, and training opportunities.

While these studies provided valuable insights into the role of head teachers' motivation strategies in promoting digital literacy implementation, several gaps were identified. Upon reviewing the literature, significant gaps were found. A contextual gap was revealed in the studies by Yamamoto and Yamaguchi (2019), who conducted research in Japan, while Nyamubi (2021) conducted research in Tanzania. Owing to the different geographical settings, their findings may not be generalized to how the adoption of digital literacy and the transformational leadership strategies of Kenya's Nakuru North Sub-County's head teachers affect each other. Methodological limitations in different studies were evident. For example, Ying and Alias (2021) used a purely quantitative design in their research, which may have limited the information gathered. The current study used quantitative and qualitative designs, enabling the study to gather more comprehensive information. Additionally, a study by Ngoungouo (2017) selected only 21 teachers as respondents, a relatively small sample

compared to the current research. The current study intends to collect data from 322 students, 114 teachers, and 20 head teachers, providing a larger and more representative sample size.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The research design, location of the study, target population and sample size, sampling procedures, instruments used in data collection, reliability and validity of the instruments, data analysis methods, and ethical considerations are outlined in this chapter.

3.2 Research Design

This study adopted a mixed methods approach, specifically; the study adopted a convergent parallel mixed method design. This design involves gathering both quantitative and qualitative data during the same stage of the research and combining the results of the two data sets to analyse the research issue. In the convergent parallel mixed method design, the study's quantitative and qualitative aspects are considered equally essential and performed simultaneously and separately (Akash & Aram, 2021). "For example, the current study utilized questionnaires to collect quantitative data and interview guides to gather qualitative insights from the study participants.

Both data sets are collected and analysed in parallel, employing standard quantitative and qualitative data analysis methods. Namely, a one-phase design where both the quantitative and the qualitative data were collected and analysed. After the testing phase, the results from the two strands are compared and contrasted during the interpretation phase (Dawadi et al., 2021). This approach was used in this study because it enables the researcher to compare qualitative and quantitative data and provide an extensive understanding of the research problem (Bangi, 2018; Creswell, 2014).

The rationale for employing this design is to have different but related information set on the same subject to understand the research issue fully. At the interpretation stage, the findings from both strands were integrated and analysed to give a holistic perspective of the

research issue. This is because the approach facilitates triangulation of results and provides a richer understanding of the extent to which head teachers' transformative leadership strategies and their influence on the implementation of digital literacy.

3.3 Location of the Study

This study was conducted in Nakuru North Sub-County which is located in the central part of Nakuru County, Kenya. It is bordered by Nakuru Town East and Nakuru Town West to the south, and extends towards the northern parts of the county. The sub-county encompasses three zones that is Bahati,Solai and Ndundori which is known for its agricultural activities. The implementation of digital literacy tools among teachers in this area has been a challenge, and there appears to be very scanty literature that clearly explains the exact cause of teachers' difficulties in implementing these tools, which has raised the need for the current study to be conducted in the area.

3.4 Target Population

According to Stratton (2021), the target population is a group with characteristics the researcher seeks to investigate. The target population for this study consisted of 44 public Primary schools, 44 head teachers, 350 teachers, and 3,654 students. Head Teachers were included because they are key decision-makers and implementers of school policies. Their leadership strategies directly influence the adoption of digital tools. This helped in assessing how their actions support or hinder digital literacy integration. Teachers were included in the study because they are the primary users of digital literacy tools in classrooms. Their experiences, challenges, and levels of implementation provide essential insight into how head teachers' leadership strategies impact teaching practices. Students are the end-users and beneficiaries of digital literacy in learning. Their feedback offers valuable perspectives on the effectiveness of digital tools in enhancing learning outcomes and teacher-led technology integration.

3.5 Description of Sample Size and Sampling Procedures

A sample is a subset of individuals drawn from a larger population (Rahman et al., 2022), and it is used to draw conclusions about the broader population. Sampling procedures refer to the methods used to select participants from a population for inclusion in a study (Clark et al., 2021). This study employed both probability and non-probability sampling techniques.

3.5.1 Sampling of Schools

The researcher used a simple random sampling technique to select the public primary schools that participated in the study. This sampling technique was adopted for the study because all public primary schools in Nakuru North Sub-County are mixed and day, which makes them homogeneous. To select the schools that took part in the study, the researcher got a list of all the public schools from the sub-county director of education in Nakuru North Sub-County, which consisted of 44 public primary schools. The researcher then used scorecards labeled with the numbers 1 and 2, which were placed in a container, and the researchers then randomly picked the scorecards, and the schools corresponding to scorecards labeled **'1'** were selected to participate in the study. This sample size represented 45% of the targeted schools which was 19.8 schools and the researcher rounded off to 20 schools. This proportion was appropriate for the study, following the recommendation of Soper (2023), who suggests that for small populations (fewer than 100), sample sizes of 30–50% or more are recommended to achieve adequate statistical power. Therefore, the sample size of 45% was adequate for the study.

3.5.2 Sampling of Head-Teachers

All the head-teachers from the selected schools were automatically included in the study. The head teachers were included in this study because they run the schools on the daily basis and their leadership decisions, support, and vision directly influence teachers' motivation, resource allocation, and effective implementation of digital literacy tools in schools.

3.5.3 Sampling of Teachers

The study involved 114 teachers drawn from 20 selected public secondary schools. The number of teachers selected from each school was proportionate to the total number of teachers in that school. The following proportional sampling formula, as outlined by Yamane (1967), was used to determine the sample size.

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

Whereby:

n= is the sample size

N= is the size of the population (159)

e= is the desired level of confidence (0.05)

The sample size was computed as follows:

$$n = \frac{159}{1 + 159 \times 0.05^2}$$

$$n = \frac{159}{1 + 0.3975}$$

$$n = \frac{159}{1.3975}$$

$n = 113.8$ (Rounded to 114)

Therefore, the calculated sample size for teachers was 114.

Stratified random sampling was used to select 114 teachers from 20 public primary schools in Nakuru North Sub-County, with the number of teachers chosen from each school being proportionate to its total teacher population. To ensure gender representation, both male and female teachers were included. The selection involved teachers randomly picking folded papers marked 'Yes' and 'No'; those who pick 'Yes' participated in the study.

3.5.4 Sampling of the Students

The study involved 322 students drawn from 20 selected public primary schools. The number of students selected from each school was proportionate to the total number of students in that school. The following proportional sampling formula, as outlined by Yamane (1967), was used to determine the sample size.

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

Whereby:

n= is the sample size

N= is the size of the population (1661)

e= is the desired level of confidence (0.05)

The sample size was computed as follows:

$$n = \frac{1,661}{1 + 1,661 \times 0.05^2}$$

$$n = \frac{1,661}{1 + 4.1525}$$

$$n = \frac{1,661}{5.1525}$$

$n = 322.37$ (Rounded to 322)

Therefore, the calculated sample size for students was 322.

This sample was distributed proportionately among the 20 sampled schools based on student populations. Within each school, systematic random sampling was used to select the required number of students. Table 1 provides a summary of the target population, sampling techniques, and sample sizes for the different groups in this study:

Table 1

Target Population, Sampling Technique and Sample Size

Group	Target Population	Sampling Technique	Sample Size
Schools	44	Simple random sampling technique	20
Head-Teachers	44	Automatic inclusion	20
Teachers	350	Proportionate stratified sampling	114
Students	3,654	Proportionate systematic random sampling	322

3.6 Description of Research Instruments

Data collection instruments are tools used in research to collect various types of data, which are then processed and organized systematically (Creswell, 2018). In the current study, data collection instruments included questionnaires for teacher, in-depth interview guides for head teachers, and focus group discussion guide that were used to collect data from students. The study further used observation checklist to collect data that was useful in understanding the problem under study.

3.6.1 Questionnaires for Teachers

The questionnaire for teachers contained both open-ended and closed-ended questions. It consisted of five sections: Section A sought demographic information on teachers, including gender, age and teaching experience. These demographic variables are included as they may serve as potential control variables or provide contextual information relevant to the study. Section B sought to gather information on how head teachers' provision of ICT infrastructure influences teachers' implementation of digital literacy tools. Section C sought information regarding how head teachers' coordination of professional development affects teachers'

implementation of digital literacy tools. Section D sought information about how head teachers' motivation strategies impact teachers' implementation of digital literacy tools. Finally, section E provided data regarding how head teachers' role modelling of digital literacy usage influences teachers' implementation of digital literacy tools in public primary in Nakuru North Sub-County. This instrument is attached in Appendix C.

3.6.2 In-depth Interview Guide for Head Teachers

Data from the head teachers of the selected schools were collected using an interview guide. The interview questions were formulated as a set of general questions that the head teachers were able to address in detail. Section A aimed to obtain data on the demographic information of the head teachers, including level of education and the experience. Section B contained questions that sought information on how head teachers' provision of ICT infrastructure influences teachers' implementation of digital literacy tools. Section C sought information regarding how head teachers' coordination of professional development affects teachers' implementation of digital literacy tools. Section D sought information about how head teachers' motivation strategies impact teachers' implementation of digital literacy tools. Finally, section E provided data regarding how head teachers' role modelling of digital literacy usage influences teachers' implementation of digital literacy tools in public primary in Nakuru North Sub-County. This instrument is attached in Appendix D.

3.6.3 Focus Group Discussion for Students

A Focused Group Discussion (FGD) in research is a qualitative data collection method where a small group of people are guided through a structured conversation about a specific topic (Nyumba, 2018). For this study, focused group discussions were conducted with students. The Focused Group Discussion guide contained questions intended to collect information regarding the demographic information of the students, such as their gender and age. The guide also had questions seeking information on how head teachers' provision of ICT infrastructure

influences teachers' implementation of digital literacy tools; how head teachers' coordination of professional development affects teachers' implementation of digital literacy tools; how head teachers' motivation strategies impact teachers' implementation of digital literacy tools; and finally the questions intended to collect data regarding how head teachers' role modelling of digital literacy usage influences teachers' implementation of digital literacy tools in public primary in Nakuru North Sub-County. This instrument is attached in Appendix E.

3.6.4 Observation Checklist

An observation checklist was used to evaluate key aspects of teachers' implementation of digital literacy tools. This checklist, consisting of items designed to assess factors such as the use of digital tools, teacher proficiency, student engagement and use of digital tools, lesson delivery, support and resources, and assessment and feedback. It provided structured feedback and support for teachers' efforts to effectively integrate digital tools into their teaching practices. This instrument is attached in Appendix F.

3.7 Validity of Quantitative Instruments

Validity refers to the extent to which a research instrument accurately measures what it is intended to measure (Sürücü & Maslakçi, 2020). To ensure the validity of the quantitative instruments (questionnaires), the researcher focused on establishing content validity and face validity.

Content validity refers to the degree to which the items or questions in an instrument comprehensively cover the domain or content area being measured (Kholis et al., 2020). To establish content validity, the researcher consulted experts in educational leadership from Tangaza University and the supervisors. These experts reviewed the questionnaire items to ensure they adequately cover the crucial elements of the study variables and align with the research objectives. Their feedback was used to refine and improve the instruments, ensuring that the content was comprehensive and relevant to the study's aims.

Face validity refers to the extent to which an instrument appears to measure what it is intended to measure based on a subjective assessment by experts or the target population (Mason et al., 2020). The researcher can also assess face validity by involving experts from relevant fields in the review process. The experts evaluated whether the items and overall structure of the questionnaires measured the intended constructs related to head teachers' transformative leadership strategies and teachers' implementation of digital literacy.

Establishing content and face validity through expert review is crucial in ensuring the accuracy and appropriateness of the quantitative instruments used in this study. It enhanced the overall validity of the findings and conclusions drawn from the research, contributing to the study's significance and practical implications for stakeholders in the education sector.

3.8 Pilot Testing of Quantitative Instruments

Pilot testing refers to conducting a small-scale preliminary study or trial run to assess the proposed research methods and instruments' feasibility, effectiveness, and potential challenges (Aschbrenner et al., 2022). It involves administering the research instruments to a smaller subset of participants similar to the main study's target population.

To maintain the integrity of the primary study sample, a pilot study was conducted in two public primary schools in Nakuru North Sub-County before the main study to enhance the reliability of the research instruments. These two schools were excluded from participating in the main study. This approach ensured that the pilot study did not compromise the primary study sample while allowing for the refinement of research instruments and procedures. The pilot study included 10% of the calculated sample size for teachers and students from schools outside the main study area (Hashim et al., 2022).

3.9 Reliability of Quantitative Instruments

Reliability, as defined by Aithal and Aithal (2020), refers to the consistency and stability of a research instrument in measuring the intended construct or characteristic. It is the

extent to which an instrument produces consistent results when administered under similar conditions or to similar groups of participants. In this study, the reliability of the quantitative data was assessed using the split-half technique. The researcher administered a questionnaire consisting of 10 items, and a Cronbach's alpha value of 0.787 was obtained (See Appendix G). According to Shrestha (2021), a generally accepted threshold for Cronbach's alpha is 0.7 or higher. This allowed the researcher to conclude that the questionnaire was reliable and, therefore, suitable for data collection.

3.10 Credibility, dependability and Trustworthiness of Qualitative Instruments

The level of confidence in data interpretation and methods used to guarantee a research study's quality is the trustworthiness or rigour of a study (Connelly 2016). According to Gunawan (2015), trustworthiness is judged by credibility, dependability, transferability and confirmability. Credibility refers to participants' perceptions of what the researcher portrays regarding what they think, feel, and do, while dependability refers to the stability and steadiness of data over time. Confirmability is the accurate representation and interpretation of the information that participants provide without the interference of the researcher (Elo et al., 2014). Transferability is the extent to which the findings of one study can be helpful in other different contexts determined by those who wish to compare their studies (Connelly, 2016; Shenton, 2004). This study used triangulation to ensure the data is trustworthy. According to Stahl and James King (2020), triangulation uses numerous data sources from the field to establish recognizable patterns. In addition, the researcher sought confirmation and consistency from the interviewees.

3.11 Description of Data Collection Procedures

The researcher sought approval from the Tangaza University Directorate of Postgraduate Studies and Research through an authorisation letter. This letter was used to seek permission from the National Commission for Science, Technology, and Innovation

(NACOSTI) to conduct the study. Upon receiving approval, the researcher visited the Nakuru County Director of Education Office, the Sub-County Director of Education and the County Commissioner to seek additional clearance. The researcher visited the schools and presented the official documents acquired from the relevant offices.

Following this, the researcher informed the head teachers, teachers, and students about the nature of the study and sought their consent by completing a consent form. The research assistant distributed to the teachers the questionnaires while the researcher conducted interviews with the head teachers and the focus group discussion with students.

3.12 Data Analysis Procedures

The study employed both quantitative and qualitative data analysis procedures, aligning with the mixed-methods approach. The quantitative data collected from the questionnaires were analysed using descriptive statistics specifically frequencies and percentages which were processed using the Statistical Package for Social Sciences (SPSS). The qualitative data obtained mainly from the in-depth interviews with head teachers and focus group discussion with students were analysed using thematic analysis.

The analysis process involved transcribing the interviews to ensure an accurate representation of the data. Initial codes were generated and themes were identified based on the patterns and insights emerging from the data. These themes were reviewed and refined to ensure coherence and distinctiveness, ensuring they accurately captured the essence of the qualitative data. The final themes were defined and named, reflecting the critical insights derived from the analysis. The qualitative findings were presented as narratives and direct quotations, which helped to provide rich and contextual understanding of the research problem.

3.13 Ethical Considerations

Research ethics as a term identifies a system of moral standards which is focused on the correspondence of the procedures that are used in the research to the promises that were

given to the participants on the professional, legal, and social levels (Žydžiūnaitė, 2018). Any research that involves contact with people must be ethically regulated to ensure that participants do not undergo unpleasant occurrences, abuse, or physical violence. Ethics is when one acquires permission from the respondents, values the subjects under study, and does not harm them. Privacy, concealment, and nondisclosure were discussed (Surmiak, 2020). Before the researcher collected data from the participants. The researcher secured an introduction letter from Tangaza University and consent from the National Commission for Science, Technology and Innovation (NACOSTI).

The researcher sought permission from the County Commissioner, County Director of Education and the Sub- County Director of Education. The researcher got Informed consent from the individual respondents before conducting the study. The participants were informed what was expected of them to participate in the survey, and were further requested to sign a consent form. Participants were assured of their privacy, anonymity, and confidentiality rights. The respondents were informed that they had the right to opt out of the study if they so wished. In the study, the researcher minimized interference with the participants, ensured that the participants were not misled about the purpose of the study, and finally, respected the study participants by not disclosing their identity. Matula et al. (2018) state that plagiarism entails passing another person's work, ideas, and thoughts as one's own work. Thus, to eliminate cases of plagiarism, the researcher cited both primary and secondary sources of information as per APA 7th edition.

CHAPTER FOUR

PRESENTATION, INTERPRETATION AND DISCUSSION OF THE FINDINGS

4.1 Introduction

This chapter presents the findings of the study on head teachers' transformative leadership strategies and their influence on teachers' implementation of digital literacy tools in public primary in Nakuru North Sub-County, Kenya. The results are organized according to the research questions as stated in chapter One. The chapter begins with an analysis of the response rate and the demographic characteristics of the participants. It then presents the data analysis based on the research questions, utilizing descriptive statistics, primarily frequencies and percentages, which are presented in tables, graphs, and pie charts

4.2 Instrument Return Rates

The research instruments were administered to different study participants. These included questionnaires distributed to teachers and interviews conducted with head teachers. Additionally, focus group discussions were organized with students. Table 2 shows the response rates of the study participants.

Table 2

The Response Rate of the Study Participants

Participants	Sampled Participants	Actual Participants	Return rate (%)
Head-Teachers	20	20	100.00
Teachers	114	114	100.00
Students	322	318	98.76

Source: ***Field Data (2025)***

As shown in Table 2, the study achieved exceptionally high return rates across all participant groups. Both head teachers and teachers had a 100% response rate, with all 20 head teachers being available for interviews and 114 teachers returning their completed questionnaires. The students had still impressive response rate of 98.76%, with 318 out of 322 being available for focus group discussions. These high return rates significantly exceed the

generally accepted threshold of 60% for social science research (Fincham, 2008). Moreover, they surpass the more stringent recommendation of 80% proposed by Singleton and Straits (2005) to ensure the representativeness of the sample.

The 100% response rate from head teachers and teachers is particularly noteworthy, as it ensures that the perspectives of all sampled school leaders and educators are represented in the study. This comprehensive participation provides a solid foundation for drawing meaningful conclusions about the influence of head teachers' transformative leadership strategies on the implementation of digital literacy tools in the target schools. It must be noted however that despite the high response rate, some gaps in response rates were observed. For instance, some four students were not available to fill in the questionnaire for unexplained reasons. The high response rate was attributed to several factors, including, the relevance of the research topic to the participants' daily experiences in education, effective communication of the study's importance to respondents, clear and concise questionnaire design, appropriate timing and administration of the survey as well as effective follow-up procedures which enhanced the willingness of the participants to take part in the study.

4.3 Demographic Characteristics of the Participants

This research aimed to investigate the individual characteristics of the participants, including age, sex, gender, professional qualifications, and teaching background. Understanding the demographic profile of the study participants is essential for interpreting their ratings regarding headteachers' transformative leadership strategies on teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County, Kenya.

4.3.1 Demographic Characteristics of Teachers

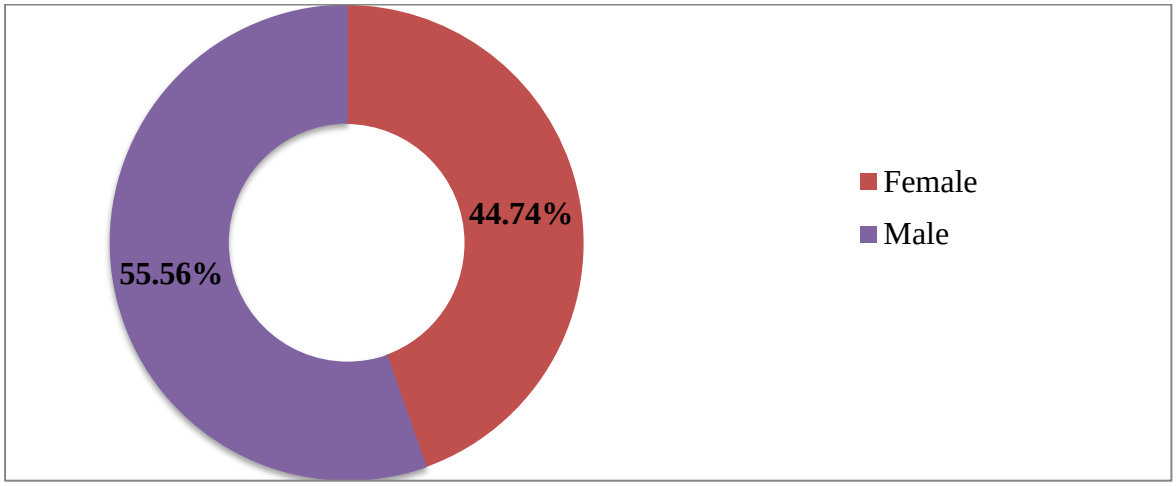
The study examined the demographic characteristics of the teachers, focusing on their distribution by gender, age, and highest professional qualification. This was done to determine whether teachers' personal characteristics have a bearing on their ratings of headteachers' transformative leadership strategies in relation to the implementation of digital literacy tools in public primary schools in Nakuru North Sub-County, Kenya.

4.3.1.1 Distribution of Teachers by Gender

The study examined the gender distribution of teachers participating in the research, which provided valuable insight into the demographic composition of the teaching staff in public primary schools in Nakuru North Sub-County, Kenya. This information is crucial for understanding potential gender-related influences on the implementation of digital literacy tools in education. Figure 2 presents the findings.

Figure 2

Distribution of Teachers by Gender



The findings revealed that out of the 114 teacher participants, 55.56% were male and 44.74% were female, indicating a relatively balanced gender representation among the teaching staff, with a slight predominance of male teachers. This gender balance strengthens the validity of the study, as it ensures that the perceptions of both male and female educators are adequately

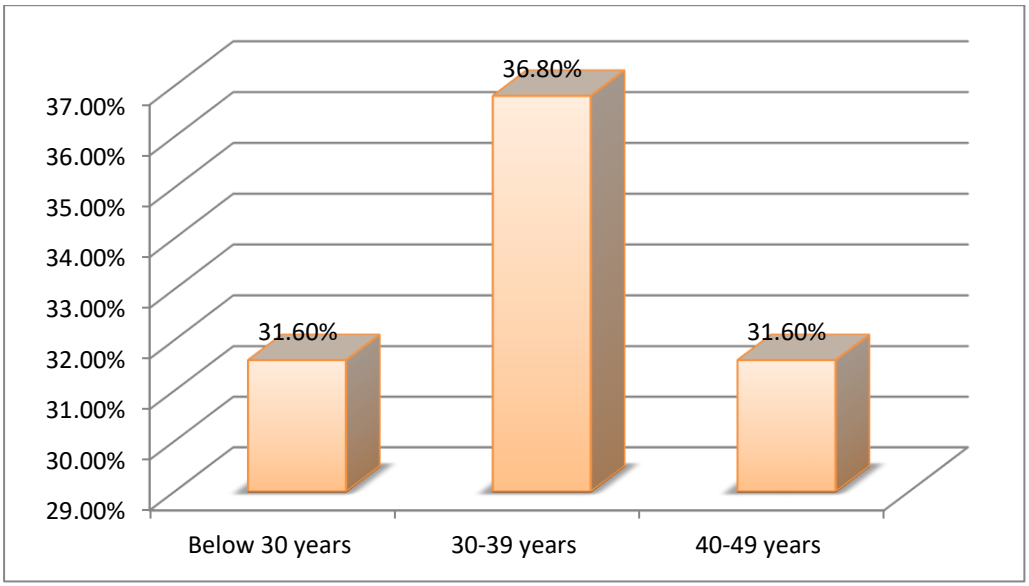
captured, an important factor when evaluating headteachers' transformative leadership strategies and their impact on digital literacy implementation. Research has shown that gender can influence teachers' attitudes toward and engagement with educational technology (Teo et al., 2015), which in turn may affect how they respond to leadership strategies aimed at integrating digital tools into teaching. The male majority also reflects broader patterns in some developing countries, where men are often more represented in the teaching profession at certain levels (UNESCO, 2017). Nonetheless, the near-equal representation observed in this study suggests ongoing progress toward gender parity in the region, which is critical in fostering inclusive and effective implementation of digital literacy tools under transformative leadership.

4.3.1.2 Distribution of Teachers by Age

In this section, the study sought to ascertain the respondents' ages to see if age was related to teachers' responses to the head teachers' transformative leadership strategies on teachers' implementation of digital literacy tools for learning in public primary schools in Nakuru North sub-county, Kenya. The summary of the findings is presented in Figure 3.

Figure 3

Percentage Distribution of Teachers by Age



Source: ***Field Data (2025)***

The findings indicated that the largest group of teachers (36.8%) were aged between 30 and 39 years, while the remaining participants were evenly distributed between those under 30 years and those aged 40 to 49, each comprising 31.6% of the sample. This relatively young to middle-aged teacher population reflects a diverse workforce that includes both recent graduates and more experienced educators. Such age diversity has implications for the implementation of digital literacy tools, especially under the guidance of transformative leadership. Younger teachers may be more technologically adept due to recent training and exposure, while older teachers contribute pedagogical depth and institutional knowledge that can support the effective integration of digital tools. Headteachers employing transformative leadership strategies, such as individualized support, inspirational motivation, and intellectual stimulation, must therefore tailor their approaches to accommodate the varying levels of technological familiarity and openness among staff. This aligns with existing research suggesting that teacher age plays a role in technology adoption in education (Inan & Lowther, 2010), underscoring the importance of adaptive and inclusive leadership in promoting digital literacy across generational lines.

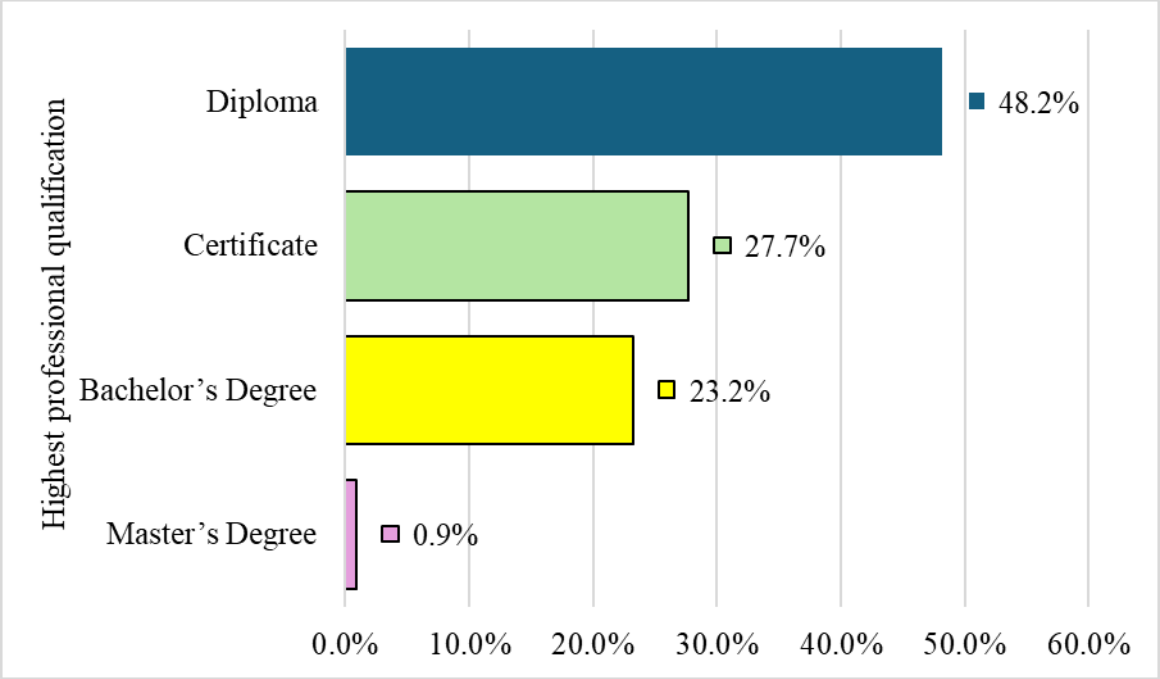
4.3.1.3 Distribution of Teachers by Highest Professional Qualification

Figure 4 illustrates the distribution of teachers by their highest professional qualification. This was done to provide insight into the educational background of the teaching staff and how it relates to their rating of headteachers' transformative leadership strategies and the implementation of digital literacy tools in public primary schools in Nakuru North Sub-County, Kenya.

Figure 4

Percentage Distribution of Teachers by Highest Professional Qualification

Source: ***Field Data (2025)***



The results revealed that the majority of teachers (48.2%) held a Diploma as their highest professional qualification, followed by 27.7% with a Certificate, 23.2% with a Bachelor's degree, and only 0.9% with a Master's degree. This distribution suggests that while most teachers have received professional training beyond the basic certification level, a relatively small proportion have attained higher academic qualifications. This has important implications for the implementation of digital literacy tools, particularly in the context of head teachers' transformative leadership strategies. Research has shown that teachers with higher qualifications are more likely to effectively integrate technology into their teaching (Buabeng-Andoh, 2012). Therefore, head teachers employing transformative leadership, through practices such as intellectual stimulation and individualized support, must recognize the varying levels of academic preparedness among their staff. By adapting their leadership approaches to support teachers across different qualification levels, headteachers can foster a

more inclusive and effective environment for digital literacy integration in public primary schools in Nakuru North Sub-County.

4.3.2 Demographic Profile of Head Teachers

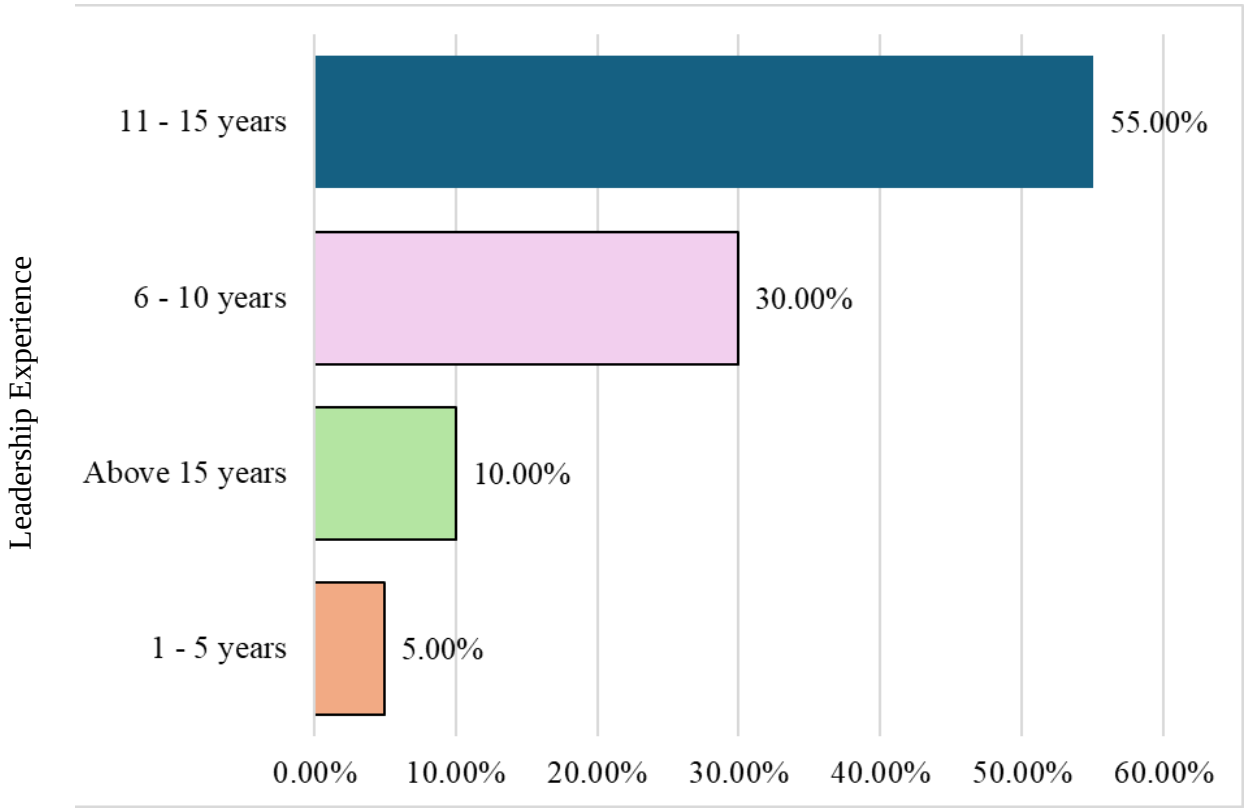
The demographic profile of head teacher was analyzed in the study. The analysis focused on three key aspects: years of experience, gender distribution, and the highest education level attained. These demographic factors were considered crucial in understanding the characteristics of the head teachers who participated in the study. The following sections present and discuss the findings for each of these demographic variables.

4.3.2 .1 Distribution of Head Teachers by Years of Leadership Experience

The study examined the experience of the head teachers who participated in the research. This demographic factor was considered important as it could influence the head teachers' leadership styles, decision-making processes, and overall school management approaches. Figure 5 presents the percentage distribution of head teachers based on their years of leadership experience.

Figure 5

Percentage Distribution of Head teacher's Leadership Experience



Source: ***Field Data (2025)***

The results revealed that the majority of headteachers in the study had substantial leadership experience. Specifically, 55% had served as headteachers for 11 to 15 years, while 30% had 6 to 10 years of experience. Only 10% had more than 15 years of experience, and a small proportion (5%) had between 1 and 5 years in the role. These findings suggest that most headteachers in the study possess considerable leadership experience, which is a key factor in shaping effective school management practices. This supports the findings of Woo et al. (2022), who observed that headteachers with extensive leadership experience tend to have a more comprehensive understanding of educational processes and challenges. In the context of this study, the predominance of experienced headteachers may positively influence the implementation of digital literacy tools through the application of transformative leadership strategies. Experienced leaders are more likely to inspire, support, and guide teachers through technological transitions by drawing on their practical knowledge and professional maturity. Consequently, their ability to articulate a clear vision, motivate staff, and adapt to evolving

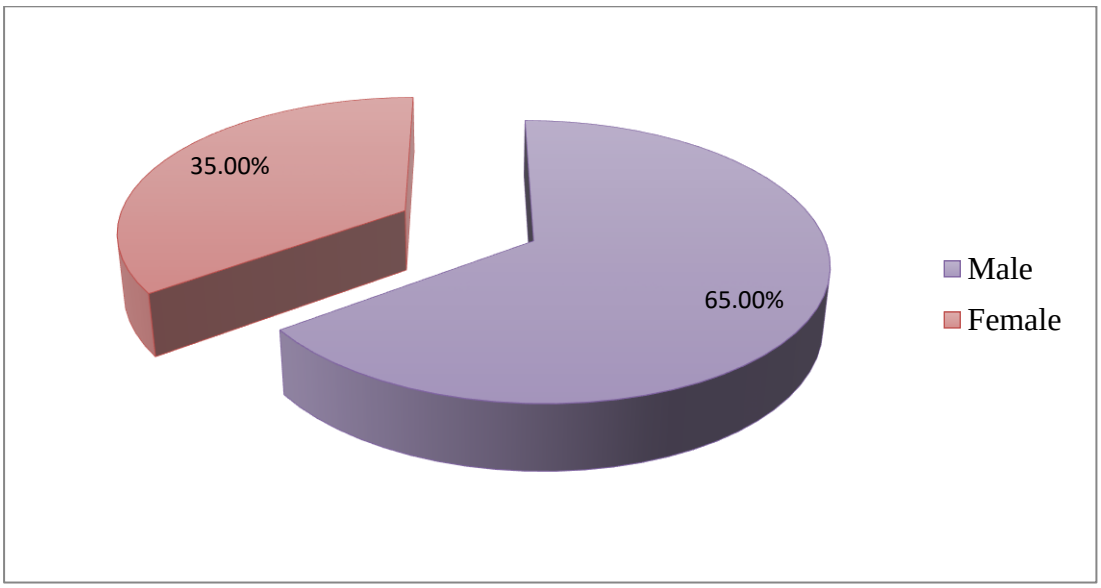
educational demands can significantly enhance the integration of digital literacy in public primary schools in Nakuru North Sub-County.

4.3.2 .2 Distribution of head Teachers by Gender

The study investigated the gender distribution among the head teachers. This demographic factor was examined to understand the representation of male and female head teachers in the study. Figure 6 illustrates the percentage distribution of head teachers by gender.

Figure 6

Percentage Distribution of Teachers by Gender



Source: ***Field Data (2025)***

The analysis of gender distribution among head teachers revealed a notable disparity, with male head teachers comprising 65% of the respondents and female head teachers making up 35%. This imbalance reflects a broader global trend of gender disparities in school leadership, as highlighted by Shakeshaft et al. (2020), who reported similar patterns across various educational contexts. In the context of transformative leadership and the implementation of digital literacy tools, this gender gap may have implications for leadership diversity and inclusivity. Research suggests that diverse leadership teams bring a range of

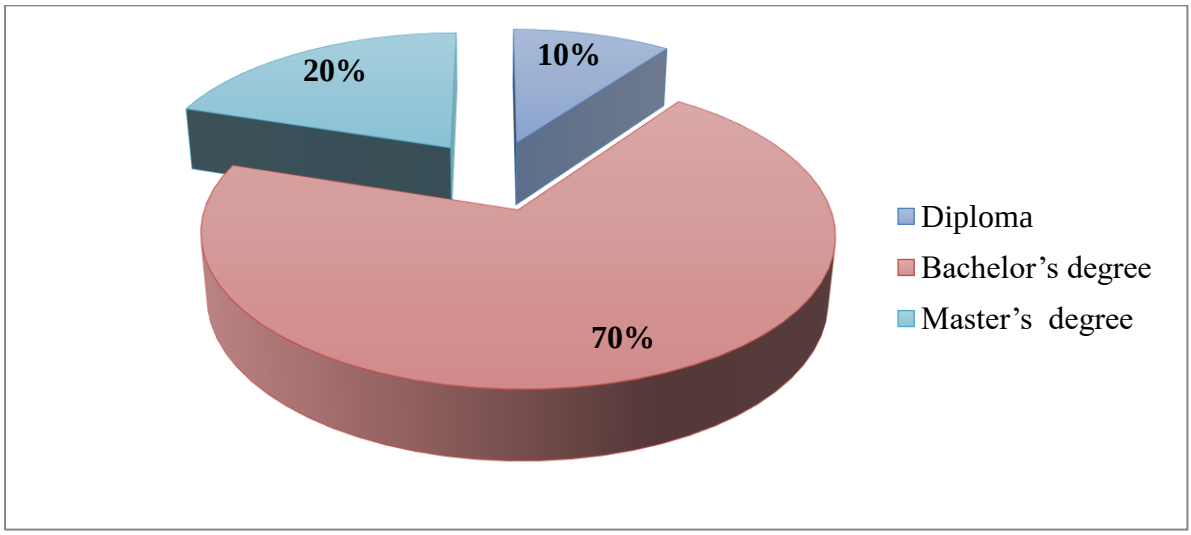
perspectives and approaches to problem-solving, communication, and innovation, key elements in driving technology integration in schools. A gender-balanced leadership could enrich the implementation of digital initiatives by accommodating different leadership styles and fostering a more inclusive school culture. While the current distribution in Nakuru North Sub-County may reflect historical and systemic patterns, addressing such disparities could contribute to more equitable and effective school leadership, particularly in the digital age where innovation and adaptability are essential.

4.3.2.3 Distribution of Head Teachers by Highest Education Level

The educational qualifications of head teachers were another important demographic factor examined in the study. The highest education level attained by the respondents was considered a key indicator of their academic preparation for leadership roles. Figure 7 presents the percentage distribution of head teachers based on their highest educational qualifications.

Figure 7

Distribution of head teachers by Qualification



Source: ***Field Data (2025)***

The analysis of educational qualifications revealed that the majority of head teachers in the study held advanced degrees, with 70% having attained a bachelor's degree and 20% holding master's degrees. Only 10% of the respondents had a diploma as their highest qualification. These findings reflect a high level of academic preparation among school leaders, aligning with Freeman and Fields (2023), who highlighted the growing trend of higher educational attainment among head teachers. This strong academic foundation may enhance the effectiveness of transformative leadership strategies, as highly educated head teachers are more likely to be familiar with contemporary pedagogical theories, technological integration frameworks, and evidence-based decision-making. Such qualifications can support the strategic planning and implementation of digital literacy tools in schools, enabling leaders to guide their staff with both credibility and competence. However, while formal education contributes significantly to leadership capacity, it is essential to recognize that successful implementation of digital literacy also depends on other leadership dimensions, such as vision, motivation, and adaptability. Thus, combining advanced qualifications with transformative leadership qualities positions head teachers to effectively lead the integration of digital tools in public primary schools in Nakuru North Sub-County.

4.4 Head teachers' Provision of ICT Infrastructure and Teachers' Iimplementation of Digital Lliteracy

The study aimed to assess how head teachers' provision of ICT infrastructure influences teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County. Teachers were asked to indicate their opinions on a five-point scale, as shown in Table 3, which included the following options: Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA).

Table 3

***Head teachers' Provision of ICT Infrastructure and Teachers' implementation of digital literacy* (N=114)**

Statement	SD		D		N		A		SA	
	F	%	F	%	F	%	F	%	F	%
There are enough computers/laptops for us to use in our school.	9	7.9	24	21.1	31	27.2	34	29.8	16	14.0
We have a good internet connection in our school for learning.	38	33.3	37	32.5	17	14.9	4	3.5	18	15.8
Our school has projectors that teachers use for teaching.	43	37.7	31	27.2	2	1.8	13	11.4	25	21.9
The computers and other ICT tools in our school work well.	5	4.4	31	27.2	17	14.9	40	35.1	21	18.4
We can easily access computers when we need them for learning.	14	12.3	16	14.0	12	10.5	43	37.7	29	25.4
The ICT tools in our school help us in teaching and learning process.	2	1.8	17	14.9	12	10.5	45	39.5	38	33.3

Source: ***Field Data (2025)***

As indicated in Table 3, most of the teachers (29.8%) and (14.0%) agreed and strongly agreed respectively with the statement that they have enough computers or laptops for use in their schools. Additionally, 27.2% of the teachers were undecided, while 7.9% strongly disagreed with the statement. These findings suggest that head teachers in public primary schools in Nakuru North Sub-County are making efforts to coordinate the provision of ICT infrastructure, which supports the implementation of digital literacy tools in schools. This is consistent with the views expressed by one of the head teachers, who stated:

> As a head teacher, I try my best to ensure that teachers in my school have what they need for implementing digital tools. As such, we have worked to ensure the school gets

enough computers and projectors for teaching, which has helped improve the use of ICT in our school (Head Teacher 2, 14/03/2025).

A similar sentiment was shared by another head teacher, who acknowledged the challenges of acquiring digital literacy tools, but noted that they had managed to secure a few computers for teachers to use in teaching. Data from the observation checklist also supported these findings, showing that a few schools had an adequate number of computers and tablets available for use by teachers in the teaching and learning process. Likewise, data from students revealed that in many schools, head teachers had made efforts to acquire computers and laptops for instructional use. For instance, one student shared, "We recently received new computers in our lab, which has significantly improved our learning experience. We no longer have to share computers as we did before, since we now have more available."

These findings align with previous research highlighting the importance of ICT infrastructure in supporting digital literacy. For example, Ghavifekr et al. (2016) found that adequate ICT infrastructure is crucial for the successful integration of technology in teaching and learning. This study's results suggest that, while head teachers in Nakuru North Sub-County are making significant efforts to provide ICT resources, there is still room for improvement, especially in the provision of digital tools for teaching and learning.

Regarding internet connectivity, most of the teachers (33.3%) and (32.5%) strongly disagreed and disagreed respectively regarding the statement that their schools have good internet access. Only a few teachers (3.5%) agreed. Data from most students confirmed this finding, as many reported facing challenges in accessing the internet during their studies. However, head teachers generally believed that internet connectivity was not a major issue in their schools. One head teacher explained:

I understand that equipping schools with digital literacy tools presents significant challenges, especially with limited resources. However, in our school, we have made

> deliberate efforts to provide essential resources such as computers and reliable internet connectivity. These foundational tools have significantly enhanced the teaching and learning experience, enabling both teachers and students to embrace digital learning more confidently and effectively (Head Teacher 3, 13/03/2025).

The findings indicate a significant gap between teacher and student experiences versus the perspectives of some head teachers regarding the availability and use of projectors in schools. The study further revealed that majority of teachers (37.7%) and (27.2%) strongly disagreed and disagreed respectively with the statement that projectors are available for teaching in their schools, and only a minimal number (1.8%) were undecided. This suggests a widespread perception among teachers that projectors are either unavailable or not being used effectively. This perception is further reinforced by student feedback and observations recorded in the observation schedule, which noted that projectors were rarely, if ever, used in classrooms to project notes or instructional materials. Such consistency between teacher and student accounts strengthens the credibility of the claim that projectors are largely absent or underutilized in the teaching and learning process.

Interestingly, some head teachers offered a contrasting view, with one stating that they had ensured all classrooms were equipped with both computers and projectors to support teaching. This contradiction could indicate a gap in implementation or monitoring, where projectors may have been provided in theory or in select classrooms, but are not widely accessible or consistently used in practice. The disparity between school leadership perceptions and classroom realities could reveal a challenge in communication, training, and monitoring mechanisms that should ensure that available digital tools are not only provided but effectively integrated into daily teaching practices. Additionally, it calls for further investigation into why the provided tools may not be reaching or benefiting the intended users, possibly due to a lack of training, technical issues, or insufficient support systems.

The results of the study further indicated that most teachers (35.1%) and (18.4%) agreed and strongly agreed respectively that the available computers and other ICT tools in their schools are functioning well. However, a small proportion of teachers (4.4%) disagreed with this view. Interestingly, students seemed to challenge these findings. One student remarked, "We have dilapidated computers that take a long time to boot, and this wastes the teachers' time when they need to use them for teaching." This is a disconnect between teachers' overall perception of ICT functionality and the actual condition of the devices used in classrooms. The students' observations point to underlying issues related to the age, performance, and reliability of the ICT tools, which may not be fully reflected in the teachers' survey responses. A similar concern was echoed by one of the head teachers, who acknowledged the challenges faced in maintaining ICT equipment:

> As a head teacher, I must admit that it has been challenging to keep all the computers in good condition. We have old computers that frequently need repairs, but we are hopeful that we will receive new ones soon, as the government has already been informed of this issue (Head Teacher 4, 15/03/2025).

This statement highlights the broader systemic challenge of maintaining and upgrading ICT infrastructure in schools. While there may be efforts to provide digital tools, their sustainability and usability depend heavily on ongoing support, maintenance, and replacement of outdated equipment. The mixed perceptions between teachers, students, and administrators suggest that more comprehensive assessments and targeted interventions are needed to ensure ICT tools are not only available but also functional and effective in supporting digital learning.

The idea that teachers can easily access available computers when needed for teaching and learning was supported by most of the teachers as 37.7% and 25.4% of the teachers agreed and strongly agreed respectively with the idea. This suggests that, to some extent, digital devices are accessible to teachers, which facilitates the implementation of digital tools in

schools. One of the head teachers affirmed this by stating, “We ensure that teachers can access the computers when they need to use them, and we also encourage sharing, as the available digital devices are not enough for all teachers.”

These findings are further supported by data from the observation checklist, which revealed that most schools do not have an adequate number of digital tools. As a result, teachers are often required to share the limited available computers. This situation reflects both a willingness to use digital tools and a need for increased investment in ICT infrastructure to ensure equitable access for all educators. Moreover, the majority of teachers (39.5%) and (33.3%) agreed and strongly agreed that that ICT tools support and enhance their teaching and learning processes. However, a small percentage (10.5%) were undecided on the matter. Feedback from students also supported this perspective, with many reporting that they learn better when teachers incorporate digital tools into their lessons. One of the head teachers remarked:

> Through my on-going engagement with teachers, it has become evident that providing them with the necessary digital tools greatly enhances their performance. This not only boosts their confidence and efficiency but also creates a more engaging, dynamic, and impactful teaching and learning experience for both educators and students (Head Teacher 6, 13/03/2025).

These insights are in line with findings from a study by Alayan (2022), which investigated the relationship between school heads' technological leadership and teachers’ integration of ICT in instruction in public elementary schools. The study revealed that in schools where head teachers actively promoted the use of ICT, teaching and learning were notably more effective. These findings underscore the importance of not only providing digital tools but also ensuring their accessibility and promoting their meaningful use through supportive leadership and infrastructure investment.

4.5 Head teachers' Coordination of Professional Development and Teachers' Iimplementation of Digital Literacy

The study aimed to examine how head teachers' coordination of professional development influence teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County. Teachers were asked to indicate their opinions on a five-point scale, as shown in Table 4, which included the following options: Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA).

Table 4

Head Teachers' Coordination of Professional Development and Teachers' Implementation of Digital Literacy

Statement	**SD**		**D**		**N**		**A**		**SA**	
	F	%	F	%	F	%	F	%	F	%
The head teacher regularly organizes ICT training workshops for teachers.	9	7.9	22	19.3	13	11.4	52	45.6	18	15.8
I have opportunities to engage in online learning about digital literacy	12	10.5	19	16.7	8	7.0	53	46.5	22	19.3
The head teacher facilitates peer learning sessions on ICT integration.	13	11.4	13	11.4	33	28.9	44	38.6	11	9.6
Professional development opportunities have improved my digital literacy skills.	4	3.5	2	1.8	13	11.4	60	52.6	35	30.7
The frequency of ICT-related professional development enhances my use of ICT in teaching.	4	3.5	23	20.2	19	16.7	53	46.5	15	13.2

Source: ***Field Data (2025)***

Table 4 indicates that a majority of teachers (45.4%) and (15.8%) agreed and strongly agreed that the head teacher regularly organizes ICT training workshops for staff. In contrast, only a small percentage (7.9%) disagreed with this view. In support of this data, one of the head teachers affirmed the findings, noting that teachers are routinely provided with training opportunities aimed at enhancing their skills in the use of ICT for teaching and learning purposes.

Another head teacher shared the following perspective:

> As a head teacher, I am deeply concerned with the professional development of the teachers in my school. As a result, I make it a point to invite a qualified professional to train them, especially at the start of every school term. This initiative has significantly helped many teachers improve their digital literacy skills (Head Teacher 7, 12/03/2025).

These findings suggest that head teachers in Nakuru North Sub-County are taking proactive steps to ensure that teachers are equipped with the necessary ICT skills for effective teaching and learning. The initiative to provide regular training indicates a growing awareness among school leadership about the importance of digital competence in modern education. This aligns with findings by Akram et al. (2022), who emphasized that ongoing teacher training in ICT is essential for preparing educators to meet the demands of 21st-century learners. Their study underscores the critical role of professional development in enhancing teachers' ability to integrate technology into classroom instruction effectively.

A considerable number of teachers (46.5%) agreed that they have opportunities to engage in online learning related to digital literacy. Only a small proportion (7.0%) was undecided about this view. The 7.0% of teachers who were undecided about whether they have opportunities to engage in online learning related to digital literacy may reflect a number of underlying factors. One possible explanation is inconsistent access to reliable internet or digital devices, which could make it difficult for some teachers to fully engage in or even be aware of

available online training opportunities. Additionally, a lack of clear communication from school leadership regarding such opportunities might lead to uncertainty among teachers. Another contributing factor could be varying levels of digital confidence. Teachers who are less comfortable with technology may feel unsure about their ability to participate in online learning, leading them to respond as undecided. Further, time constraints and heavy workloads could cause teachers to be uncertain about whether they can realistically engage in online professional development, even if opportunities exist. This small but significant percentage highlights the importance of not only providing ICT training opportunities but also ensuring that they are clearly communicated, accessible, and tailored to teachers' varying needs and confidence levels. The high number of teachers agreeing on teacher professional development was also supported by head teachers, one of whom stated:

> To ensure teachers have unrestricted access to continuous professional learning, I prioritized providing stable and reliable internet connectivity in our school. This has enabled them to participate in various online training programs, significantly improving their ICT competencies and equipping them to integrate digital tools more effectively into their instructional practices (Head Teacher 9, 12/03/2025).

Similarly, responses to open-ended questions revealed that many teachers reported participating in online workshops designed to enhance their digital skills. These findings highlight the growing role of online platforms in supporting continuous professional development for teachers. However, challenges remain. One of the head teachers pointed out a key barrier:

> As a leader in this school, I encourage teachers to seek opportunities to learn how to use ICT, including attending online workshops on digital tools for teaching and learning. But the challenge has been teachers’ attitudes. Some are not willing to invest their time in going online to search for information or improve their ICT knowledge.

This reluctance has hindered the acquisition of digital skills among some teachers (Head Teacher 10, 15/03/2025).

These findings suggest that while infrastructure and opportunities for online learning exist, the full potential of such initiatives is limited by factors such as teacher motivation and attitude.

The study further revealed that a significant proportion of teachers (38.6%) and (9.6%) agreed and strongly agreed respectively that head teachers facilitate peer learning sessions focused on ICT integration. In contrast, only 11.4% of the teachers strongly disagreed with this statement. These quantitative findings were reinforced by qualitative data from the open-ended responses, where many teachers expressed that they acquire most of their ICT skills through peer learning sessions organized by their head teachers. These sessions appear to serve as valuable platforms for sharing practical knowledge and teaching strategies related to the use of digital tools in the classroom.

One head teacher highlighted the importance of this approach, stating, "Peer-to-peer teaching has been one of my strategies for enhancing ICT skills among teachers. I encourage school-based workshops where teachers are given a chance to teach and learn from one another." This reflects a growing recognition among school leaders that peer learning can be an effective, low-cost method for building digital competencies. By creating spaces for collaborative learning, head teachers are fostering a supportive professional environment that encourages continuous growth and innovation in the use of ICT for teaching and learning.

The study also revealed that slightly more than half of the teachers (52.6%) agreed that professional development opportunities had contributed to the improvement of their digital literacy skills. This quantitative finding was echoed in the open-ended responses, where many teachers emphasized the importance of training in enhancing their ability to use ICT effectively in teaching. Teachers noted that these professional development sessions have equipped them

with both the knowledge and confidence needed to integrate technology into their classroom practices.

This perception was further validated by feedback from students. One student remarked, “Our teachers are effective in the use of ICT in teaching us, and this has improved our learning in class.” Such student testimonials provide additional evidence that professional development has had a positive impact not only on teachers' ICT competence but also on the overall quality of instruction and learning outcomes.

One head teacher emphasized the school’s commitment to continuous professional growth, stating:

> We have made professional development a top priority, recognizing its importance in enhancing our teachers’ skills. By providing a combination of formal training, peer learning, and online resources, we’ve seen a noticeable improvement in their digital literacy. While it’s an ongoing process, the progress is clear, and teachers are becoming more confident in integrating technology into their teaching methods (Head Teacher 4, 18/02/2025).

These findings suggest that targeted professional development initiatives, especially those combining multiple learning approaches, play a critical role in building teachers' digital competencies. As a result, they not only improve teaching practices but also enhance students’ learning experiences in technology-enhanced environments.

The findings further revealed that 46.5% and 13.2% of the teachers agreed and strongly agreed respectively that the frequency of ICT-related professional development significantly enhances their ability to use ICT in teaching. However, 16.7% of the teachers were undecided, possibly indicating inconsistencies in access, quality, or individual engagement with these training opportunities.

The importance of ongoing ICT training was reinforced by one of the head teachers, who affirmed that regular professional development has led to noticeable improvements in teachers' digital proficiency. The head teachers attributed this progress to the structured and consistent training provided under his leadership. In interviews with head teachers, similar sentiments were expressed. One head teacher elaborated:

> Coordinating professional development for digital literacy has been a central focus of our efforts. We have introduced a peer learning program, conducted regular workshops, and provided access to online courses for our teachers. These initiatives have led to a significant improvement in their digital skills, empowering them to better incorporate technology into their teaching practices (Head Teacher 5, 18/02/2025).

These findings indicate the crucial role that frequent and well-coordinated professional development plays in enhancing teachers' ICT integration skills. Regular exposure to training opportunities not only builds digital competence but also fosters confidence and innovation in teaching practices.

The results suggested that teachers generally held positive perceptions of the professional development opportunities coordinated by head teachers. These initiatives were viewed as valuable in enhancing teachers' ability to integrate technology into their instructional practices. One head teacher emphasized the transformative impact of these programs, stating:

> The professional development opportunities have been truly transformative for teachers. They have progressed from feeling intimidated by technology to confidently integrating it into their daily teaching. The workshops and peer learning sessions have played a crucial role in building their skills and confidence, empowering them to effectively utilize technology in the classroom (Head Teacher 19, 16/02/2025).

These findings are consistent with those of Kisirkoi (2015), who found that professional development is essential in enhancing teachers' digital literacy skills in Kenyan schools. The

current study underscores the role of head teachers in effectively coordinating such initiatives, contributing to meaningful changes in teachers' classroom practices.

4.6 Head Teachers' Motivation Strategies and Teachers' Implementation of Digital Literacy Tools

The study also investigated teachers' perspectives on how head teachers' motivation strategies impact teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County. As show on Table 5, teachers were asked to indicate their opinions on a five-point scale, which included the following options: Strongly Disagree (SD), Disagree (D), Neutral (N),

Table 5

Head Teachers' Motivation Strategies and Teachers' Implementation of Digital Literacy Tools (N=114)

Statement	SD		D		N		A		SA	
	F	%	F	%	F	%	F	%	F	%
The head teacher motivates teachers by ensuring that sufficient computers are available for teaching and learning.	6	5.3	12	10.5	12	10.5	67	58.8	17	14.9
Our school's reliable internet connectivity, maintained through the head teacher's support, encourages me to use digital literacy tools.	26	22.8	4	3.5	7	6.1	28	24.6	49	43.0
The head teacher promotes digital literacy implementation by ensuring regular maintenance of ICT tools.	8	7.0	8	7.0	13	11.4	61	53.5	24	21.1
The head teacher's efforts in improving ICT infrastructure positively influence my use of digital literacy tools in teaching.	15	13.2	2	1.8	3	2.6	72	63.2	22	19.3
Through the head teacher's motivational support, I have easy access to ICT tools when I need them for teaching.	50	44.0	23	20.2	19	16.7	12	10.5	10	8.8 %

Source: ***Field Data (2025)***

As shown in Table 5, a majority of the teachers (58.8%) agreed that the head teacher motivates them by ensuring the availability of sufficient computers for teaching and learning. However, a small proportion (5.3%) strongly disagreed with this statement. Interestingly, data from the observation checklist revealed somewhat contradictory findings. In several schools, there was a notable shortage of digital devices, which appeared to hinder the effective implementation of digital literacy tools. This discrepancy suggests a possible gap between perception and actual availability of ICT infrastructure. Furthermore, responses from open-ended questions echoed this concern. Many teachers expressed frustration about the scarcity of digital tools in their schools, emphasizing how the lack of resources negatively impacts their ability to incorporate ICT in teaching. One head teacher reflected on the importance of leadership in this area, stating:

> As a head teacher, I have come to understand that motivating teachers plays a crucial role in ensuring they effectively integrate ICT into their teaching. Providing support, encouragement, and necessary resources empowers them to embrace digital tools, ultimately enhancing teaching and learning outcomes in the classroom (Head Teacher 16, 13/03/2025).

This highlights the vital role school leadership plays in not only motivating teachers but also in ensuring that motivational strategies are matched with tangible support through adequate ICT infrastructure. These findings are in line with the findings of a study by Maponya (2020) who conducted a study on the relationship between ICT adoption in schools and the aspect of transformational leadership in Mongolian elementary schools in Japan and revealed that the component of inspirational motivation plays a particularly crucial role in ICT use in the context of classroom teaching.

The findings indicate that most of the teachers (24.6%) and (43%) agreed and strongly agreed respectively that reliable internet connectivity, maintained through the head teacher's

support, encourages them to use digital literacy tools. This suggests that effective leadership and infrastructural support play a crucial role in promoting the integration of ICT in teaching. However, the presence of a small percentage of teachers (6.1%) who were undecided may point to inconsistencies in internet reliability across different parts of the school, or perhaps a lack of clear communication regarding the head teacher's role in ensuring this support. These mixed responses highlight the need for school leaders to not only provide reliable internet access but also to ensure that all staff are aware of these efforts and feel equally supported in leveraging digital tools. As noted by Yelubay et al. (2022), the efforts of the school leaders is important in supporting ICT integration by teachers in schools.

It was further revealed that while slightly more than half of the teachers (53.5%) agreed that the head teacher promotes digital literacy implementation by ensuring regular maintenance of ICT tools, other sources of data presented a contrasting view. For example, observational checklist data revealed significant maintenance issues regarding the available digital devices in schools. This discrepancy aligns with the statement made by one of the head teachers, who noted, "We try to ensure that all the digital devices are well maintained in this school, but the challenge is where to get money to maintain them properly. This has caused us to be ineffective in maintaining most of them."

Similarly, students who participated in focus group discussions voiced frustration over the condition of the digital devices. One student remarked, "We have been complaining about the dilapidated state of the digital devices we have in this school, but nothing is being done to improve them. This has been a challenge to our learning." These concerns were echoed in the responses to open-ended questions posed to teachers as majority of them indicated that the few computers available in their schools are not functioning as expected and are in need of repair.

Taken together, these findings highlight a gap between perceived leadership efforts and the actual state of ICT infrastructure in schools. While head teachers may be making efforts to

promote digital literacy, financial constraints and lack of timely maintenance appear to hinder the effective implementation and sustainability of ICT tools. A related challenge was highlighted in a study by Njoroge (2017) in Nakuru County, which revealed that financial obstacles are a major hindrance to the implementation of ICT in schools.

The assertion that head teachers' efforts in improving ICT infrastructure positively influence the use of digital literacy tools in teaching was supported by a majority of teachers (63.2%). Only a small proportion (1.8%) disagreed, while 2.6% remained undecided. This suggests that most teachers recognize the role of school leadership in fostering an environment conducive to digital teaching and learning. Most head teachers also expressed a positive view regarding the impact of ICT infrastructure on teaching effectiveness. One head teacher emphasized this by stating:

> As a leader in this school, I have seen teachers' use of ICT improve from the worst to the best. I have made sure that infrastructure is in place to help teachers integrate ICT tools into teaching and learning. I can see it has helped in many ways, although we still have some challenges to sort out, mostly caused by financial constraints (Head Teacher 11, 13/03/2025).

This testimony highlights the proactive role played by school leadership in supporting digital literacy through infrastructure development. However, it also underscores the ongoing challenges posed by limited financial resources, which may hinder further progress. Thus, the findings indicate a strong link between head teacher involvement and the effective integration of ICT tools in education, despite existing constraints. A study by Antia and Dioso (2023) revealed similar findings, highlighting limited resources as a major constraint to effective leadership exercised by school heads in most public schools.

Regarding the statement that head teachers' motivational support enables teachers to easily access ICT tools when needed for teaching, the majority of teachers (44%) and (20.2%)

strongly disagreed and disagreed respectively with the idea. Additionally, 16.7% were undecided and only 8.8% agreed with the statement? These results suggest that most teachers do not feel adequately supported in accessing digital tools for instructional purposes. Data from open-ended questions further confirmed these findings, with several teachers expressing concerns about the limited accessibility of essential digital tools for teaching. Many pointed out that, despite some level of encouragement from leadership, the actual availability and access to functional ICT tools remained a challenge. In contrast, head teachers appeared more optimistic about the motivational support they provided. One head teacher stated, "In my school, I have made sure all teachers have what they need to teach, especially the basic digital tools such as computers and projectors. This has helped them improve their teaching practices." Another head teacher emphasized the importance of ICT in developing students' digital literacy, saying:

> I am aware that when teachers do not embrace the use of ICT in teaching, it limits students' ability to acquire digital literacy skills. So, to avoid such shortfalls, I encourage teachers to use ICT in teaching, and I make every effort to ensure they have what they need to effectively integrate ICT into their classrooms (Head Teacher 16, 13/03/2025).

These contrasting perspectives point to a potential disconnect between head teachers' intentions and teachers' actual experiences on the ground. While school leaders may believe they are providing sufficient motivational and material support, the reported inaccessibility of ICT tools by teachers suggests that these efforts may not be effectively meeting the practical needs in many schools.

4.7 Head teachers' Role Modeling of Digital Literacy and Teachers' Implementation of Digital Literacy Tools

The study also investigated teachers' perspectives on head teachers' role modelling of digital literacy usage. Teachers were asked to indicate their opinions on a five-point scale, as shown in Table 9, which included the following options: Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA).

Table 6

Head teachers' Role Modelling of Digital Literacy and Teachers' Implementation of Digital Literacy Tools **(N=114)**

Statement	SD		D		N		A		SA	
	F	%	F	%	F	%	F	%	F	%
The head teacher, as a role model, has a computer/laptop in their office	8	7.0	19	16.7	4	3.5	31	27.2	52	45.6
The head teacher, as a role model, knows how to operate a computer/laptop	4	3.5	7	6.1	14	12.3	48	42.1	41	36.0
The head teacher, as a role model, knows how to operate a projector	4	3.5	1	0.9	8	7.0	57	50.0	44	38.6
The head teacher, as a role model, uses emails for communication	4	3.5	16	14.0	46	40.4	6	5.3	42	36.8
The head teacher, as a role model, uses PowerPoint for presentations	6	5.3	16	14.0	22	19.3	45	39.5	25	21.9
The head teacher, as a role model, has computerized school records	6	5.3	11	9.6	15	13.2	39	34.2	43	37.7

Source: ***Field Data (2025)***

Based on the findings presented in Table 6, it is evident that the majority of teachers (27.2%) and (45.6%) agreed and strongly agreed respectively with the statement that head teachers, as role models, have computers or laptops in their offices. However, 7.0% of the teachers disagreed with this view. This observation is further supported by interview data, where most head teachers confirmed the presence of digital devices in their offices. One head

teacher remarked, “I find it easy to help my teachers when they encounter difficulties using digital devices, such as when preparing PowerPoint presentations. I use my computer to assist them.” In addition, data from the observational checklist also confirmed that most head teachers were in possession of digital devices, reinforcing the idea that they are modeling the integration of technology in their administrative and instructional roles. A study by Mingaine (2023) argued that technology integration in schools is more effective when heads of schools serve as role models in the process of integrating technology into the day-to-day affairs of the school.

The majority of teachers (42.1%) and (36%) agreed and strongly agreed respectively that head teachers, as role models, are knowledgeable in operating computers or laptops. This finding was further supported by data from the student focus groups, where students confirmed that they had observed their head teachers using computers. Additionally, evidence from the observational checklist revealed that most school heads had computers in their offices, reinforcing the perception of head teachers as competent users of digital technology. As Abdullateef, (2022) noted, when head teachers are competent in the use of ICT, they serve as influential role models, inspiring and encouraging teachers to integrate technology effectively into their teaching practices, thereby enhancing overall ICT adoption in schools.

Most of the teachers (50%) and (38.6%) agreed and strongly agreed respectively that the head teacher, as a role model, knows how to operate a projector. It was only a small number of teachers (0.9%) who disagreed with the idea. This was further confirmed by data from student focus groups, where students reported having seen their head teachers operating computers, an indication that they also possess the skills to use projectors effectively. These observations underscore the role of head teachers as ICT role models within the school environment. This perspective was also echoed in the interviews with head teachers. One head teacher shared:

> As a head teacher, I find it important to be a role model to the entire school community, especially in the use of ICT. As a result, I have made it a priority to undergo training in the use of various digital tools and software. I am now competent in using them, which has given me an advantage when it comes to training others, particularly teachers, to use digital tools effectively (Head Teacher 9, 12/03/2025).

The findings suggest a degree of uncertainty among teachers regarding whether head teachers actively use email for communication, with a significant portion (40.4%) remaining undecided. Only 36.0% of teachers agreed that head teachers use email, which may indicate limited visibility or inconsistent usage of this digital communication tool by school leaders.

This uncertainty presents a challenge for the promotion of digital literacy within schools. As role models, head teachers play a crucial part in setting the tone for the adoption and integration of ICT. If their use of essential digital tools like email is not clearly evident or consistently practiced, it may hinder efforts to foster a culture of digital literacy among staff. For digital literacy to be effectively promoted, it is important that head teachers not only possess digital skills but also demonstrate their application in everyday administrative and professional tasks, such as email communication. This visible engagement with digital tools as contended by Akram, at el. (2022) can serve to encourage and normalize digital practices among teachers and other school stakeholders.

The findings in this study suggest that head teachers are generally perceived by teachers as positive role models in the implementation of Information and Communication Technology (ICT) within their schools. A majority of teachers (39.5%) and (21.9%) agreed and strongly agreed respectively that head teachers use PowerPoint for presentations, indicating that they are actively engaging with ICT tools in their communication and teaching processes, thereby setting an example for staff by integrating technology into daily professional tasks. An even higher percentage of teacher (34.2%) and (37.7%) agreed and strongly agreed respectively that

head teachers maintain computerized school records, highlighting a strong level of ICT adoption in administrative duties. These findings are reinforced by the findings from one of the head teachers who contended:

> As a head teacher, I understand that proficiency with digital tools sets a high standard for teachers. When educators see their head teacher confidently integrating technology into daily work, it motivates and inspires them to adopt similar practices in their own teaching. This positive influence encourages a culture of innovation, ensuring the effective use of technology across the school (Head Teacher 7, 18/02/2025).

However, according to the data from the open-ended questions, it was clear that teachers' perceptions of head teachers' use of more advanced digital tools were somewhat less positive. This result indicated that while head teachers were perceived as competent in basic ICT skills, they might not be as visibly modelling using more advanced digital tools for instructional purposes. Nevertheless, the findings reinforce the perception of head teachers as leaders in technological integration, demonstrating efficiency and organization through their use of digital systems. As noted by one of the head teachers who stated the following in regard to head teachers' role modelling of digital literacy:

> Role modelling is essential in advancing digital literacy. I consistently use digital tools in visible ways, during administrative tasks, staff meetings, and school events, to set a practical example. This approach reinforces the value of digital competence and sends a strong, consistent message about the importance of digital skills within our school (Head Teacher 11, 12/2/2025).

Another head teacher commented:

> I believe in leading by example when it comes to digital literacy. I make a conscious effort to use digital tools in my administrative tasks, during meetings, and in my

interactions with staff and students. It's important to show that digital literacy is a priority at all levels of the school (Head teacher 15, 12/02/2025).

Thus, the findings clearly demonstrate that the visible and practical use of ICT by head teachers positions them as effective role models, likely encouraging teachers to embrace similar practices and fostering a school culture that supports and values the integration of technology in both teaching and administration.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter comprehensively summarises the research findings on head teachers' transformative leadership strategies and their influence on teachers' implementation of digital literacy tools in public primary schools in Nakuru North Sub-County, Kenya. This chapter synthesizes the key findings from the study, draws conclusions based on the data collected as per the research questions, and offers recommendations for practice and further research.

5.2 Summary of the Study Findings

The study aimed to assess how head teachers' leadership strategies impact the teachers' implementation of digital literacy tools. The summary of the study is presented based on the four research questions that guided the study.

5.2.1 Provision of ICT Infrastructure and Teachers' Iimplementation of Digital Literacy Tools

The results show that adequate provision of ICT infrastructure is crucial for effective implementation of technology tools. A majority of teachers reported that the availability of computers and reliable internet connectivity positively influenced their ability to integrate digital literacy tools into their teaching practices. The study findings further revealed that while many schools in Nakuru North Sub-County are making strides in providing ICT tools, significant gaps remain. About less than half of the teachers agreed they had enough computers, though internet access and projector availability were major concerns. Head teachers expressed optimism, stating efforts had been made to equip schools, but student and teacher feedback revealed inconsistencies particularly regarding out dated or insufficient equipment. The findings suggest that while digital tools are valued their effectiveness is hindered by infrastructure issues, limited access, and a possible disconnect between administrative perceptions and classroom realities. Stronger support, maintenance, and leadership are crucial for progress.

5.2.2 Coordination of Professional Development and Teachers' Iimplementations of Digital Literacy Tools

Head teachers who actively coordinated professional development opportunities for teachers significantly enhanced teachers ‘confidence and skills in using digital tools. The data revealed that regular training workshops led to increased teacher engagement with technology. The findings further revealed that head teachers in Nakuru North Sub-County are making efforts to promote ICT integration through structured professional development. A majority of teachers confirmed that regular ICT training workshops are organized, with additional support provided through online learning and peer-led sessions. These initiatives have improved teachers’ digital literacy and teaching practices. Head teachers emphasized a commitment to

on-going training, often inviting professionals or encouraging peer learning. However, challenges such as inconsistent internet access, teacher motivation, and time constraints affect participation. Despite this, the overall perception of professional development is positive, with many noting increased confidence and competence in using technology.

5.2.3 Head Teachers' Motivation Strategies and Teachers' Implementation of Digital Literacy Tools

The study found that motivational strategies employed by head teachers, such as recognition and support, positively affected teachers' willingness to adopt digital literacy tools. Teachers who felt supported were more likely to experiment with new technologies in their classrooms. The study revealed complex relationships between head teachers' strategies and the implementation of digital literacy tools. Whilst all strategies showed significant influences, the strength and direction of these influences varied between student and teacher perspectives, highlighting the multifaceted nature of technology integration in education.

The findings further revealed a mixed picture regarding the role of head teachers in motivating and supporting ICT integration in Nakuru North Sub-County schools. While most teachers agreed that head teachers motivate them by ensuring the availability of digital tools, observation data indicated a shortage of functioning ICT devices, suggesting a disconnect between perception and reality. Teachers also expressed concerns about poor maintenance of digital tools, despite half the number of teachers acknowledging leadership efforts. Financial constraints emerged as a key barrier to effective ICT infrastructure upkeep. While head teachers demonstrate commitment to promoting digital literacy, challenges such as inadequate resources and access gaps hinder effective implementation and impact classroom practice.

5.2.4 Head Teachers' Role Modelling of Digital Literacy usage and Teachers' Implementation of Digital Literacy Tools

The study revealed that Head teachers' role modelling of digital literacy usage emerged as a vital factor influencing teachers' practices. It was further noted that head teachers in Nakuru North Sub-County are widely perceived as positive role models in ICT integration. Most of the study participants agreed that head teachers possess and use digital devices in their offices. There was a strong belief that head teachers could operate projectors, and that they maintain computerized school records. These perceptions were confirmed by observations and student feedback, suggesting strong leadership in digital literacy. Head teachers themselves emphasized the importance of leading by example and supporting teachers through digital competence. Teachers also noted that while head teachers demonstrate basic ICT skills, more advanced usage is less evident. Nonetheless, their consistent use of technology in daily tasks fosters a school culture that values and supports ICT integration.

5.3 Conclusions

The study made the following conclusions based on the research findings:

The first research question sought to establish how the head teachers' provision of ICT infrastructure influence teachers' implementation of digital literacy tools. Thus, it was concluded that adequate provision of ICT infrastructure is crucial for effective implementation of technology tools. It was further concluded that the availability of computers and reliable internet connectivity positively influenced teachers' ability to integrate digital literacy tools into their teaching practices. The study concluded that there is a challenge with the availability of digital devices that is less than half of the teachers agreed they had enough computers, though internet access and projector availability were major concerns. There were challenges regarding out dated and insufficient equipment. The findings suggest that while digital tools

are valued their effectiveness is hindered by infrastructure issues, limited access, and a possible disconnect between administrative perceptions and classroom realities.

Regarding coordination of Professional Development and teachers' implementation of digital literacy tools, the study concluded that head teachers who actively coordinated professional development opportunities for teachers significantly enhanced teachers ‘confidence and skills in using digital tools. Regular training workshops led to increased teacher engagement with technology. It was further concluded that regular ICT training workshops are organized, with additional support provided through online learning and peer-led sessions. However, it was concluded that challenges such as inconsistent internet access, teacher motivation, and time constraints affect participation and implementation of digital literacy tools.

Concerning head teachers' motivation strategies and teachers' implementation of digital literacy tools. It was concluded that motivational strategies employed by head teachers, such as recognition and support, positively affected teachers' willingness to adopt digital literacy tools. Teachers who felt supported were more likely to experiment with new technologies in their classrooms. It was concluded that there is a shortage of functioning ICT devices in schools. Teachers expressed concerns about poor maintenance of digital tools in schools. Financial constraints emerged as a key barrier to effective ICT infrastructure upkeep.

Concerning the last question of the study that sought to find out head teachers’ role modelling of digital literacy usage and teachers' implementation of digital literacy tools. It was concluded that Head teachers' role modelling of digital literacy usage is a vital factor influencing teachers' practices. It was further concluded that head teachers possess and use digital devices in their offices. There was a strong belief that head teachers could operate projectors, and that they maintain computerized school records. It was also concluded that head teachers demonstrate basic ICT skills, but more advanced usage is less evident. Head teachers’

consistent use of technology in daily tasks fosters a school culture that values and supports ICT integration.

5.4 Recommendations

This study, based on the findings, made several recommendations including recommendations for policy, recommendations for practice and the recommendations for further research.

5.4.1 Recommendations for Policy

The study recommends that the policy makers, particularly the government, should prioritize increasing investment in technology infrastructure. This includes providing adequate funding for the purchase and regular maintenance of devices, reliable internet connectivity, and training for both teachers and students. Establishing partnerships with tech companies for affordable solutions and on-going technical support is crucial. Additionally, policies should be developed to ensure that schools are equipped with a long-term digital strategy, including creating specialized roles for IT support staff to ensure sustainable and efficient ICT integration in education.

5.4.2 Recommendations for Practice

The study recommends that the head teachers should prioritize hands-on, continuous training for both staff and themselves. They should establish a culture of learning by actively participating in ICT-related professional development and demonstrating its practical use in daily school activities. Head teachers can encourage peer-to-peer learning and create opportunities for teachers to share successful ICT integration strategies. Additionally, they should allocate time for teachers to explore new technologies and provide consistent support, fostering an environment where digital literacy is embraced and consistently practiced across the school.

5.4.3 Recommendations for Further Research

This study recommends that future studies could be done to explore the long-term impact of head teachers' leadership strategies on student learning outcomes related to digital literacy and investigate additional factors influencing successful technology integration in education. Additionally, future research could explore the reasons behind the discrepancies in student and teacher perceptions of head teachers' strategies, particularly regarding role modelling. Longitudinal studies could also be conducted to examine how the influence of these leadership strategies changes over time as schools progress in their digital transformation journeys.

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APPENDICES

Appendix A: Letter of Introduction

Tangaza University

P. O. Box 15055

Nairobi, Kenya

Dear participant,

RE: **COLLECTION OF SURVEY DATA**

I am Rebecca Wambui Maina, a student at Tangaza University pursuing a master's degree in educational leadership and administration. I am conducting a research about: *Head teachers' transformative leadership strategies and teachers' implementation of digital literacy in public primary schools in Nakuru North Sub-County.* You are requested to participate in the study by answering the questionnaire attached. Kindly respond as honestly as possible and be assured of confidentiality, for this information will be used for this study only.

Thank you in advance for your participation.

Yours Sincerely,

Rebecca Wambui Maina

Appendix B: Informed Consent Form for Participants

I am Sr Rebecca Maina writing to invite you to participate in a research study titled *Head Teachers Transformative Leadership Strategies on Teacher's Digital Literacy Implementation in public primary schools in Nakuru North Sub-County.*

Conducted by Sr Rebecca Maina at …….. Before deciding to participate, it is important for you to understand the purpose, procedures, risks, and benefits of the study.

Purpose of the Study

The study will assess the head teachers' transformative leadership strategies on teachers' implementation of digital literacy in public primary schools in Nakuru North Sub-County, Kenya.

Risks and Benefits

Potential risks include failure to obtain the required information to direct the findings and the study will directly be of great assistance to the Ministry of Education by guiding the policy-making procedures.

Confidentiality

All information collected will be kept confidential, and your identity will be protected. Data will be anonymized and stored securely. Your responses to this survey will be anonymous. Please do not write any identifying information on your survey. Participant data will be kept confidential except in cases where the researcher is legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse and suicide risk.

Contact Information

Suppose you have questions at any time about this study or you experience adverse effects as a result of participating in this study. In that case, you may contact the researcher whose contact information is provided on the first page.

Voluntary Participation

Your participation in this study is voluntary. It is up to you to decide whether to participate in this study. If you choose to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are free to withdraw at any time without giving a reason. Withdrawing from this study will not affect your relationship with the researcher, if any. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed. Your participation is voluntary, and you can withdraw at any time without consequences. Your decision will not affect your current or future relationship in any way.

Consent

I have read and understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason and without cost. I know that I will be given a copy of this consent form. I voluntarily agree to take part in this study."

Participant's signature _____ Date _____

Researcher's signature _____ Date _____

Appendix C: Questionnaire for Teachers

You are requested to take a few minutes and respond to this questionnaire as honestly as possible. There are five sections: A, B, C, D, and E. Respond to questions in all the sections by putting a tick (✓) in the appropriate space. ***Remember, no answer is necessarily correct or wrong***. Therefore, feel free to give answers you consider relevant. You need not write your name.

SECTION A: Demographic Information

1. Gender: Male [ ] Female [ ]

2. What is your age? Below 30 years [ ] 30-39 [ ] 40-49 [ ] 50 and above [ ]

3. What is your highest professional qualification? Certificate [ ] Diploma [ ] Bachelor's Degree [ ] Master's Degree [ ] Doctorate [ ]

SECTION B: Head Teachers' Provision of ICT Infrastructure and Teachers' Implementation of Digital Literacy

4. To what extent do you agree with the following statements about the head teachers' provision of ICT infrastructure on teachers' implementation of digital literacy? Kindly tick **(✓) your** correct choice. Key: 1= Strongly Disagree; 2= disagree; 3= Undecided; 4= Agree; 5= Strongly Agree.

Number	Statement	1	2	3	4	5
1	There are enough computers/laptops for us to use in our school.					
2	We have a good internet connection in our school for learning.					
3	Our school has projectors that teachers use for teaching.					
4	The computers and other ICT tools in our schoolwork well.					
5	We can easily access computers when we need them for learning.					

6	The ICT tools in our school help us learn better.					

5. Briefly state some other ICT infrastructure that the head teacher has provided

.....

.....

SECTION C: Head Teachers' Coordination of Professional Development and Implementation of Digital Literacy

6. To what extent do you agree with the following statements about the head teachers' coordination of professional development and teachers' implementation of digital literacy? Kindly tick (✓) **your** correct choice. Key: 1= Strongly Disagree; 2= disagree; 3= Undecided; 4= Agree; 5= Strongly Agree.

Number	Statement	1	2	3	4	5
1	The head teacher regularly organizes ICT training workshops for teachers.					
2	I have opportunities to engage in online learning about digital literacy					
3	The head teacher facilitates peer learning sessions on ICT integration.					
4	Professional development opportunities have improved my digital literacy skills.					
5	The frequency of ICT-related professional development affects my implementation of digital literacy.					
6	The content of professional development sessions is relevant to my needs in implementing digital literacy.					

7. Briefly state some ways that your head teacher facilitates professional development in your school

.....

.....

SECTION D: Head Teachers' Motivation and Implementation of Digital Literacy

8. To what extent do you agree with the following statements about the head teachers' motivation for teachers' implementation of digital literacy? Kindly tick (✓) **your** correct choice. Key: 1= Strongly Disagree; 2= disagree; 3= Undecided; 4= Agree; 5= strongly agree.

Number	Statement.	1	2	3	4	5
1	The head teacher motivates teachers by ensuring that sufficient computers/laptops are available for teaching and learning.					
2	Our school's reliable internet connectivity, maintained through the head teacher's support, encourages me to use digital literacy tools.					
3	The head teacher promotes digital literacy implementation by ensuring regular maintenance of ICT tools.					
4	The head teacher's efforts in improving ICT infrastructure positively influence my use of digital literacy tools in teaching.					
5	Through the head teacher's motivational support, I have easy access to ICT tools when I need them for teaching.					
6	The head teacher's commitment to providing quality ICT infrastructure motivates me to integrate digital literacy in my lessons.					

9. Briefly state some other ways that your head teacher's motivation influences teachers' integration of ICT in your school.

.....

.....

SECTION E: Head Teachers' ICT Role modelling and Teachers' Implementation of Digital Literacy

10. To what extent do you agree with the following statements about the head teachers' ICT role modelling on teachers' implementation of digital literacy? Kindly tick **(✓) your** correct choice. Key: 1= Strongly Disagree; 2= disagree; 3= Undecided; 4= Agree; 5= strongly agree

Number	Statement	1	2	3	4	5
1	The head teacher, as a role model, has a computer /laptop in their office					
2	The head teacher, as a role model, knows how to operate a computer/laptop					
3	The head teacher, as a role model, knows how to operate a projector					
4	The head teacher, as a role model, uses emails for communication					
5	The head teacher, as a role model, uses power points for presentations					
6	The head teacher, as a role model, has computerized School records					

11. Briefly state some ways that your head teacher is a role model in your school.

.....

.....

Appendix D: In-depth Interview Guide for Head Teachers

Section A: Demographic Information

1. What are your academic qualifications?

2. How long have you served as a **head** teacher?

SECTION B: Head teachers' provision of ICT infrastructure and Teachers' implementation of Digital Literacy

3. What specific strategies do you use to ensure adequate ICT infrastructure in your school?

……
……

4. How do you prioritize the allocation of resources for ICT infrastructure?

……
……

5. What challenges do you face in providing and maintaining ICT infrastructure, and how do you address them?

……
……

Section C: Head teachers' coordination of professional development and Teachers' implementation of digital literacy

6. How do you coordinate and facilitate professional development opportunities for your teachers in the area of digital literacy?

……
……

7. What types of professional development activities or programs do you provide to enhance teachers' digital literacy skills? (Probes: Training workshops, online learning resources, peer learning collaborations)

……
……

8. In your experience, how does the coordination of professional development influence teachers' ability and willingness to implement digital literacy in their classrooms?

……

……

SECTION D: Head teachers' Motivation and Teachers' implementation of digital literacy

9. How do you motivate teachers to implement digital literacy in your school?

……

……

10. What are your preferred motivation strategies to influence the implementation of digital literacy in your school? (Probes: Communicating vision, recognition, commendation)

Section E: Head teachers' ICT role modelling and Teachers' implementation of digital literacy

11. What ICT knowledge and skills do you possess? (Probes: Basic computer skills, internet and email usage, administrative software)

……

……

12. How do you apply and demonstrate your ICT knowledge and skills in your role as a head teacher?

……

……

Appendix E: Focus Group Discussion Guide for Students

1. Have you noticed any changes in how your teachers use digital tools (like computers, tablets, projectors) in class? What do you think made those changes possible?

2. Can you describe the availability and condition of ICT tools (computers, internet, etc?) In your school? How do you think that affects how teachers teach using digital tools?

3. Have you ever heard your teachers talk about attending workshops or training on using digital tools in teaching? If yes, did you notice any difference in how they teach afterward?
4. Do you think your teachers are confident using digital tools in class? What makes you think so?
5. Do you feel your teachers are excited or interested when they use digital tools in teaching? What do you think motivates them to use those tools (or not use them)?
6. Can you give an example of a time when a teacher seemed encouraged or supported by the school leadership to use digital tools in class? What was the outcome?
7. Have you seen your head teacher or other school leaders using digital tools (like during assemblies, announcements, or meetings)? How do you think that influences your teachers?
8. Do you think your head teacher sets a good example when it comes to using digital technology? How does that affect how your teachers use digital tools in the classroom?

Appendix F: Observation Check list

Date: _____
Time: _____

1. ICT tools used during the lesson (Check all that apply):
   □ Desktop computer
   □ Laptop
   □ Tablet
   □ Projector
   □ Smartboard
   □ Digital camera
   □ Educational software
   □ Internet resources
   □ Other (specify): _____

2. Teacher's proficiency in using digital tools:
   □ (Very low)
   □ (Low)
   □ (Moderate)
   □ (High)
   □ (Very high)
3. Student engagement with digital resources:
   □ (Very low)
   □ (Low)
   □ (Moderate)
   □ (High)
   □ (Very high)
4. Integration of digital literacy into lesson content (Check all that apply):
   □ Used for presentation only
   □ Students actively using digital tools
   □ Digital resources used to enhance content understanding
   □ Digital skills explicitly taught as part of the lesson
   □ other (describe): _____
5. Challenges observed during ICT use (Check all that apply):
   □ Technical issues
   □ Lack of student familiarity with tools
   □ Time management
   □ Classroom management difficulties
   □ Inadequate infrastructure
   □ Other (specify): _____
6. Evidence of recent professional development application (Check all that apply):
   □ New teaching technique using ICT
   □ Improved troubleshooting skills
   □ Enhanced digital content creation
   □ Increased variety of digital tools used
   □ Other (specify): _____
7. Motivational strategies observed (Check all that apply):
   □ Verbal encouragement for ICT use
   □ Recognition of students' digital skills
   □ Rewards for innovative use of technology
   □ Peer teaching opportunities
   □ Other (specify): _____
8. Instances of teachers referencing head teacher's digital practices (Check all that apply):
   □ Mentioned head teacher's ICT initiatives
   □ Used tools recommended by head teacher
   □ Applied strategies modelled by head teacher
   □ Referenced head teacher's ICT vision
   □ Other (specify): _____

Thank you!

Appendix G: Reliability Statistics

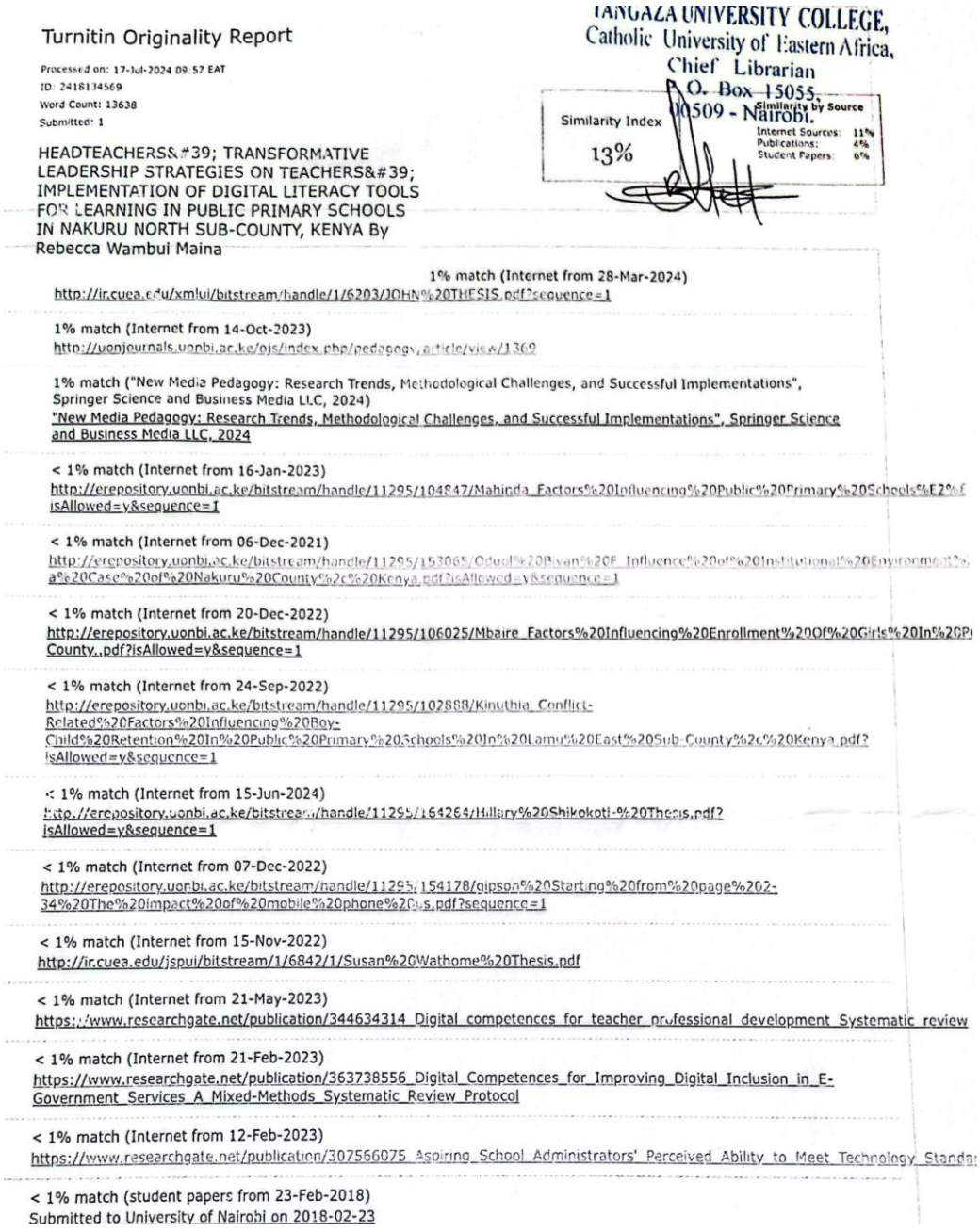
Cronbach's Alpha	N of Items
.787	10

Item-Total Statistics

Statements	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The head teacher, has a computer /laptop in their office	56.6050	127.851	.161	.837
The head teacher, as a role model, knows how to operate a computer/laptop	53.6738	134.760	.299	.812
The head teacher, as a role model, knows how to operate a projector	55.9025	135.640	.224	.876
The head teacher, as a role model, uses emails for communication	55.8365	126.212	.493	.882
The head teacher uses power points for presentations	53.8208	139.845	.031	.829
The head teacher, as a role model, has computerized School records	56.1069	131.925	.533	.814
I have a good understanding of how to use instructional technology in my teaching	54.6006	136.695	.278	.822
I regularly integrate digital tools into my teaching practices	55.9560	131.222	.553	.813

I actively work on developing my students' digital skills during lessons	54.1730	117.891	.597	.807
I create digital learning materials for my students	54.5440	140.179	.108	.824

Appendix H: Plagiarism Report



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Appendix I: letter of Introduction

TANGAZA UNIVERSITY

Teaching Minds / Touching Hearts / Transforming Lives

REF: TU/ISERC2024/01/0027

13th August 2024

To: REBECCA WAMBUI MAINA

Reg. No. CMLA 1701

Dear Rebecca,

Re: "HEADTEACHERS' TRANSFORMATIVE LEADERSHIP STRATEGIES ON TEACHERS' IMPLEMENTATION OF DIGITAL LITERACY TOOLS FOR LEARNING IN PUBLIC PRIMARY SCHOOLS IN NAKURU NORTH SUB-COUNTY, KENYA".

This is to inform you that TU-ISERC has reviewed and approved your above research proposal. Your application approval number is *TU/ISERC2024/01/0027*. The approval period is **13th August 2024 – 14th August 2025**. This approval is subject to compliance with the following requirements;

1. Only approved documents including (informed consents, study instruments, MTA) will be used
2. All changes including (amendments, deviations, and violations) are submitted for review and approval by TU-ISERC.
3. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to TU-ISERC within 72 hours of notification.
4. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to TU-ISERC within 72 hours
5. Clearance for export of biological specimens must be obtained from relevant institutions.
6. 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.
7. Submission of an executive summary report within 90 days upon completion of the study to TU-ISERC.

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. Daniel M. Kitonga (Ph.D., MBA)
Chair, TU - ISERC

TANGAZA UNIVERSITY INSTITUTIONAL SCIENTIFIC AND ETHICAL REVIEW COMMITTEE (TU-ISERC)
★ 13 AUG 2024 ★
P. O. Box 15055 - 00509
NAIROBI - KENYA

APPENDIX J: Research Permit (NACOSTI)

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **108747**

Date of Issue: **21/August/2024**

RESEARCH LICENSE

This is to Certify that Sr.. REBECCA WAMBUI MAINA of Tangaza University College, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nakuru on the topic: HEADTEACHERS' TRANSFORMATIVE LEADERSHIP STRATEGIES ON TEACHERS' IMPLEMENTATION OF DIGITAL LITERACY TOOLS FOR LEARNING IN PUBLIC PRIMARY SCHOOLS IN NAKURU NORTH SUB-COUNTY, KENYA for the period ending : 21/August/2025.

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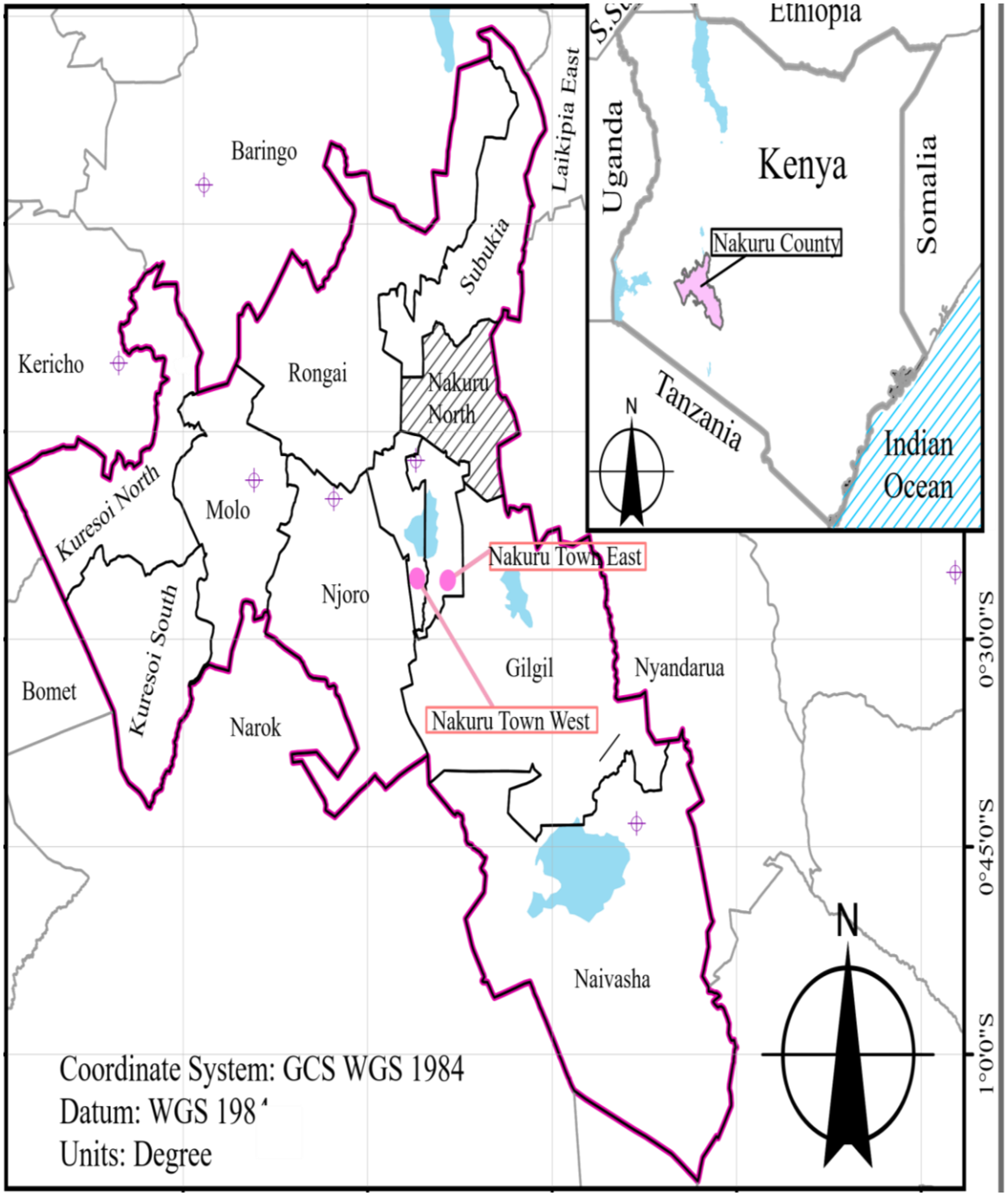
APPENDIX K: Study Area Map



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