INFLUENCE OF ORGANIZATIONAL DIGITAL READINESS ON DIGITALIZATION OF SECONDARY SCHOOLS IN KIPIPIRI SUB COUNTY, NYANDARUA COUNTY, KENYA.

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A Research Project Report Submitted in Partial Fulfillment of the Requirements for the Award of Master of Education in Educational Administration of University of Nairobi.

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DECLARATION

This research endeavor is completely original with no submissions to other universities for the award of degrees.

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DEDICATION

This is to my family members, my loving and caring grandfather Mwasame and my mother

Beatrice for their encouragement continuous moral and spiritual support and understanding to

pursue Masters and their prayers.

ACKNOWLEDGEMENT

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

AI: Artificial Intelligence

COVID 19:   Coronavirus Disease 2019

EU: European Union

Education 4.0:   Education in Fourth Industrial Revolution

ICT: Information Communication Technology

IoT: Internet of Things

KCSE: Kenya Certificate of Secondary Education

MoE: Ministry of Education

U o N: University of Nairobi

ABSTRACT

School digitalization is the integration of technology and digital tools into education, enhancing teaching, learning, administrative tasks, and communication. This study assessed the impact of organizational digital readiness on the digitalization of secondary schools in Kipipiri sub-county, Nyandarua County, Kenya. The objectives were to establish the influence of Boards of management governance, to assess how ICT security, to determine how competency level of Principals and to examine how technological maturity influences the digitalization of secondary schools in Kipipiri Sub County. The research employed a descriptive research approach and focused on school principals, department heads, and fourth-year students. Schools were chosen using stratified sampling, and data was gathered through surveys and interviews. Both descriptive and inferential analyses were carried out to explore connections between different factors. The findings demonstrated that all the factors being studied had a noteworthy impact on school digitalization. Among these, readiness in terms of skills showed the strongest correlation, which was 0.744. The study recommended that school administrations provide regular professional development opportunities to enhance teachers' ICT skills and pedagogical knowledge. Ongoing professional development should be implemented to keep pace with evolving technology. Furthermore, administrations should actively integrate technology into teaching and learning processes and encourage teachers to explore innovative instructional strategies using ICT tools and resources.

CHAPTER ONE

INTRODUCTION

1.0 Background to the Study

Education systems world over are undergoing dramatic changes as a result of technology. This has resulted in changes in education policies to address these changes. This has brought new ways of learning and acquisition of new competencies in order to prepare them to live in an era where there is a lot of information left, right and Centre and how to use this information for them to become creators of knowledge but not consumers. (Buabeng-Andoh, 2019). Digital pedagogies ensure authentic learning as students will be actively cooperating, working and interacting hence socially constructing knowledge. (Maussumbayev et al., 2022). The COVID 19 pandemic has taught us the importance of learning community and school leaders to possess digital skills which utilizes innovation based on ICT. This will enable institutions to achieve optimal performance (Antonopoulos et al., 2021)

The legal framework concerning the integration of ICT in education encompasses various aspects. This involves the government's dedication to implementing Education for All (EFA) objectives through the Ministry of Education. The Qingdao Declaration on ICT and post-2015 Education is an advocacy for fair and high-quality education along with lifelong learning. The Constitution of Kenya 2010, in Articles 43(f) and 53(I)(b), guarantees that all children have equal access to education. The Basic Education Act of 2013 ensures that each child has the right to receive free and compulsory education.

Guiding policies related to Information Communication and Technology incorporate the National Information, Communications, and Technology (ICT) policy from 2019, as well as the National Education Sector Strategic Plan for 2018-2022. The achievement of these strategic goals will contribute to the realization of Kenya's long-term development plan, Vision 2030, and the Medium-Term Plan spanning 2018-2022 (MoE, 2022).

There are several hurdles to access and usage of ICT in Kenya, including extreme poverty that impede utilization of ICT facilities, inadequate rural electrification, and recurring power outages. Where there is energy, expensive Internet provision fees, expenditures connected to ICT equipment, inadequate facilities and support all impede ICT application (Kipsoi et al., 2012). To achieve effective outcomes, digitalization necessitates skilled managers who, with their expertise and experience, can drive the transition to combine business and information technology enterprises toward innovation and company transformation. The strategy-making process and organizational culture of businesses that are digital leaders have undergone major changes as they work to acquire new digital capabilities. Organizational change from top to bottom is necessary for digital organizations. In order to gain value from digitization and build new channels for communication and cooperation, businesses must be competitive, innovative, and open to new challenges (Karipur, Balaramachandran, 2022). The usage of ICT infrastructure in learning environments facilitates a variety of knowledge production strategies, and the more students integrate ICT into their learning activities, the more noticeable the influence of this technology becomes. Teachers strategically use ICT to improve learning by creating relevant and engaging learning experiences for their students. Students have a positive attitude towards learning. They

engage in self-driven exploration, utilizing ICT in a creative and suitable manner, which fosters an environment where they regularly analyze their work methods by contemplating the difficulties they encounter in their careers (Bariu, 2020). It can be challenging for teachers to develop reflective skills since they must constantly focus on their students' learning, methods of instruction, and methods of student evaluation. When prospective teacher education program administrators engage as reflective practitioners to concentrate on academic performance, teachers' reflective practices are successful. The effectiveness of the educational process and goals depends on leadership (Agustina et al., 2020)

Learning, training, and teaching professionals have chances for ICT research and innovation in a supportive learning environment. The chance to revolutionize learning and instruction in our institutions of learning and better prepare students, trainees, and instructors for a knowledge-based economy is provided by advancements and research in ICTs. Since technology is always changing, instructors and students must constantly look for new ways to apply ICT in education and training. to create technology that is functional and meets the requirements of all students. Strong capacity-building is required at both pre-service and in-service stages of training. Therefore, to effectively use ICT in education and training, it is essential that key players such as educators, administrators in academic institutions, technologists, and policy makers possess the requisite expertise, abilities, and mindsets (Education, 2021).

More research is being done on technology in an effort to close disparities in formal education in the Global South. Researchers have looked into how students utilize apps on tablets and e-readers in the classroom. Digital technologies are utilized to keep up access to educational resources and

contact with teachers and colleagues, strengthening interpersonal bonds. Shupavu 291 is an SMS-based mobile learning platform used by Kenyan kids to maintain continuity of learning. It is available to families with low-end phones. Infrastructure is important, but Principals should also think about cost and easily available technology (Chen., Jasińska, 2021).

1.2 Statement of the Problem

Recently, digitalization has become increasingly important in education. Educators around the world and in Kenya are trying to adapt their education system to changes that characterizes current societies. Digitalization offers unparalleled efficiency gains and ways to better enhance learning outcomes but Organizational digital readiness is a costly affair at the initial stages and takes a long time to yield results. Research has been done on the influence of ICT in relation to subjects taught in secondary schools. However, these mitigations have yet to have any significant effect on digitalization. There have been little work exploring determinants of principals as a technology and integration leader since Principal are in charge of corporate strategy(Chepkonga, 2015). This means ICT integration has not significantly been embraced. Failure of schools to adopt organizational digital readiness in the 21st century can result to lower work efficiency, poor communication within different levels of the organization, lower funding of organizations, motivation of employees, deny teachers opportunities for ongoing professional development, team building through collaboration and may result to resistance to change. The quality of infrastructure is limited resulting in unequal access to computers. Moreover ,teachers and students often lack digital skills to effectively use the available technology effectively .This is further supported by a 2018 report by Teachers service commission revealed that 80% of teachers had knowledge gaps on IT(Consultant and Atambo, n.d.).Digitalization also come with the potential risks with regards

4

to security, improper use of technology and inequality. If this is left unchecked it will deny learners, the end users, learner centered approach opportunities which develops their problem solving skills(Centre, n.d.).Organizations lag behind in use of digital technologies missing out on benefits of digital technologies in education administration. Addressing this problem will have practical benefits for schools.it will result in development of digital strategy plan which enables schools identify digital drivers, barriers and examining critical capabilities which leads to digital maturity.

1.3 Purpose of the Study

The aim of this research was to determine how the digitalization of secondary schools in Kipipiri sub-county, Nyandarua county, Kenya, is affected by the level of organizational digital maturity.

1.4 Objectives of the Study

This study had the following objectives

i.   To ascertain the impact of governance by Boards of Management on the process of digitalizing secondary schools in Kipipiri.

ii. To evaluate the extent to which ICT security measures of the school impact the digital transformation of secondary schools in Kipipiri.

iii. To determine how competency level of Principals influence digitalization of schools in Kipipiri.

iv. To examine how technological maturity influences the digitalization of secondary schools in Kipipiri.

1.5 Research Questions

The researcher was guided by the following questions during the study

i. What is the influence of Board of Managements on digitalization of secondary schools in Kipipiri Sub County?

ii. To what extent does the ICT security readiness of schools influence the digitalization of secondary schools in Kipipiri Sub County?

iii. How do the schools' Competency level readiness of principals' influence digitalization of secondary schools in Kipipiri Sub County?

iv. To what extent does technological readiness influence digitalization of secondary schools in Kipipiri sub county?

1.6 Significance of the Study.

There is limited research conducted in the area of digital readiness and digitalization especially in education institutions here in the country. This research will hold significance for educational stakeholders in Kipipiri, Nyandarua, and the Ministry of Education as it will pinpoint gaps and recommend appropriate actions to rectify these gaps, aiding in the development of informed policies.

The research findings will offer valuable insights to teachers, highlighting the importance of adapting their teaching methods to fully harness the potential of ICT.

The findings would reveal gaps in program implementation that require attention. This information would serve as a motivation for curriculum developers to enhance teacher preparation programs

by providing comprehensive training on ICT and instructional material development, both during pre-service and in-service stages.

The findings of this study may be used by other researchers who will conduct studies on digital technologies as they may require reference to the data used in the study

1.7 Limitations of the study

Due to the fact that the majority of schools in the Kipipiri Sub County were located in rural regions, internet access was a challenge. Therefore, even if there is adequate internet access in metropolitan regions, the study's conclusions might not be applicable to schools there. Schools come in a variety of shapes and sizes, and as a result, they are given varying amounts of ICT resources. Most people under- or overrate themselves when it comes to their comprehension of digital leadership, according to self-reports.

1.8 Delimitations of the study

The goal of this study was to determine the degree to which principals were prepared to develop a system of continuous improvement for digital learning. The study was restricted to four goals: how technical readiness, the security of the school's ICT infrastructure and the competency level preparedness of principals. The investigation was carried out at 16 secondary schools. The study's participants were form four students and school principals because they had personal knowledge of the impact of ICT on enhancing learning outcomes under the direction of principle digital leadership. The factors under consideration were school ICT security preparedness, board of management preparation for digitalization, principle competency level readiness, and technological readiness.

1.9 Basic Assumptions

The following were the assumptions. That all the schools that were involved in the study had the requisite digital technologies. That the respondents were free, knowledgeable to provide truthful information in order for the findings of the study.

1.10 Definition of Significant Terms

Digital Literacy is the ability to understand and utilize information provided by computers in diverse formats and from various origins.

Digital Sustainability refers to the idea of employing digital technologies and resources in a manner that guarantees lasting viability, adaptability, and a beneficial influence on both the natural world and society.

Digitalization/Digital transformation refers to the organizational shift that the extensive distribution of digital technology causes and shapes.

Governance refers to the management, direction, and control system and procedures used in educational institutions.

ICT refers to technology that allow for the transmission of information.

Leadership refers to the adoption and use of leadership strategies appropriate for the digital age, including dependence on contemporary technological platforms.

Organization digital readiness is the state of organization being prepared for Digitalization.

1.11 Organization of the Study

There are several chapters in this research. The purpose of Chapter One is to provide context for the study's topic. The history of the study's variables was reviewed. The description of the issue, the aim of the study, the importance of the investigation, the restrictions and delimitations of the study, the study's assumptions, the definitions of key terminologies, and the study's structure.

The literature on digitalization, governance and leadership preparedness, ICT security, and competence readiness was examined in Chapter 2's introduction. This chapter also summarizes the theories that guided the study.

Introduction, the study's methodology, the respondents, sample size and sampling technique, questionnaire return rate, research instruments, data collection processes, data analysis techniques, ethical considerations, and the operationalization of the variables are all included in Chapter 3. Data analysis in accordance with the objectives is covered in Chapter 4, followed by a summary of the results. The summary of the impact of governance, ICT security, competence, and technical preparedness on digitalization is presented in Chapter 5. Conclusions, suggestions, study additions to the body of knowledge, and areas requiring more research.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter deals with Digitalization, Governance and leadership readiness, ICT security readiness, technological readiness, Competency level, summary of related literature review, theoretical framework and conceptual Framework.

2.1 Digitalization

Before deploying ICT resources, the rollout of digital technologies in schools must be planned and must guarantee that the schools have complied with the very minimum preparedness requirements. A thorough strategy for human resource preparedness, including infrastructure, support, and training, ensures that teachers are up to date with technology. The purpose of monitoring tools for principals should not be data collection but rather process improvement. This feedback method reveals the causes of success and potential areas for development. The transition to digitalization will need a large investment, not just in hardware but also in capacity building and ongoing costs associated with ICT use. Digitalization is the most cost-effective way to raise the quality of public education, ensure equitable access to excellent education, and improve retention and student accomplishment, therefore achieving SDG number 4 (Alghamdi., Holland, 2020).

2.2 Governance and leadership readiness

Digital transformation of organizations requires leaders who can leverage on digital technologies to innovate and drive changes in all contexts, are leaders progressing from doing digital to being digital. Digitalization is coming to all of us. Sooner or later due to the current digital explosion caused by market disruption, which has disrupted the current paradigm (*What You Need for*

Surviving Digital Transformation Is Not Digitally Savvy Leaders, n.d.). As a preventative move against the COVID-19's potential spread and the potential impact it would have on the lives of roughly 17 million students nationwide on March 15, 2020, the government then immediately announced the shutdown of schools. For a target audience of 15 million students, the Ministry of Education (MoE) announced in May 2020 that public school lessons will be broadcast through several platforms, including radio, television, YouTube, and Kenya Education Cloud, in accordance with the academic calendar. This Basic Education COVID-19 Emergency Response Plan, however, was marred and faced numerous obstacles, such as lack of accessibility, inadequacy, low literacy in information and communication technologies among pupils, parents, and educators, as well as additional social, medical, fiscal, and psychological consequences caused by a global epidemic and closure of schools (Woomer et al., 2021).

According to Veenhoff et. al. factors that are strongly associated with ICT usage include gender, age, level of literacy proficiency and educational attainment which will predict computer usage by the respondent. Gender has to be considered before introducing a new technology to the organization. To circumvent societal biases and gender disparities, numerous studies have indicated that males exhibit a more favorable outlook toward utilizing computers compared to females. This increased interest often translates into better performance in computer literacy among males as opposed to females. ICT has the potential to contribute to the transformation of the educational organization and improves the quality of the learning. According to Okewa (2011). There is uneven diffusion of ICT between the urban and rural areas, access to these technologies are constrained by literacy and finances. Principals can utilize ICT in their schools to create digital libraries that will act as information centers for teachers and students to get updated and rich

11

information on different subjects, they can obtain multimedia kits, newspapers, models, maps and slides. A lot of information can be stored online. This will change the management of school libraries resources (Chepkonga, 2015).

Now that technology has made teaching simpler, instructors may help their pupils learn by using printed images and aural cues. Additionally, computer systems and the advancement of technology are also to be thanked. The way we learn has evolved since the advent of technology, and we no longer primarily rely on spoken and written language for instruction. The term "multimedia" pertains to the generation and utilization of a range of media and communication technologies to enrich the visualization of content and promote collaborative efforts. Different aspects of multimedia aid in the teaching and learning processes. Pictures, movies, audios, information transmission technologies, and everything relating to computer networks are all included in the multimedia components. ICT in education enhance learning abilities and revolutionize all aspects of learning and instruction. It establishes principles and boosts interaction between students and teachers. Additionally, it raises student performance levels. In recent years, integrating technology into instruction has become crucial and a significant component of education (Al-Ajmi, 2020). To facilitate discussion and bring the team together around a single goal, management is required. Fighting back against opposition is a special managerial difficulty. For a digital firm, management must foster a proactive, agile, and inventive work environment. Finding a balance between addressing the benefits of digitization and the drawbacks and threats of the online world is another problem. It is the responsibility of managers and leaders to see to it that the digital transformation plan is put into practice (Cabero-Almenara et al., 2021). According to the ISTE Standards, primary technology leadership techniques included five dimensions. A digital era learning culture is

characterized by instructors having confidence in their school principal's ability to cultivate and sustain a vibrant educational environment that leverages modern digital approaches, providing all students with an engaging, relevant, and stimulating learning experience. If educators trust their principal's capacity to nurture an environment of continuous professional growth and creativity, enabling them to enhance student learning by seamlessly incorporating advanced technology and digital tools, it is deemed a pinnacle of achievement within their profession. In order to achieve systemic improvement (Leong Mei Wei et al., 2016), asserts that the process of digitizing schools should comprise systematic transformational models that incorporate key components including the institution's mission, student professional development, instructional strategies, and appropriate digital assets.

2.3 Technology readiness and digitalization

Learning is significantly influenced by motivation. Technology-enhanced learning activities can encourage students to read more frequently. Individuals can learn independently thanks to multimedia-assisted instruction. Learners are given access to a range of media, including graphs, videos, and photos, which can assist them in breaking down difficult or abstract ideas into more understandable explanations and generalizations. Students appear to benefit from multimedia technologies by gaining background information on a particular subject. With the use of MAI, teachers may offer a variety of materials pertaining to their lessons that can aid students in learning (X. Liu et al., 2020).

The practice of technological literacy in schools has three facets: a classroom-based component, a school-based cultural component, and a community-based component. Digital literacy practiced

by students and other school personnel during class time, including throughout the learning process, is referred to as class-based digital literacy. Digital literacy practiced inside a school setting is known as school culture-based digital literacy (Sinaga et al., 2021). This practice takes the shape of a number of activities and school services that assist school operations. Massive Open Online Courses (MOOCs), which are housed on the LMS, are free Web-based distance learning courses, while some MOOCs are instances of fee-based platforms. They provide top-notch instructional material in a variety of subject areas examples are edX(http://www.edx.org/),Coursera(https://www.coursera.org/), Udacity (http://www.udacity.com/),A cloud-based learning management system and free online service, Google Classroom is a component of Google Apps for Education. By allowing teachers and students who have signed up to use Google Classroom to share files via computers, tablets, and cellphones, engagement is made easier.Google Classroom combines many Google tools. Google Drive is connected for assignments. Students can post questions about learning areas and obtain responses from instructors by posting their questions in online classrooms that teachers have created for them to share learning materials for students to download and view. Additionally, teachers can publish supplementary materials for students to peruse at any time as well as electronic versions of assignments that can be scored and used to track students' progress. Seesaw is a learning platform that gives users the chance to safely keep their projects, notes, drawings, videos, images, links, and films in the cloud where parents can see them. On the game-based learning platform Kahoot, students may take multiple-choice tests and play games to learn. The IT department has to be up to date on the latest technology innovations, like Edmodo, Microsoft Teams, and Edraak K-12 (Yehya, 2021).

Numerous studies have looked at the difficulties of integrating Information Community Technology (ICT) in schools. According to studies, few teachers have successfully incorporated ICTs into the classroom. It's a common misperception that giving students access to this technology will automatically address concerns with educational access and fundamentally alter the area of education. Lack of time, ambiguity about the e-Education policy, poor infrastructure and policy support, a lack of necessary skills, and other issues all contribute to the ineffective use of ICTs in the educational context. But one of the biggest problems is that the educational and theoretical frameworks don't get as much attention as the technological components do (Padayachee, 2017).

Principals' leadership skills can stimulate teachers to create Flipped classrooms which are dynamic and establish an interactive learning environment. It fosters student guided learning as learners are turned to researchers through the use of advanced technologies, individuals engage in higher-order tasks like exploratory learning and problem-based learning because the teacher exposes the reading materials ahead of time. This will adjust the pace of learning of learners to meet individualized study style. The focus shifts to students as teachers observe learning taking place, facilitate and give real time and adaptive feedback (Loizou, 2022).

The education of the students is greatly influenced by the teachers. The teaching discipline's student profile must include competencies in technological change, complexity-based reasoning, civic and ethical dedication, behavioral intelligence and creative entrepreneurship. An Education 4.0 model also requires these abilities. To improve educational quality, instructors must become more digitally literate. For the new situations, teachers need to possess skills in entrepreneurship,

innovation, creative problem-solving, analytical thinking, and research (Ramirez-Montoya et al., 2021). Skills of the twenty-first century: These are the most crucial qualities and standards that secondary school administrators must meet in order to stand out, and they manifest themselves as indications as they carry out their duties to bring about the necessary educational transformation (Thaher, 2020).

2.4 ICT Security and digitalization

Teachers are required to assist learners through online practices by using digital technologies. This will make teachers to become innovative in how they are addressing pertinent issues such as the digital wellbeing of themselves and their students and how effectively they are using digital devices to support teaching and learning and how to find sources of information through digital media, accessibility and assessing their relevance, credibility and reliability. According to the Digital Competence Framework there should be Communication and collaboration among the school community as they interact with digital devices, establishing their digital identity and observing etiquette. Principals need to attend to the well-being of students, including safeguarding personal information and privacy as well as ensuring their health and safety (Passey, 2021).

Teachers may effectively assist students in accessing digital resources for worthwhile learning experiences that fit with curricular objectives by introducing digital aspects into educational institutions. However, they are also accountable for teaching pupils the value of cybersecurity and how to protect their online privacy. They should also assist parents in comprehending the advantages and possible hazards associated with technology. It is essential to teach and empower

parents and kids in the responsible and secure use of digital platforms and technologies in order to foster a culture of online safety (Yehya, 2021).

The danger of illegal access, manipulation, interruption, and natural calamities is typically present with regard to ICT resources. The school shall implement the necessary control mechanisms to guarantee that its ICT resources are protected in an attempt to secure the ICT equipment and systems and assure their availability. It is necessary to set suitable safeguards to restrict access to ICT facilities, computer equipment, and data (*GoK*, 2018).

2.5 Competency readiness of Principals and digitalization

There are six areas of expertise for teachers: technical, didactic, pedagogical, evaluative, communicative, and attitudinal. Two primary domains were suggested by another study: digital and instructional skills. Additionally, pedagogical abilities are impacted by technical skills. The "ICT Competency Framework for Teachers" (ICT CFT) was created by UNESCO to assist pre- and in-service teachers in their training about the use of digital technology in the classroom. The "ICT CFT" consists of three competency levels, six areas of teachers' professional activity, and 18 competencies. Many educational systems, including those in Egypt and Kenya. Teachers' efficacy as instructors may be improved by providing them with high-quality initial digital education and by fostering their ongoing professional growth and cooperation (Perifanou et al., 2021). It has been shown that a person's level of technology self-efficacy affects their choice of whether to use and accept computers in general. According to study, instructors' level of computer self-efficacy may have an impact on how frequently and how ICT is utilized in routine classroom activities. According to research on teachers' use of ICT in the classroom, attitudes can either have a direct

or indirect impact on how they utilize technology. Teachers' inspiration is a direct element that will support innovative use of ICT, and it is frequently claimed that positive attitudes toward ICTs and/or their usage in education are enabling factors while negative attitudes are hindering ones (Player-koro, 2012).

Collaborative settings address the context of technologically advanced settings for design-related communication. Through the integration of information, cross-disciplinary cooperation enables one to fully use digitalization in architectural design. Technology is not seen in digital ecologies as a supporting or subordinate activity to conventional design. Digital ecologies consider every tool at the architects' disposal. The creative process that leads to the creation of knowledge is addressed in the method of architectural design. This information serves as a foundation for experimental research and analytical techniques that define innovative and creative goods (Zupancic et al., 1970).

2.6 Theoretical framework

This study was grounded on the following theories

Technology Acceptance Model

The widely accepted Technology Acceptance Model (TAM), which Davis et al. published in 1989, is used to describe the elements influencing teachers' willingness to use technology. This model successfully explains the causal relationships between its core parts. "Perceived Usefulness" (PU) and "Perceived Ease of Use" (PEU), two key components of TAM, collectively predict a person's propensity to embrace technology. According to Davis et al. (1989), PU is defined as the degree to which a technology improves user performance whereas PEU relates to the effort a person

perceives is necessary while utilizing a particular technology, such as encouraging more contact between students and professors. These two factors have a direct impact on instructors' intentions to employ technology. Despite the fact that in the initial iteration of TAM attitude was viewed as a variable in between PU, PEU, and purpose of use. The strength of this theory is easier to use and less expensive to apply. The weakness of this theory is that behavior of the users is evaluated by subjective means and it focuses on internal aspects and ignores the external factors out of technology itself (Li, 2022).
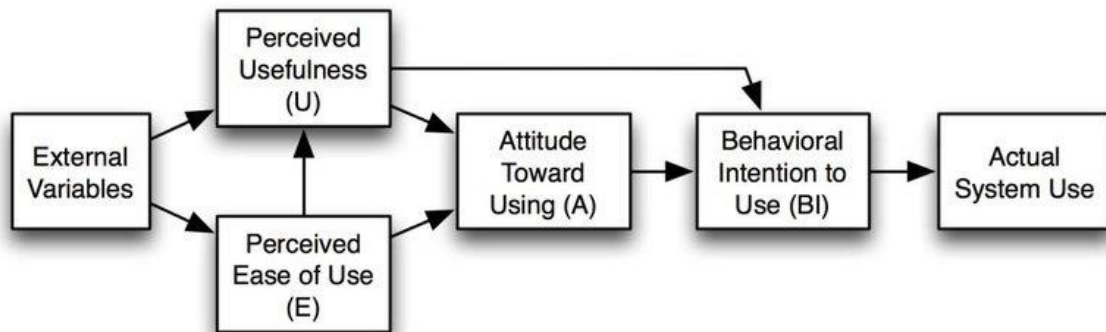
Technological Pedagogical and Content Knowledge

Shulman's model was revised by Mishra and Koehler (2006), who included technological knowledge (TK) as a third crucial component that describes the complex cognitive process of teaching. This idea was taken from Shulman's (1986) idea of Pedagogical Content Knowledge (PCK), which clarifies the relationship between pedagogical knowledge (PK) and content knowledge (CK). Secondary knowledge forms such as pedagogical content knowledge (PCK), technical content knowledge (TCK), technological content knowledge (TPK), and eventually the

combined construct—TPACK—are produced by the dynamic interaction between these three fundamental elements (Mishra and Koehler, 2006). To offer successful instruction using ICT, this method interweaves both technological and academic elements (PK and CK). The use of TPACK as a framework for assessing teaching knowledge may have an influence on the kind of training and professional development experiences created for both pre-service and in-service teachers. It is an effective structure for considering what expertise instructors require to incorporate technology into imparting knowledge and how they might develop this knowledge. It also provides a theoretical lens for describing whether a teacher can successfully design and conduct technologically-based lessons. TPACK has been viewed as too complex by some educators. Similarly, some educators also believe that TPACK might not be practically useful.
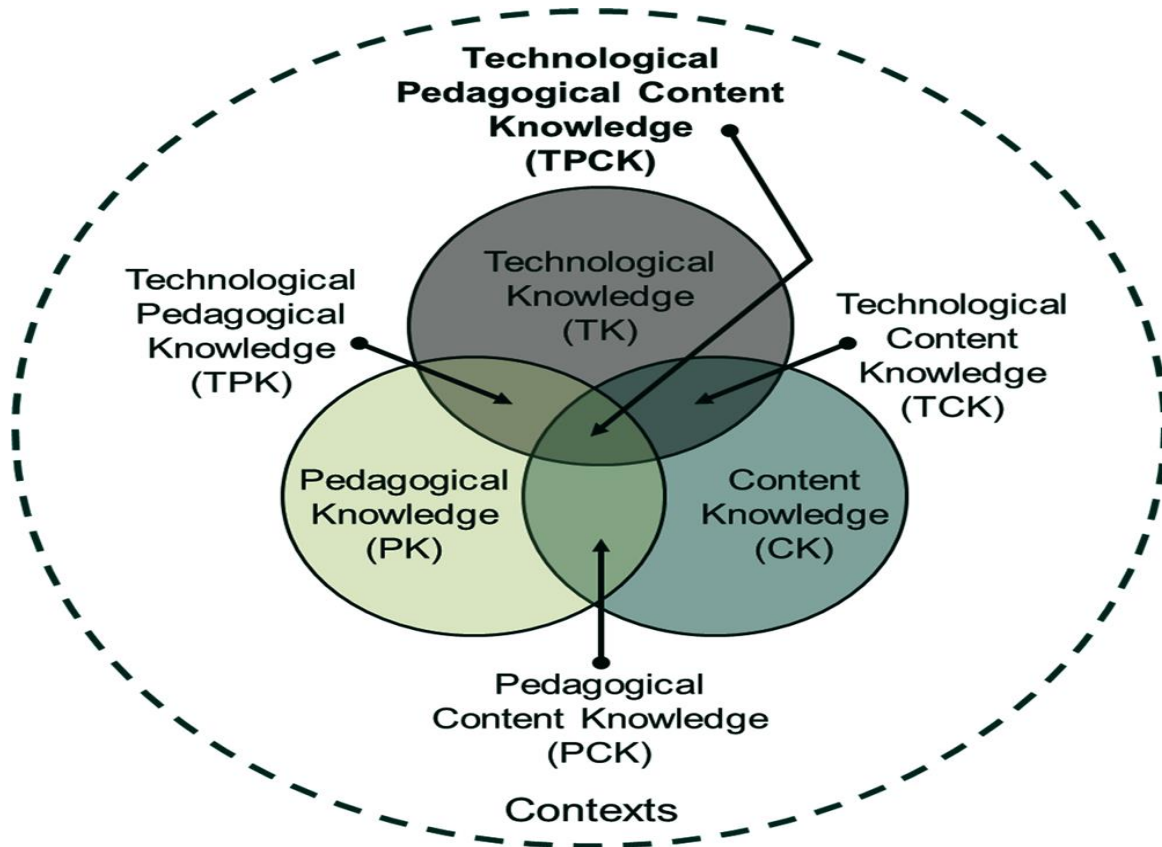
Source: tpack.org

2.7 CONCEPTUAL FRAMEWORK

Independent Variables: Organization digital readiness

Governance maturity

Communication,

Management Support/Resource mobilization,

Collaboration, Culture change management,

Security maturity

ICT Security, Safety and well-being, ICT

policy and strategies, ICT Laws and ethics,

technical support

Competency maturity

Agility, Learnability, ICT set skills and
Training

Technological maturity

ICT Infrastructure, Hardware, Software-
Teaching, learning and Assessment

Dependent Variable

Digital Transformation

- KCSE School Results
- Digital Competent Educators
- ICT Clubs, Champions and badges
- Empowered, Competent and lifelong Learners
- Networking and Professional Learning Communities.
- Continuous Professional Development(CPD) and Community of Practice

Intervening Variables

Ministry of Education guidelines

Age of the participants

Status of the School

22

ICT competency can be divided into four sequential levels namely digital awareness which entails knowing what computer can do, understanding of the internet, sending and receiving emails and gaining computer confidence. This are typical skills. Second level is Digital Literacy-Skills for everyday life which include preparing documents, organizing and receiving emails crating and editing spreadsheet and recognizing internet security. Third level is Digital competence which are skills for the workplace that involves working with images, preparing presentations, working collaboratively online and managing data security. The fourth level is digital expertise that encompasses skills such as conducting budgetary analysis, preparation of advance reports and high impact presentations. **Digital governance** is all about streamlining processes and improving services. Organizations need to experiment with technologies to find an approach that works and will best serve their needs(Toolkit, n.d.)

ICT security readiness, administrators who would wish to adopt new technologies need to be aware of host of issues associated with digitalization which include vulnerability of their ICT infrastructure to attacks such as data breaches, lack of employee security awareness and the risks involved. They should also come up with ways of improving security. **Technological readiness** can foster different modes of learning such as traditional, online and hybrid learning which can be asynchronous or synchronous which can be facilitated by learning management systems such as Zoom, google classrooms, Canvas and blackboard learn. Digital learning resources can supplement course content this include Khan Academy, MOOCs, podcasts, Quiz lets and e-textbooks(Skills, n.d.)

2.8 Summary of Literature review

The explosion and extension of knowledge in modern society requires us to constantly enhance our own abilities in order to stay up with these rapid changes in knowledge and information. The ability to enhance the caliber and efficacy of instruction is made possible by a broad network of informational resources, outstanding multimedia capabilities, and multiliteracies functionality. A very informational educational period is upon us, and multimedia learning is both a time need and an unavoidable option for education (Idrisova et al., 2021).

CHAPTER THREE

RESEARCH   METHODOLOGY

3.1 Introduction

This chapter highlighted the research methodology and the processes through which data was collected and analyzed.

3.2 Research Design

In this study, the research employed a descriptive survey approach, which integrates both quantitative and qualitative methodologies. Because the data acquired required both quantitative and qualitative analysis, the approach was suited for this study. Quantitative approaches enable researchers to ask precise questions and collect measurable data from huge groups of people. The study used a cross-sectional approach, which produces data fast and gives a picture of a population's current behaviors, attitudes, and beliefs. This was conducted to collect views from participants at different levels namely Principals, teachers and students. This design was descriptive to help the researcher collect information within a short time.

3.3 Target Population

The study's participant pool was selected from secondary schools located in Kipipiri Sub County, Nyandarua County. Consequently, the intended population encompassed all 16 high schools situated within the Kipipiri. The research study's target audience included 16 school principals, 5 department heads from each school, and 10 Form 4 students from each secondary school in Kipipiri Sub County. There were 160 Form 4 pupils, 16 principals, and 80 department heads. The research was restricted to secondary schools.

Table 3.1: Target Population

Category	Target Population
Form 4 students	1242
Principals	16
Heads of departments	80
Total	1338

Source: Researcher (2023)

Majority of the participants in the study were Form 4 students and teachers below the age of 25 who accounted for 65% of the sample. Form four students were selected since they had knowledge of digital technologies available in the school and technological practices of their teachers and principals. Principals above 50 years of age and above were 9 and between 46 and 50 were 7. 66 females and 78 males participated in the study representing 45.8% and 54.2%. Gender is imperative in any study to bring the distinct perspective and how gender disparities influence the adoption of digital technologies consequently affecting organization digital readiness of schools.

3.4 Sample size and sampling procedure

A sample is a group of instances collected or chosen from a larger group or population of cases, generally with the goal of estimating characteristics of the larger group or population, and the number of cases investigated is referred to as sample size (Cramer., Howitt, 2007). The study employed a stratified sampling strategy to sample the schools in terms of Extra County, County, and Sub County schools. To eliminate biases, stratification was employed to collect information

from various genders. The respondents were then chosen at random. Purposive sampling was utilized to create interview dates for all 16 school administrators. The purposeful technique involves a statistical inquiry where data is gathered from specific elements or units within the researcher's target population. Because this form of inquiry considers every member of a population, the results are more precise and trustworthy (Byju's, 2020). The study's confidence level was set at 95%, with a margin of error of 5%. The researcher calculated the sample size of form 4 students and HODs using Yamane's (1967) formula, which is as follows:

Equation 1: Determination of sample size equation

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

Where;

n = Sample size; **N** = Population under study; **e = 5%** error; and **1** = Constant

The sample size was calculated as;

$$n = \frac{240}{1+240(0.05^2)}$$

n = 150 respondents

Table 3.2 Sample size data

Category	Sample size
Form Four students	97
HODs	53
Principals	16
Total	166

Source: Researcher (2023)

3.5 Questionnaire return rate

The research responders were given the questionnaires in Nyandarua County's Kipipiri Sub County. According to Table 4.1, 144 questionnaires (86.7%) from the questionnaires were properly returned. Given that the researcher physically visited each sampled school and delivered the relevant questionnaires, the return rate was high.

Table 3.3 Response Rate

Category	Frequency	Percentage
Returned	144	86.7
Not returned	16	13.3
Total	**160**	**100**

3.6 Demographic characteristics of respondents

In order to assess the respondents' personalities in relation to how well they understood the veracity and dependability of the information they supplied, the research collected personal information about the respondents. The researcher was interested in determining the respondents' ages and genders.

3.6.1 Age of the respondents.

Age-related groups of participants were compelled to fill in their ages. This is crucial because it enables us to assess whether the responders were evenly dispersed.

Table 3.4: Distribution of respondents by age

Age	Frequency	Percent
Below 25	94	65
26-35	12	8.3
36-45	22	15
46-50	7	5
Above 50	9	11.7
Total	144	100

The majority of respondents—94 or 65%—were under 25 years old. This was made up of form 4s from the schools. They were pertinent in this research since they are the biggest winners from the school digitization practices. The minority (7, or 5%) were aged 46 to 50. The participants' ages provide insight into their degree of maturity and the approach they take to providing answers. In this case, the researcher chose the form 4 students since they had been attending school for some time and were, on average, 18 years old, enabling them to respond to the discussion subjects with objectivity.

3.6.2 Gender of the respondents

The study considered the participants' gender as a factor. This was necessary to compute the ratio of male to female participants. This insight on the significance of gender balance was crucial. A table showing replies by gender is shown.

Table 3.5: Distribution of respondents by gender

Gender	Frequency	Percentage (%)
Female	66	45.8
Male	78	54.2
Total	144	100.0

The table shows that male respondents made up the majority (54.2%) while female respondents made up 45.8%. This demonstrates that survey participants of both genders took part. Gender has an impact on how people perceive their surroundings in social and biological ways. Men and women view the world and their lives from different angles. The researcher was better able to comprehend how gender differences affected the respondents' responses to the questions by knowing the respondents' gender.

3.7 Research Instruments

Interview and questionnaire schedules were employed in this investigation. The conceptual framework's variables were used in the development of the instruments to gather data from research participants. Schedules for interviews with principals and Teachers (HoD) and students were provided questionnaires by email or drop-and-pick distribution. This was done to make sure that whatever the principals in the interview stated matched up with what actually occurred in the classroom, which the students and instructors in the questionnaire would corroborate. The survey was unstructured. The usage of questionnaires resulted in time and cost savings as well as simplified data processing (Oyolla, 2019). 144 questionnaires (86.7%) were duly returned from the dispersed questionnaires. The researcher physically visited each of the chosen schools and carried

out the distribution of the predetermined questionnaires, which significantly increased the return rate. However, some respondents such as the HoDs refused to take part in the study failing to give reasons for the same. This study showed that the response rate was high thus was deemed to adequate for both analysis and interpretation of data.

3.7.1 Validity of the instrument

The question of whether or not an indicator (or group of indicators) created to measure a notion actually measures that concept is known as validity. This is established by how well it measures and executes the intended functions (Biddix, 2016). Pilot study was done from 5 schools in Kinangop Sub County to obtain feedback about time to complete the questionnaire, clarity and length. This also ascertained that the instruments were appropriate and not biased.

3.7.2 Reliability of the instruments

Reliability refers to the consistency of a measure of a concept. The piloted results from Kinangop sub county schools were used to see if they produced results that were reasonably comparable. Reliability index was calculated using Cronbach's alpha. It was calculated using the Formula

$$\alpha = \frac{N\underline{C}}{\underline{V} + (N-1)\underline{C}}$$

Where N is the number of Items.

C is the average inter-item covariance.

V Average Variance.

The researcher used the completed questionnaire to generate the Cronbach Alpha Coefficients. These are compiled below.

Table3.6:Reliability
Results

	No. of Items	Cronbach Alpha Coefficient
School digitalization	5	.805
BoM readiness	4	.777
ICT security readiness	4	.807
Competency level	4	.732
Technological readiness	4	.712

Because the research tool utilized in this study to gather data had a very high Cronbach's alpha coefficient of over 0.7, it was thought to be reliable. The researcher's regular meetings with the supervisor and other experts in the educational field at the Sub County and County levels significantly improved the research instrument's content validity. To help respondents grasp the contents of the questionnaire, simple language was also employed when constructing the study instrument. These Cronbach's alpha values are in line with Yin's (2017) recommendation of a dependability criterion of 0.7 and above.

3.8 Data collection Procedures

Through the graduate school of the University of Nairobi, a research permission was requested from NACOSTI in order to gather the necessary data. The Ministry of Education's Nyandarua office and Kipipiri were asked for their approval. The researcher next contacted head of institutions of the chosen secondary schools, informing them directly of the upcoming study. Thereafter, the instruments were self-administered to teachers and learners.

3.9 Data analysis techniques

The field data in Microsoft Excel format was downloaded, reviewed for accuracy, and adjusted as needed. The data collected was coded and analyzed with SPSS. These data were then presented in the form of tables and charts, together with statistical averages and measures of dispersion. Descriptive analysis was undertaken, for the close ended questionnaire data followed by an inferential analysis to determine how the variables relate to one another. Additionally, the Pearson linear correlation coefficient was used to examine potential correlations between the different operational variables

$$ r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}} $$

R =correlation coefficient

xi =Values of the X variable in a sample

$\tilde{\text{x}}$ =mean of the values of the x variable

yi =Values of the y variable in a sample

$\tilde{\text{y}}$ =Mean of the values of the y variable

Finally, the possible dependency between the various operational variables was investigated using simple linear regression. The effectiveness of several scales of questions on the styles of leadership and their effects was evaluated using the Cronbach's Alpha Credibility Index. Additionally, all research questions assessments for predictive tests, correlations, and linear regressions employed a validity criterion of 0.05.

3.10   Ethical Considerations

While gathering information, the researcher informed the respondents that the information would only be used for academic purposes. Where required to protect the respondent's privacy, informed consent was acquired. The researcher upheld the confidentiality rule. Information submitted by research participants was kept private and confidential. The researcher did not use dishonest methods or enticements to get information from the respondents.

CHAPTER FOUR

DATA ANALYSIS AND SUMMARY OF THE FINDINGS.

4.1 Introduction

The chapter presents data analysis on digitalization of secondary schools, governance readiness and digitalization of secondary schools, security and support readiness, influence of competency readiness on digitalization of secondary schools, technological readiness and digitalization of secondary schools, the regression model and Summary of the findings are then highlighted at the end of the chapter.

4.2 Descriptive Statistics for Digitalization of secondary schools

In order to gauge the degree of digitalization in secondary schools, four components were presented to respondents. Respondents were asked to rate statements on a Likert scale from strongly agree (strongly agree) (5) to strongly disagree (1) using a 5-point category system. Based on the percentages, means, and standard deviations, Table 4.5 further examined and summarized this data.

Table 4.1: Digitalization of secondary schools

STATEMENTS	5	4	3	2	1	Mean	SD
Digitalization has a positive impact on KCSE school results.	28.7%	40.6%	11.7%	9.7%	9.3%	4.33	0.512
Digitalization has resulted in an adequate number of digitally skilled educators.	16.3%	23.3%	35%	15%	10.4%	3.06	0.921
Digitalization has resulted in empowered and ICT-savvy students in the classroom.	23.6%	37.3%	13.3%	17.1	10.7%	3.74	0.724
Digitalization has made it simple to connect with other schools in the neighborhood.	25%	36%	15.3%	15.4%	8.3%	4.1	0.746
Composite/Average mean						3.81	0.708

N=144

Table 4.1 focuses on the digitalization of secondary schools. Based on the findings, the study participants agreed that digitalization has a positive impact on KCSE school results (Mean=4.33, SD=.512). The participants were not so sure whether digitalization had resulted in an adequate number of digitally skilled educators (Mean=3.06, SD=.921). Participants agreed that digitalization has resulted in empowered and ICT-savvy students in the classroom (Mean=3.74, SD=.724). Additionally, they agreed that digitalization has made it simple to connect with other schools in the neighborhood (Mean=4.1, SD=.746).

The composite mean for all the constructs was 3.81 with a standard deviation of 0.708 implying that majority of the respondents do agree that there were efforts to digitize secondary schools and that the digitalization efforts have significant impact on the schools. These findings agree with a number of researches. For instance, according to Cheng, Y. C., and Mok, M. C. (2019), digital transformation in school education positively impact on student performance. It influences on students' learning outcomes, engagement, and motivation. Another study by Hall Giesinger, C. (2021) studied the emerging technologies and their impact on K-12 education. It highlighted the positive outcomes of digitalization, including increased student engagement, improved academic performance, and enhanced collaboration among students and teachers.

4.3 Descriptive statistics for Governance readiness and Digitalization of secondary schools

A five-point rating system was used to collect the respondents' thoughts. The respondents were shown four constructs as gauges of governance preparation.

Table 4.2: Governance readiness

STATEMENTS	5	4	3	2	1	Mean	Std. Dev.
The majority of educational communication is done digitally	20.7%	36.6%	19.4%	12.7%	10.6%	3.82	0.887
The majority of school stakeholders are encouraged by the usage of ICT in many school functions	20%	38%	15%	17.3%	9.7%	3.72	0.731
Both students and instructors are passionate about the use of ICT in learning and other school activities.	28.1%	39.3%	14.3%	10.3%	8%	4.12	0.535
The administration firmly supports digitalization in our school by providing the required tools and resources	20.7%	34.3%	19.3%	15.7%	10%	3.71	0.621
Composite/Average mean						3.84	0.694

N=144

The participants in the survey concurred that the majority of educational communication is conducted digitally (Mean=3.82, SD=.887) and that the use of ICT in many school operations encourages the majority of stakeholders in the educational system (Mean=3.72, SD=.731). The majority of respondents (Means =4.12, SD=.555) agreed that both students and teachers are enthusiastic about using ICT in the classroom and other educational activities. Last but not least, the survey participants concurred that our school's administration fully supports digitalization by providing the necessary tools and resources (Mean=3.71, SD=.621). 3.84 was the average across all constructs. This shows that governance preparation was sufficient, which accelerated secondary school digitization.

4.3.2 Correlation between Governance readiness and Digitalization of secondary schools

Correlation analysis, which gauges the strength of the link between two variables, was used to investigate the relationship between governance preparedness and the digitalization of secondary schools. The key variable used to calculate this association was governance preparedness ratings, while the dependent variable was secondary school digitalization.

Table 4.2.1 Correlation for Governance readiness and Digitalization of secondary schools

		Digitalization of secondary schools
Governance readiness		
	Pearson Correlation	.700**
	Sig. (2-tailed)	.000
	N	144

**Correlation is significant at 0.01 level (2 tailed) r = 0.700, N = 144, P<.01

Table 4.2.1's findings showed a strong positive association (r=.700 N=144 p.01) between the effect of secondary schools' governance preparation and digitalization. This finding is in line with a research by Fernandez, R., and Albuquerque, A. (2019), which looked at the variables impacting teachers' use of digital tools in the context of education's digital transformation. It emphasized the significance of governance preparedness, which includes backing from school administration, availability of resources and training, and transparency of policies, in promoting teachers' adoption and use of digital technology. The research also aligns with Coles, L., and O'Gorman, L. (2019), who looked at the variables impacting the implementation of effective e-learning projects in schools. It emphasized the significance of governance readiness, including strategic planning,

39

policy development, and stakeholder involvement, in ensuring effective integration of digital technologies.

4.3.3 Regression Analysis for Governance readiness and Digitalization of secondary schools

The study employed a coefficient of determination (R2) utilizing regression analysis to ascertain if governance preparedness was a significant predictor of secondary schools' digitalization.

Table 4.2.2 Regression analysis for secondary school digitalization and governance preparedness

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.700[a]	.664	.601	.565

Predictors: (*Constant*), governance readiness, Dependent variable: Digitalization of secondary schools

The R value in Table 4.2.2 stands at.700, indicating a very substantial positive impact of governance preparation on secondary schools' digitalization. R2 demonstrates a variance of.664 on secondary school digitalization brought on by governance preparedness.

An ANOVA test was also carried out to see if governance preparation was a significant predictor of secondary school digitalization.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.309	1	55.309	182.234	.000[b]
	Residual	131.117	143	.774		
	Total	186.426	144			

a. Dependent Variable: Digitalization of secondary schools

b. Predictors: (Constant), Governance readiness

From Table 4.2.3 where [F (1, 143) = 182.234, P<.05] it is evident that governance readiness influences digitalization of secondary schools   and thus a significant predictor.

4.4 Security and support readiness and Digitalization of secondary schools

The study sought to establish whether Security and support readiness of the school determines digitalization of secondary schools.

Table 4.3: Security and support readiness of the school and Digitalization of secondary schools

STATEMENTS	5	4	3	2	1	Mean	Std. Dev
The use of ICT materials in the school is well-coordinated.	11.7%	18.6%	20.4%	30.7%	21.6%	2.35	0.887
The school's ICT materials are well protected.	15%	16%	20%	31.3%	18.7%	2.43	0.832
The school administration promotes a culture shift in the acceptance and usage of ICT in the classroom.	12.1%	15.3%	14.3%	32.3%	25%	2.34	0.602
The school administration has implemented ICT policies and plans.	23.7%	30.3%	16.3%	15.7%	14%	3.71	0.687
Composite/average mean						**2.72**	**0.752**

N=144

According to Table 4.3.1 (r=.632 N=144 p.01), the findings revealed a substantial positive connection between the effect of the school's preparedness for security and support and the digitalization of secondary schools. This conclusion is consistent with several research on the effects of support preparedness and school security. For instance, according to a research by Chatterjee et al. (2018), all schools that have enough administration and stakeholder support for ICT deployment are successful in digitizing their educational institutions. Similar to this, (Bhattacharyya, 2019; Datta and Sahu, 2017) contends that the most significant motivational factors for ICT adoption in education were the ICT infrastructural security. Devices such as school

computers are a target for theft and as such institutions should institute measures to protect their ICT tools and equipment.

4.4.2 Correlation for Security and support readiness of the school and Digitalization of secondary schools

To ascertain the association between security and support readiness of the school and digitalization of secondary schools, correlation analysis was carried out.

Table 4.3.1: Correlation for Security and support readiness of the school and Digitalization of secondary schools

		Digitalization of secondary schools
Security and support readiness of the school	Pearson Correlation	.632[**]
	Sig. (2-tailed)	.000
	N	144

**Correlation is significant at the 0.01 level (2-tailed).   r = 0.632, N = 144, P<.01

The results show a strong and positive association between the two variables. This finding is in line with a number of studies on the impact of schools' support and security preparation. For instance, a study by Chatterjee et al. (2018) contends that all schools that have enough administration and stakeholder support on ICT implementation excel in digitalization of their educational institutions. Similar to this, (Bhattacharyya, 2019; Datta and Sahu, 2017) contends that the most significant motivational factors for ICT adoption in education were the ICT infrastructural

security. Devices such as school computers are a target for theft and as such institutions should institute measures to protect their ICT tools and equipment.

Table 4.3.2 Regression analysis for Security and support readiness of the school and Digitalization of secondary schools

Model Summary

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	.632[a]	.551	.502	.435

a. Predictors: (Constant), Security and support readiness of the school

The R value for Table 4.3.2 is 0.632, indicating a significant impact of the school's security and support preparedness on the digitalization of secondary education. R2 indicates a.551 variance in secondary school digitalization due to the institution's security and support preparedness.
ANOVA analysis was also performed to see if the school's security and support preparedness was a significant predictor of secondary schools' use of digital technology.

Table 4.3.3 ANOVA of Security and support readiness of the school and Digitalization of secondary schools

Model		Sum of Squares	D.F	Mean Square	F	Sig.
1	Regression	45.188	1	45.188	128.332	.000[b]
	Residual	141.238	143	.341		
	Total	186.426	144			

a. Dependent Variable: Digitalization of secondary schools

b. Predictors: (Constant), Security and support readiness of the school

From Table 4.3.3 where [F (1, 143) = 128.332, P<.05] it is evident that security and support readiness of the school influences digitalization of secondary schools and thus a significant predictor.

4.5 Influence of Competency readiness on Digitalization of secondary schools

The study sought to investigate how competency readiness influences digitalization of secondary schools.

Table 4.4: Competency readiness and Digitalization of secondary schools

STATEMENTS	5	4	3	2	1	Mean	Std. Dev.
Our principal is quick to integrate new ICT technology and encourages others to do the same.	20.7%	30.6%	23.4%	11.7%	12.6%	3.81	0.725
The school principal is capable of learning new ICT technologies and disseminating the information to the rest of the school.	10%	13.3%	23%	27%	27.7%	2.31	0.841
The school principal is knowledgeable and skilled in the use of ICT.	9.1%	20.3%	19.3%	28.3%	23%	2.80	0.755
School educators receive training on how to use ICT in instructional learning and teaching.	20.7%	30.3%	23.3%	12.7%	13%	3.61	0.677
Composite/Average mean						**3.13**	**0.750**

N=144

The study findings on secondary school digitalization and competence preparedness are shown in Table 4.4. Participants generally concurred that school administrators quickly implement new ICT and urge others to follow suit (Mean=3.81, SD=.725). The study participants disagreed that the school principals are capable of learning new ICT technologies and disseminating the information to the rest of the school (Mean=2.31, SD=.841) and that the school principals are knowledgeable and skilled in the use of ICT (Mean=2.80, SD=.755).

On the other hand, respondents agreed that school educators receive training on how to use ICT in instructional learning and teaching (Mean=3.61, SD=.677). The average mean for all constructs

was 3.13. This denotes that respondents generally are not sure whether school principals were competent enough on the issue of digitalization of schools.

4.5.2 Correlation for Competency readiness and Digitalization of schools

To examine the link between the two, a correlation analysis was done to determine the scores for competence preparation as an independent variable and digitalization of secondary schools as a dependent variable. Table 4.16 demonstrates this connection.

Table 4.4.1: Correlation for Competency readiness and Digitalization of secondary schools

		Digitalization of secondary schools
Competency readiness		
	Pearson Correlation	.774[**]
	Sig. (2-tailed)	.001
	N	144

**Correlation is significant at the 0.002 level (2-tailed).   r = 0.774, N = 144, P<.01

According to Table 4.4.1, there is a significant positive correlation between the effect of competence preparation and the digitalization of secondary schools (r=.774 N=144 p.01). These findings are in line with a study by Bakri (2021), which discovered that integrating ICT into education has the potential to enhance teaching and learning experiences, promote student participation, and support the development of essential 21st-century skills. But the adoption of ICT in schools depends on how well teachers can incorporate technology into their teaching strategies. They also agree with a 2018 ILO study that claims that programs for professional development and teacher training are vital for enhancing teachers' ability to utilize ICT. Studies suggest that

comprehensive and ongoing training programs that focus on both technical skills and pedagogical knowledge positively impact teachers' abilities to integrate technology effectively.

4.5.3 Regression analysis for Competency readiness and Digitalization of secondary schools

The study employed Regression analysis to determine the effect of competence preparation and if it is a significant predictor of the digitalization of secondary schools.

Table 4.4.2 Regression analysis for Competency readiness and Digitalization of secondary schools

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.774[a]	.662	.583	.463

a. Predictors: (Constant), Competency readiness

The R value in Table 4.4.2 is.774, indicating a significant beneficial impact of competence preparation on secondary schools' digitalization. R2 indicates.662 on variance in secondary school digitalization due to competency preparedness.

To determine if competence preparation was a significant predictor of secondary schools' digitalization, an ANOVA test was also conducted.

Table 4.4.3 ANOVA of Competency readiness and Digitalization of secondary schools

Model		Sum of Squares	D.F	Mean Square	F	Sig.
1	Regression	52.954	1	52.954	143.243	.000[b]
	Residual	133.472	143	.449		
	Total	186.426	144			

a. Dependent Variable: Digitalization of secondary schools

b. Predictors: (Constant), Competency readiness

From Table 4.4.3 where [F (1, 143) = 143.243, P<.05] it is evident that competency readiness influences digitalization of secondary schools and thus a significant predictor.

4.6 Technological readiness and Digitalization of secondary schools

Analysis was done to ascertain the influence of this fourth objective on the digitalization of secondary schools.

STATEMENTS	5	4	3	2	1	Mean	Std. Dev.
Our school has adequate ICT infrastructure in place.	13.7%	18.6%	14.4%	29.7%	25.6%	2.72	0.647
There is a variety of hardware available for use in educational programs.	10%	12%	10%	38.3%	30.7%	2.00	0.651
School digital hardware have the necessary software for their operation.	10%	12.3%	15.3%	37.3%	25.1%	2.35	0.735
The school provides adequate ICT instruction and assessment of students.	12.7%	14.4%	22.3%	31.7%	18.9%	2.44	0.610
Composite/Average mean						**2.38**	**0.671**

N=144

This section focused on how prepared schools were technologically for ICT integration. The study results are shown in Table 4.10. Participants disputed that educational institutions had enough ICT infrastructures (Mean=2.72, SD=.647) and that there is adequate ICT hardware for use in educational programs (Mean=2.00, SD=.651). Participants also disagreed school's digital hardware had the necessary soft wares for operation (Mean=2.35, SD=.735). Lastly, participants further disagreed that schools provide adequate ICT instruction and assessment of students

(Mean=2.44, SD=.610). The overall mean for the study was 2.38 which implies that most participants disagreed that schools were technological ready for digitalization.

4.6.2 Correlation for Technological readiness and Digitalization of schools

The scores for technological preparation as an independent variable and the association between secondary school digitalization and technological preparedness were determined by correlation analysis.

Table 4.5.1: Correlation for Technological readiness and Digitalization of secondary schools

		Digitalization of secondary schools
Technological readiness		
	Pearson Correlation	.677[**]
	Sig. (2-tailed)	.000
	N	144

**Correlation is significant at the 0.01 level (2-tailed).   r = 0.677, N = 144, P<.01

According to Table 4.5.1, there is a significant correlation between the effect of technical preparedness and the digitalization of secondary schools (r=.677 N=144 p.01). These findings support the claims made by Hartina et al. (2018) that technology preparedness impacts teaching practices in a favorable way by enabling novel instructional techniques, individualized learning experiences, and collaborative learning settings. Effective integration of ICT supports the development of critical thinking, problem-solving, and digital literacy skills among students. In their study, Padmaja and Cynthia (2019) express similar sentiments, noting that technological

readiness contributes to increased student engagement and improved academic achievement. When students have access to ICT resources and tools, they are more likely to be motivated, actively participate in learning, and demonstrate higher levels of achievement.

4.6.3 Regression analysis for Technological readiness and Digitalization of secondary schools

The study employed a coefficient of determination (R2) utilizing regression analysis as stated in Table 4.5.2 to examine the extent of technological readiness's effect and if it was a significant predictor of secondary schools' digitalization.

Table 4.5.2: Regression analysis for Technological readiness and Digitalization of secondary schools

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.677[a]	.562	.522	.431

a. Predictors: (Constant), Technological readiness

The R value in Table 4.5.2 is.677, indicating that technology preparedness has a considerable effect on secondary school digitalization. R2 is.562 on the variance in secondary school digitalization caused by technological preparedness.

An ANOVA test was also performed to see whether technological preparedness was a significant predictor of secondary school digitalization.

Table 4.5.3: ANOVA of Technological readiness and Digitalization of secondary schools

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	75.124	1	75.124	130.110	.000[b]
	Residual	111.302	143	.386		
	Total	186.426	144			

a. Dependent Variable: Digitalization of secondary schools

b. Predictors: (Constant), Technological readiness

From Table 4.5.3 where [$F (1, 143) = 130.110$, $P<.05$] it is evident that technological readiness influence digitalization of secondary schools   and thus a significant predictor.

4.7 The Regression Model

To ascertain the significance of the independent variables concerning the dependent variable—digitalization of secondary schools—this study used a multivariate regression model. This is useful in establishing the predictive factors' statistical significance in this investigation. The study looked at how well the predictor variables would forecast the digitalization of secondary schools. The employed regression model looked like this;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

53

Y = digitalization of secondary schools

β_0 = Y intercept

$\beta_1, \beta_2, \beta_3, \beta_4$ = the slope of the regression line for each independent variable

X_1 = Governance readiness

X_2 = Financial and security and support readiness of the school

X_3 = Competency readiness

X_4 = Technological readiness

$\mathcal{E}$ = Error term.

Table 4.6: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.734[a]	.709	.717	.403

a. Predictors: (Constant), governance readiness, security and support readiness of the school, Competency readiness, technological readiness
b. Dependent variable: digitalization of secondary schools

The R value, which represents the correlation between the predictors and the dependent variable, was .734 in Table 4.6. The findings indicated that governance preparedness, school security and support readiness, competency readiness, and technology readiness all had a significant impact on secondary school digitalization. In our sample data, the coefficient of determination (R^2) indicated

the proportion of variability in the dependent variable that was explained by the predictor(s), which was.709, or 70.9% of the variance in secondary school digitalization as a consequence of the independent factors. R^2 is always between 0 and 100%, with a score of 0 indicating no variability in the response data and a level of 100% proving that the model describes all variability in the response data around its mean.

4.8   Summary of the Findings

Table 4.1 focuses on the digitalization of secondary schools. Based on the findings, the study participants agreed that digitalization has a positive impact on KCSE school results (Mean=4.33, SD=.512). The participants were not so sure whether digitalization had resulted in an adequate number of digitally skilled educators (Mean=3.06, SD=.921).   Participants agreed that digitalization has resulted in empowered and ICT-savvy students in the classroom (Mean=3.74, SD=.724). Additionally, they agreed that digitalization has made it simple to connect with other schools in the neighborhood (Mean=4.1, SD=.746).

The composite mean for all the constructs was 3.81 with a standard deviation of 0.708 implying that majority of the respondents do agree that there were efforts to digitize secondary schools and that the digitalization efforts have significant impact on the schools.

The results are presented in Table 4.2. The participants in the survey concurred that the majority of educational communication is conducted digitally (Mean=3.82, SD=.887) and that the use of ICT in many school operations encourages the majority of stakeholders in the educational system (Mean=3.72, SD=.731). The majority of respondents (Means =4.12, SD=.555) agreed that both students and teachers are enthusiastic about using ICT in the classroom and other educational activities. Last but not least, the survey participants concurred that our school's administration fully

supports digitalization by providing the necessary tools and resources (Mean=3.71, SD=.621). 3.84 was the 3.84 average across all constructions. This shows that governance preparation was sufficient, which accelerated secondary school digitization.

According to Table 4.2.1, the effect of governance preparation and the digitalization of secondary schools have a strong positive association (r=.700 N=144 p.01). This finding is in line with a research by Fernandez, R., and Albuquerque, A. (2019), which looked at the variables impacting teachers' use of digital tools in the context of education's digital transformation. It emphasized how crucial governance preparation is to enabling teachers to adopt and use digital technology. This includes support from school administration, access to training and resources, and clear regulations. The study is also in line with Coles, L., and O'Gorman, L. (2019) which investigated the factors influencing the successful implementation of e-learning initiatives in schools. It emphasized the significance of governance readiness, including strategic planning, policy development, and stakeholder involvement, in ensuring effective integration of digital technologies.

The R value in Table 4.2.2 stands at.700, indicating a very substantial positive impact of governance preparation on secondary schools' digitalization. R2 demonstrates a variance of.664 on secondary school digitalization brought on by governance preparedness. An ANOVA test was also carried out to see if governance preparation was a significant predictor of secondary school digitalization. Table 4.2.3 presents a summary of the findings.

From Table 4.2.3 where [F (1, 143) = 182.234, P<.05] it is evident that governance readiness influences digitalization of secondary schools   and thus a significant predictor.

The focus of this section is security and support readiness of the school and digitalization of secondary schools. The study participants disagreed that the use of ICT materials in the school is well-coordinated (Mean=2.35, SD=.887), They also disagreed the school's ICT materials are well protected (Mean=2.43, SD=.832). They further disagreed that the school administration promotes a culture shift in the acceptance and usage of ICT in the classroom (Mean=2.64, SD=.602). Lastly, the participants agreed that the school administration has implemented ICT policies and plans (Mean=3.71, SD=.687). The overall mean for all the constructs was 2.72 which implies that participants were not so sure on the influence of security and support readiness of the school on the digitalization of secondary schools.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.

5.1 Introduction

This chapter includes a summary of the study, conclusions, recommendations reached after the study was complete. This chapter also outlines recommendations for additional research.

5.2 Summary of the study

Digitalization is influenced by acceptance to work in an electronic environment and their participation in the creation of such environment. The objective of this was to assess the influence of organizational digital readiness on digitalization of secondary schools in Kipipiri sub county, Nyandarua county, Kenya. Objectives included: The study's dependent variable was the digitalization of secondary schools. variables under this objective were: KCSE school results, digital competent educators, ICT clubs, champions and badges, empowered, competent and lifelong learners, networking and professional learning communities and continuous professional development (CPD) and community of practice. The composite mean for all the constructs was 3.81 with a standard deviation of 0.708 implying that majority of the respondents do agree that there were efforts to digitize secondary schools and that the digitalization efforts have significant impact on the schools.

Governance establishes roles, decision making, accountability which ensures digitalization initiatives of an organization are aligned with her goals and objectives, which are executed

effectively and efficiently. Governance readiness affects the Digitalization of secondary schools. For all factors, the study's composite mean was 3.84, with a standard deviation of 0.694. This indicates that governance readiness was adequate and this helped boost the digitalization of secondary schools. Additionally, a correlation of 0.700 showed a strong association between governance readiness and the digitalization of secondary schools. The significance p-value in the correlation table, which was less than 0.05, showed that there was a statistically significant link between these variables. The null hypothesis was thus rejected.

Reliance on internet and digital networks brings risks such as stealing identity, commit fraud and embarrassing. Digital information security is of paramount concern. Security training on digital security tools is a critical support that leaders must provide. The study examined how security and support readiness of the school affects the digitalization of secondary schools. The participants were not quite certain of the impact of the school's security and support preparedness on the digitalization of secondary schools, as seen by the average score for all the means of 2.72. This objective showed a 0.632 significant positive correlation. Since the p-value for this correlation was less than 0.05 and is statistically significant at 0.001.

The effectiveness of a teachers' professional activity depends not only subject matter knowledge but also knowledge on modern digital tools. Educators must have wide range of skills which will come handy in solving digital reality problems such as decision making in multitasking environment. This requires them to be critical thinkers and innovators. Not all teachers and students are ready for digital transformation without having experience with digital technologies and competency. The total composite mean for every dimension in this survey was 3.13, which suggests that participants generally unsure of how competent school administrators are with regard

to the topic of school digitalization. A correlation of 0.774 was also discovered, demonstrating a substantial and favorable connection between competence development and the digitalization of secondary schools. The correlation table revealed a statistically significant relationship between competence development and secondary school digitalization, with a significance p-value of 0.001.

Though technology is increasingly investigated in order to bridge gaps in formal learning, digital tools such as E readers, smartphones and tablets are used to maintain access to learning material ensuring continuity of learning. Final goal analyzed how technological readiness influenced digitalization of secondary schools. The overall mean for the study was 2.44 which implies that most participants disagreed that schools were technological ready for digitalization. A correlation of 0.677 was discovered. This demonstrates a clear link between technological readiness and the digitalization of secondary schools. The relationship was positive.

5.3 Conclusion

The researcher investigated the effects of the independent factors, such as governance readiness, school security and support readiness, competency preparation, and technical readiness, on secondary school digitalization. According to the results, all of the independent factors had a significant impact on secondary schools' digitalization. Competency ready had the greatest correlation of 0.744 out of all the factors, which were all positively correlated.

The study concludes that governance preparation has a big impact on secondary schools' digitalization. All of the questionnaire's constructs were accepted by the participants. The majority of educational communication, according to 36.6% of respondents, is conducted digitally.

Similarly, 39.3% of respondents concurred that ICT use in studying and other school activities is a passion shared by both students and teachers. The findings suggest that clear rules, governance preparedness, and schools' access to ICT training and resources are crucial for enabling a seamless adoption of ICT in schools.

The study also discovered that secondary schools' preparation for security and support had a big influence on the process of digitizing schools. The research discovered that school administrations had implemented ICT policies and plans. However, the majority of responders felt the use of ICT materials in schools was not well coordinated, they also disagreed that school's ICT materials are well protected. Furthermore, majority of respondents felt that school administrations failed to promote a culture shift in the acceptance and usage of ICT in the classroom.

Additionally, the study draws the conclusion that competence preparation has a significant influence on secondary schools' digital transformation. According to the research, school administrators quickly adopt new ICT systems and prod others to follow suit. The use of ICT in instructional learning and teaching is included in training for school teachers. Participants, however, disputed that school administrators were competent and proficient in using ICT.

Finally, the study discovered that the secondary school's digitalization is significantly influenced by technological readiness. However, respondents disagreed with all the constructs in the questionnaire. For instance, they disagreed that schools had adequate ICT infrastructure, they also felt that schools lacked the necessary hardware tools. Schools also lacked the necessary software applications for use in teaching and learning.

5.4 Recommendations

1. School administrations should provide teachers and staff with frequent and pertinent opportunities for professional development. Assist them in gaining the pedagogical expertise and ICT skills they need to successfully incorporate technology into their teaching methods. Maintaining continuing professional development through the use of a community of practice to share expertise can help you stay up with how quickly technology is developing.

2. To ensure security of ICT tools in the schools, schools should install and configure robust firewall and antivirus solutions to protect the school's network and systems from external threats. Keep these solutions up to date with the latest security patches and definitions. Regularly scan systems for malware and other malicious software.

3. Administrations should also actively incorporate technology into teaching and learning processes. Encourage teachers to explore innovative instructional strategies that leverage ICT tools and resources, develop their digital strategies plan that meet their needs.

4. Schools should conduct a thorough assessment of the school's technological infrastructure, including hardware, software, networking, and connectivity. Identify any gaps or limitations and develop a plan to upgrade or enhance the infrastructure to meet the requirements of ICT integration.

5.5 Recommendations for further studies

Another study can be conducted to examine the effectiveness of different professional

development models and approaches in building teachers' ICT competencies and their ability to integrate technology into their instructional practices. Explore the factors (gender digital inequalities) that support or hinder successful professional development initiatives in this area.

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APPENDIX I: INTRODUCTION LETTER

RODGERS WANYITWA,

P.O BOX 2066-30200,

KITALE.

Dear Participant,

RE: **Request to participate in Research.**

I am taking a master's degree in educational administration at the UoN. Please consider contributing by giving pertinent information to the study titled "Influence of Organizations Digital Readiness on Digitalization of Secondary Schools in Kipipiri Sub County." I will maintain the confidentiality and anonymity of the data you supply.

Looking forward to your cooperation.

Thank you in advance.

Yours sincerely,

RODGERS WANYITWA

E55/37321/2020

APPENDIX II: QUESTIONNAIRE

PART A: GENERAL INFORMATION

Introduction

In Kenya's Kipipiri sub-county of Nyandarua, this study aims to determine the impact of organizational digital readiness on the digitalization of secondary schools. Your comments will be very helpful to the study if you can answer the questions as truthfully as correctly as you can.

1. **How many years have you been in this institution?**

   1-3 years　　(　)

   3-5 years　　(　)

   5-8 years　　(　)

   Over 8

   years　　　　(　)

2. **Kindly indicate your highest level of education attained.**

   PhD (　)

   Postgraduate　(　)

   Graduate　　(　)

   Diploma (　)

3. **What is your school category?**

   National ( ) Extra county ( ) County ( ) Sub county ( )

   4. Gender? Male [ ]　　Female []

PART B: DIGITALIZATION OF SECONDARY SCHOOLS

Use one of the following scores to indicate how much you agree with the following statements on the amount of digitalization and ICT use at your school:

Scale: Strongly Disagreement indicated by 1 and strongly agree by 5

	Statement	1	2	3	4	5
	Governance readiness					
(a)	The majority of educational communication is done digitally.					
(b)	The majority of school stakeholders are encouraged by the usage of ICT in many school functions.					
(c)	The use of ICT in education and other school activities is something that both students and teachers are excited about.					
(d)	The administration firmly supports digitalization in our school by providing the required tools and resources.					

	Statement	5	4	3	2	1
	Security and support readiness					

		5	4	3	2	1
(a)	The use of ICT materials in the school is well-coordinated.					
(b).	The school's ICT materials are well protected.					
(c)	The management of the school encourages a change in the way that ICT is seen and used in the classroom..					
(d).	The school administration has implemented ICT policies and plans.					

	Statement	5	4	3	2	1
	Competency readiness					
(a)	Our principal is quick to integrate new ICT technology and encourages others to do the same.					
(b).	The school principal is capable of learning new ICT technologies and disseminating the information to the rest of the school.					
(c)	The school principal is knowledgeable and skilled in the use of ICT.					
(d).	Teachers in schools receive training on the use of ICT for classroom education.					

	Statement	5	4	3	2	1
	Technological readiness					
(a)	Our school has adequate ICT infrastructure in place					
(b).	There is a variety of hardware available for use in educational programs.					
(c)	School digital hardware have the necessary software for their operation					
(d).	The school provides adequate ICT instruction and assessment of students.					

	Statement	5	4	3	2	1
	Digitalization					
(a)	Digitalization has a positive impact on KCSE school results					
(b).	Digitalization has resulted in an adequate number of digitally skilled educators.					
(c)	As a result of school digitalization, there exist ICT clubs.					
(d).	Digitalization has resulted in empowered and ICT-savvy students in the classroom.					

(e)	Digitalization has made it simple to connect with other schools in the neighborhood.					

APPENDIX III: INTERVIEW GUIDE FOR PRINCIPALS

1. In your view, what do you understand about the term digital transformation?

2. How far has your organization progressed in terms of successful digital transformation? What elements contributed significantly to the success of the digital transformation?

3. What are some of the steps you've taken to improve the digital transformation of school activities?

4. What are some of the digital tools available at your institution? Do you believe these are sufficient to meet the school's demand?

5. Are your computer literate? To what extent? Do you encourage your staff to use ICT in instructional teaching?
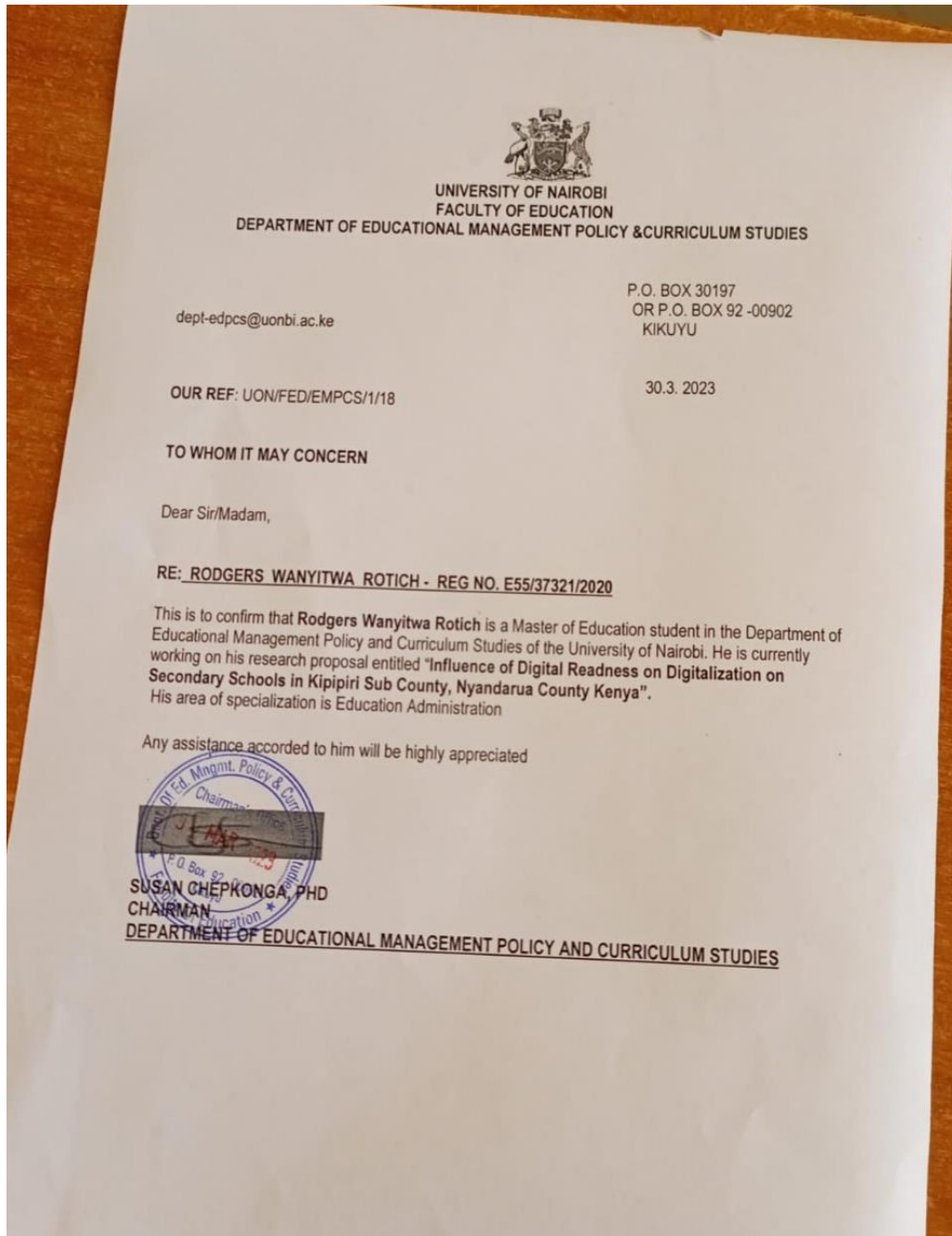
6. How prepared are your students and staff to accept digitalization in your institution?

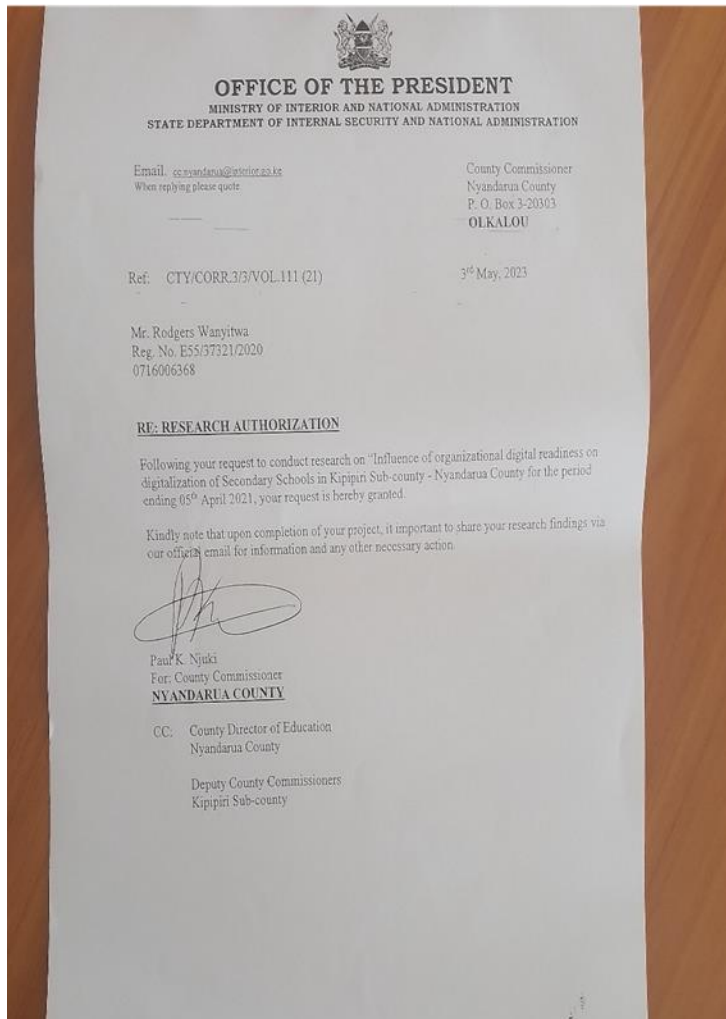7. Do you have adequate funds to support digitalization at your school?

8. Did your school engage in Online learning during COVID-19 Lockdown?

If yes, highlight Potential challenges and risks faced.

APPENDIX IV: AUTHORIZATION LETTER FROM DEPARTMENT

UNIVERSITY OF NAIROBI
FACULTY OF EDUCATION
DEPARTMENT OF EDUCATIONAL MANAGEMENT POLICY &CURRICULUM STUDIES

dept-edpcs@uonbi.ac.ke

P.O. BOX 30197
OR P.O. BOX 92 -00902
KIKUYU

OUR REF: UON/FED/EMPCS/1/18

30.3. 2023

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: RODGERS WANYITWA ROTICH - REG NO. E55/37321/2020

This is to confirm that **Rodgers Wanyitwa Rotich** is a Master of Education student in the Department of Educational Management Policy and Curriculum Studies of the University of Nairobi. He is currently working on his research proposal entitled "**Influence of Digital Readness on Digitalization on Secondary Schools in Kipipiri Sub County, Nyandarua County Kenya**".
His area of specialization is Education Administration

Any assistance accorded to him will be highly appreciated

SUSAN CHEPKONGA, PHD
CHAIRMAN
DEPARTMENT OF EDUCATIONAL MANAGEMENT POLICY AND CURRICULUM STUDIES

APPENDIX V: LETTER FROM COUNTY COMMISSIONER

OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND NATIONAL ADMINISTRATION
STATE DEPARTMENT OF INTERNAL SECURITY AND NATIONAL ADMINISTRATION

Email. cc.nyandarua@interior.go.ke
When replying please quote.

County Commissioner
Nyandarua County
P. O. Box 3-20303
OLKALOU

Ref: CTY/CORR.3/3/VOL.111 (21)   3rd May, 2023

Mr. Rodgers Wanyitwa
Reg. No. E55/37321/2020
0716006368

RE: RESEARCH AUTHORIZATION

Following your request to conduct research on "Influence of organizational digital readiness on digitalization of Secondary Schools in Kipipiri Sub-county - Nyandarua County for the period ending 05th April 2021, your request is hereby granted.

Kindly note that upon completion of your project, it important to share your research findings via our official email for information and any other necessary action.

Paul K. Njuki
For: County Commissioner
NYANDARUA COUNTY

CC: County Director of Education
       Nyandarua County

       Deputy County Commissioners
       Kipipiri Sub-county

APPENDIX VI: RESEARCH PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **937799**

Date of Issue: **05/April/2023**

RESEARCH LICENSE

This is to Certify that Mr.. **Rodgers Wanyitwa Rotich** of University of Nairobi, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nyandarua on the topic: **Influence of organizational digital readiness on digitalization of Secondary schools in Kipipiri Subcounty,Nyandarua County Kenya. for the period ending : 05/April/2024.**

License No: **NACOSTI/P/23/25036**

937799

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document,
Scan the QR Code using QR scanner application.

See overleaf for conditions

81

APPENDIX VII: TURNITIN REPORT

INFLUENCE OF ORGANIZATIONAL DIGITAL MATURITY ON DIGITALIZATION OF SECONDARY SCHOOLS IN KIPIPIRI SUB COUNTY, NYANDARUA COUNTY, KENYA.