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Influence of Digital Transformation on Learning in Public Service Training Institutions

Kimeli M. Chirchir¹, Cheruiyot Eddah², Richard Siree*, Daniel Kimutai*, Lekeesio Samuel*, Everline Makori*, Epuu Joseph Elim*, Napua Shadrack*, Nicholas Chelimo*, Kenneth C. Muskiton*

¹Kenya School of Government

²Kenya School of Government

*Senior Management Course No. 194 Participants, KSG Baringo

ABSTRACT- The purpose of the study was to assess the influence of digital transformation on learning in public service training institutions taking a case study of Kenya School of Government, Baringo Campus. The Objectives of the study were; to assess the current state of digital transformation; examine the influence of digital transformation on the quality of learning and teaching and identify the challenges faced in implementing digital transformation. The study employed a descriptive research design anchored on Technology Acceptance Model, and Diffusion of Innovations Theory. Study's target sampling frame was KSG Baringo SMC and SLDP students. The study targeted all 53 respondents undertaking their studies during the study. Stratified random sampling method was used. Data was collected using questionnaires. The findings from the study revealed mixed perceptions on digital transformation at the Kenya School of Government (KSG) Baringo Campus, with respondents generally acknowledging progress while also highlighting areas for improvement. Although over half of the respondents viewed the digital infrastructure positively and recognized digital transformation as a strategic priority, a significant minority expressed concerns about the reliability and modernity of the infrastructure. Disparities in access to digital tools and the effectiveness of strategic communication across the institution were also noted. While a majority of respondents believed that staff and students were adequately trained and that the administration was proactive in maintaining digital systems, a notable portion indicated the need for better training programs. On learning and teaching, most respondents agreed digital tools had influenced the quality of teaching, student engagement, and learning outcomes, including improvements in critical thinking, problem-solving, and collaboration among students. However, there were still concerns regarding the consistent use and effectiveness of these tools, with financial constraints, resistance to change, and inadequate technical support identified as barriers to successful digital transformation. These challenges underscore the need for continued efforts to enhance the digital learning environment and ensure the benefits of digital transformation are fully realized across the campus. The findings provide valuable data that can inform policy and practice in public institutions across Kenya.

Keywords: Digital Transformation, Learning, Public Service, Training Institutions

I. INTRODUCTION

1.1 Background of the Study

Digital transformation has become a crucial aspect of modern education in the world, reshaping how institutions operate, deliver content, and engage with learners. Public institutions, including government training facilities, are increasingly adopting digital tools to enhance learning outcomes, increase accessibility, and improve administrative efficiency. In the USA, digital transformation in education has been driven by the need to cater to diverse learning needs and enhance accessibility. Institutions have increasingly adopted online learning platforms, virtual classrooms, and digital resources to provide flexible and inclusive education. For instance, the use of Learning Management Systems (LMS) such as Blackboard and Canvas has become widespread, enabling institutions to offer blended and fully online courses. A study by the Pew Research Center (2021) highlights that over 70% of U.S. institutions have integrated digital tools into their curricula, significantly improving learner engagement and outcomes.

Similarly, in Canada, digital transformation has been a key focus, especially during the COVID-19 pandemic. The government and educational institutions have invested heavily in digital infrastructure to support remote learning. The Canadian Digital Learning Research Association (2022) reports that the majority of post-secondary institutions in Canada have implemented comprehensive digital strategies to enhance learning experiences. This has included the integration of Artificial Intelligence (AI) in personalized learning and the use of data analytics to track student performance.

Finland, renowned for its high-quality education system, has also embraced digital transformation. The Finnish National Agency for Education (2021) emphasizes that digital tools are not only used for delivering content but also for encouraging creativity, collaboration, and critical thinking among students. Finland's approach to digital education is holistic, integrating digital literacy across the curriculum and ensuring that both students and educators are proficient in using technology. In South Africa, digital transformation in education has been marked by both progress and challenges. While there is significant adoption of digital tools in urban areas, rural regions continue to face infrastructural barriers. However, initiatives like the National Education Collaboration Trust (NECT) have been instrumental in bridging this gap by providing digital resources and training to educators in under-resourced areas. The South African Department of Basic Education (2023) notes that there has been a 50% increase in the use of digital learning platforms in public schools since 2020.

Rwanda and Tanzania provide interesting case studies for digital transformation in education within East Africa. Rwanda has been a regional leader in integrating ICT into education, with the government's Vision 2020 plan emphasizing the use of digital technologies to improve education quality. The Ministry of Education (2022) in Rwanda reports that over 60% of secondary schools have access to digital tools, and there has been a concerted effort to train teachers in digital literacy. In Tanzania, digital transformation has been slower but is gaining momentum, especially in urban centers. The Tanzania Commission for Universities (TCU, 2023) has been working on integrating digital learning tools into higher education institutions, though challenges such as internet connectivity and digital literacy persist. However, initiatives like the National ICT Broadband Backbone (NICTBB) are expected to improve digital access across the country, thereby enhancing the potential for digital learning.

Kenya has made significant strides in integrating digital technology into its education sector. The Kenya Vision 2030 initiative underscores the importance of ICT in education, and various policies have been implemented to promote digital literacy. The Kenya School of Government, Baringo Campus, has not been left behind in this transformation. Like many other

institutions, KSG has embarked on a journey to integrate digital technologies into its educational framework. As part of the government's broader strategy to enhance public service delivery through training, KSG has adopted various digital tools aimed at improving the quality of training and learning outcomes. However, the integration of digital technology in Kenyan public institutions faces several challenges, including limited infrastructure, inadequate training for educators, and disparities in access to technology between urban and rural areas. A study by the Kenya Institute of Curriculum Development (KICD, 2023) highlights that while digital tools are increasingly being used in public institutions, there is still a need for comprehensive strategies to ensure their effective implementation. Therefore, digital transformation is critical for the Kenya School of Government (KSG), particularly the Baringo Campus, which plays a vital role in training civil servants and public sector leaders. This study therefore sought to assess the influence of digital transformation on learning at the Baringo Campus, evaluating both opportunities and challenges.

1.2 Statement of the Problem

The rapid advancement of digital technologies has necessitated a transformation in educational practices worldwide. Public institutions, which have traditionally relied on conventional methods of teaching and learning, are increasingly being urged to adopt digital tools to enhance educational outcomes, improve accessibility, and meet the evolving needs of learners (Means et al., 2010; Garrison & Kanuka, 2004). However, the integration of digital technologies in public institutions, particularly in developing countries like Kenya, presents significant challenges. These include inadequate digital infrastructure, limited digital literacy among educators and students, disparities in access to technology between urban and rural areas, and insufficient policy frameworks to support digital learning (Mwangangi et al., 2020; Ouma et al., 2013).

At the Kenya School of Government (KSG), Baringo Campus, these challenges are particularly pronounced. While there have been efforts to integrate digital tools into the institution's educational framework, the extent to which these tools have impacted learning outcomes remains unclear. Additionally, there is a lack of comprehensive data on the specific barriers faced by the institution in its digital transformation journey, as well as the effectiveness of current strategies in addressing these challenges. This study is therefore motivated by the need to critically assess the influence of digital transformation on learning at the Kenya School of Government, Baringo Campus. It seeks to identify the key challenges and opportunities associated with this transformation, evaluate the effectiveness of digital tools currently in use, and provide insights that could inform future strategies for enhancing digital learning in public institutions.

In Kenya, the public service sector is a significant part of the governance structure, employing approximately 350,000 public servants (KNBS, 2023) across national and county governments, of which some have been drawn from the private sector, non-state actors, civil society, media and faith-based organisation, most of who they have never been inducted in government operations.

Despite the large workforce, there is a pressing issue regarding the adequacy and impact of the training and development provided to these employees. The shift towards digital tools in training raises questions about the effectiveness of these tools, the challenges faced in their implementation, and the opportunities they present for improving learning outcomes. Understanding the influence of digital transformation on learning within public institutions is crucial for developing strategies to enhance digital learning and improve the quality of education and public service delivery. Given the importance of public institutions in training government personnel and shaping public policy, understanding the influence of digital transformation on

learning in such settings is crucial for improving the quality of education and public service delivery in Kenya.

1.3 Objectives of the study

The main objective of the study was to assess the influence of digital transformation on learning in public service training institutions: a case of Kenya School of Government, Baringo Campus.

1.4 Specific objectives

1. To assess how digital tools and resources influence the learning experience at the Kenya School of Government Baringo Campus.
2. To investigate how the availability and quality of digital infrastructure and support systems affect learning at the Kenya School of Government Baringo Campus.
3. To explore how training and digital literacy among students contribute to the effectiveness of learning at the Kenya School of Government Baringo Campus.

1.5 Research questions

1. How do digital tools and resources impact learning at the Kenya School of Government Baringo Campus?
2. How does the infrastructure and support provide influence learning outcomes at the Kenya School of Government Baringo Campus?
3. How do training and digital literacy levels affect learning at the Kenya School of Government Baringo Campus?

1.6 Justification of the Study

The study on the digital transformation of learning at the Kenya School of Government (KSG) Baringo Campus is justified by several compelling reasons that highlight its importance and relevance. As digital technologies rapidly evolve, there is an urgent need to understand their impact on educational practices, particularly within public institutions like KSG. This study is essential for identifying how well digital tools and platforms are integrated into the learning environment, ensuring that the institution keeps pace with global educational trends.

Given KSG's critical role in training government personnel, there is a need to evaluate the effectiveness of digital transformation initiatives in enhancing the quality of these programs. Understanding how digital tools affect learning outcomes will help optimize training methods, ensuring that public servants are well-equipped to meet the demands of their roles.

In many developing regions, including rural Kenya, institutions face significant challenges in implementing digital technologies due to limited resources and infrastructure. This study is needed to identify these barriers at KSG Baringo Campus and to explore practical solutions that can make digital transformation more feasible and impactful in resource-constrained environments.

There is a critical need to ensure that digital transformation efforts are inclusive, particularly for students with disabilities. The study will examine the extent to which digital initiatives are accessible to all learners, helping to create an educational environment that supports diverse needs and promotes equity.

As digital initiatives require substantial investments, there is a need for empirical evidence to assess their effectiveness. This study will generate valuable data on the outcomes of digital transformation efforts at KSG, providing a foundation for informed decision-making and future strategic planning. The findings from this study will offer insights that can be applied beyond KSG Baringo Campus, serving as a benchmark for other public institutions in Kenya and

similar contexts. There is a need for case studies that can guide other institutions in navigating the challenges and opportunities of digital transformation.

There is a need to support national development objectives, such as Kenya's Vision 2030, and global targets like the Sustainable Development Goals (SDGs). By focusing on digital transformation in education, this study contributes to achieving these broader goals, ensuring that public institutions play a role in advancing inclusive and equitable education.

1.7 Significance of the Study

This study is envisaged to provide various benefits; by evaluating the impact of digital tools, infrastructure, and digital literacy, this study provides insights into how these elements contribute to improved learning outcomes. The findings can help KSG optimize its digital transformation strategies to enhance the quality of education and better prepare public servants for their roles.

The study offers empirical evidence that can inform policy-making and strategic decisions at KSG and other similar institutions. The insights gained will guide the development and implementation of digital education policies that are responsive to the needs of both educators and learners, particularly in resource-constrained environments.

By improving the quality of training for public servants through effective digital transformation, the study contributes to the overall efficiency of public administration and service delivery in Kenya. Well-trained public servants are crucial for the successful implementation of government policies and the delivery of essential services to citizens.

The study identifies and explores the challenges faced in implementing digital transformation, such as limited infrastructure, financial constraints, and gaps in digital literacy. By highlighting these issues, the study provides a foundation for developing targeted solutions that can overcome these barriers and ensure that digital transformation initiatives are sustainable and effective.

The study's focus on inclusivity, particularly for people living with disabilities, ensures that digital transformation efforts at KSG are accessible to all learners. This emphasis on inclusivity aligns with broader educational goals of providing equitable learning opportunities and creating an enabling environment for all students.

The findings from this study can serve as a valuable case study for other public institutions in Kenya and similar contexts. The lessons learned and best practices identified can be replicated across other campuses of KSG and other public institutions, thereby contributing to a more comprehensive understanding of digital transformation in education.

Alignment with National and Global Educational Goals: The study supports Kenya's Vision 2030 and the United Nations Sustainable Development Goals (SDGs), particularly Goal 4, which focuses on ensuring inclusive and equitable quality education. By contributing to the achievement of these goals, the study has a broader significance beyond KSG, impacting the national and global education agenda.

This study provides a robust empirical foundation for future research on digital transformation in education. The data and insights generated can be used as a reference for subsequent studies, helping to build a more comprehensive body of knowledge on the subject.

1.8 Scope of the Study

The scope of the study is defined by several key parameters that guide the research and analysis. This study focused on the digital transformation at the Kenya School of Government (KSG) Baringo Campus, examining its influence on learning and teaching within this specific public institution. Firstly, the study assessed the current state of digital transformation at KSG Baringo Campus, including the adoption and utilization of digital tools, technologies, and platforms within the institution. This includes examining the extent to which digital resources such as Learning Management Systems (LMS), online learning platforms, and digital content are

integrated into the institution's educational framework. Secondly, the study investigated the influence of digital transformation on the quality of learning and teaching at KSG Baringo Campus. This includes evaluating how digital tools have influenced teaching methodologies, student engagement, learning outcomes, and overall educational experiences. The study focused on both the positive outcomes and any potential challenges or limitations that have emerged as a result of integrating digital technologies into the learning environment.

Thirdly, the study identified the challenges faced in implementing digital transformation at KSG Baringo Campus. These challenges may include infrastructural limitations, digital literacy gaps among staff and students, resistance to change, and disparities in access to digital resources. By understanding these obstacles, the study aims to provide a comprehensive analysis of the barriers that hinder the effective implementation of digital technologies in public institutions.

The study drew on best practices from similar institutions in other countries to inform these recommendations. Geographically, the study is limited to the Kenya School of Government, Baringo Campus, and does not extend to other campuses or public institutions in Kenya. However, the findings and insights generated from this study may be applicable to similar institutions within the country and in other developing contexts. Temporally, the study considered the period during which digital transformation efforts have been actively pursued at KSG Baringo Campus, with a focus on recent developments and the current state of digital integration.

1.9 Limitations of the Study

While this study aimed to provide a comprehensive assessment of digital transformation at the Kenya School of Government (KSG) Baringo Campus, several limitations were acknowledged to affect the scope and generalizability of the findings. Firstly, the study was geographically limited to KSG Baringo Campus and does not extend to other campuses of the Kenya School of Government or other public institutions in Kenya. This narrow focus would limit the applicability of the findings to other contexts, as different institutions may face unique challenges and opportunities in their digital transformation efforts. The findings, therefore, may not fully represent the broader state of digital transformation across all public institutions in the country.

Secondly, the study relied on data collected from a specific period, focusing on the current state of digital transformation and recent developments at KSG Baringo Campus. As digital transformation is an ongoing process, the study may not capture the full evolution of digital integration or future changes that may occur after the data collection period. This temporal limitation means that the study provides a snapshot of the current situation rather than a long-term analysis. Thirdly, the study may have been constrained by the availability and reliability of data. Digital transformation involves multiple facets, including technology infrastructure, user engagement, and policy frameworks. Access to accurate and comprehensive data on these aspects may be limited, particularly if institutional records are incomplete or if there are gaps in the documentation of digital initiatives. Additionally, the study may rely on self-reported data from educators, students, and administrators, which could introduce bias or inaccuracies.

Another limitation is the potential for variability in digital literacy and technology adoption among staff and students. Differences in digital literacy levels could affect the study's findings on the influence of digital transformation, as individuals with varying levels of proficiency may experience and report the use of digital tools differently. This variability might limit the study's ability to draw uniform conclusions about the effectiveness of digital transformation initiatives. Furthermore, the study would be faced with challenges related to the rapidly changing nature of digital technologies. As new tools and platforms emerge, the

relevance and applicability of the study's findings may diminish over time. The fast-paced evolution of digital technologies could mean that some of the tools and practices examined in the study may become outdated or replaced by newer innovations shortly after the study is completed. Lastly, the study may not fully account for external factors that influence digital transformation, such as national policies, funding constraints, or broader socio-economic conditions. These factors could significantly influence the success of digital transformation initiatives but may fall outside the scope of the study's analysis.

II. REVIEW OF RELATED STUDIES

2.1 Theoretical Review

This study was guided by Technology Acceptance Model (TAM), by Davis, (1989) and Diffusion of Innovations Theory, developed by Everett Rogers in (1962).

2.1.1 Technology Acceptance Model (TAM),

The Technology Acceptance Model (TAM), developed by Davis in 1989, is a widely used framework for understanding how users come to accept and use technology. TAM postulates that two primary factors influence an individual's decision to adopt a new technology: perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness refers to the degree to which a person believes that using a particular technology will enhance their job performance, while perceived ease of use refers to the extent to which someone believes that utilising the technology will be free from effort. These factors, in turn, influence the user's attitude towards using the technology, which then affects their behavioural intention to use it, ultimately determining actual usage.

In the context of this study, assessing the influence of digital transformation on learning outcomes at the Kenya School of Government, Baringo Campus, TAM can be applied to understand how educators and students accept and utilize digital tools and resources. The perceived usefulness of digital tools in enhancing academic performance, knowledge retention, and skill development is crucial. If students and educators believe that digital resources will improve learning outcomes, they are more likely to adopt and use these technologies. For instance, the use of online learning platforms, interactive software, and digital libraries must be seen as beneficial for learning enhancement.

Similarly, perceived ease of use is essential in this context. If the digital tools and resources provided are user-friendly and do not require significant effort to learn and use, both students and educators are more likely to integrate them into their daily routines. This ease of use is influenced by the availability of proper training and digital literacy programs, which equip users with the necessary skills to navigate and utilize these technologies effectively.

The application of TAM in this study aligns with previous research in the field of educational technology. For example, a study by Teo (2011) on the use of technology in teaching and learning found that both perceived usefulness and perceived ease of use significantly influenced teachers' attitudes towards technology adoption. Another study by Venkatesh and Bala (2008) expanded TAM to include additional factors such as social influence and facilitating conditions, which also play a role in technology acceptance. In the case of the Kenya School of Government, Baringo Campus, social influence from peers and superiors, along with the availability of robust infrastructure and support, could further improve the accommodation and proper use of digital tools.

Moreover, empirical studies have shown that the successful implementation of digital transformation in education often hinges on addressing both perceived usefulness and perceived ease of use; e.g. a study by Sánchez-Prieto et al. (2017) on mobile learning acceptance highlighted that when students find mobile learning tools useful and easy to use, their

engagement and learning outcomes improve. Similarly, a study by Ifenthaler and Schweinbenz (2016) on digital literacy training emphasized that enhancing both the perceived usefulness and ease of use of digital tools among educators led to higher adoption rates and better learning experiences for students.

2.1.2 The Diffusion of Innovations Theory

The Diffusion of Innovations Theory, developed by Everett Rogers in 1962, provides a relevant theoretical framework for understanding the study on the influence of digital transformation on learning in the public institution, the Kenya School of Government (KSG) Baringo Campus. At the core of the Diffusion of Innovations Theory are four key elements: innovation, communication channels, time, and the social system. The theory posits that the rate of adoption of an innovation is influenced by five key characteristics: relative advantage, compatibility, complexity, trialability, and observability. These characteristics determine how quickly an innovation is adopted within a social system. Building on Rogers' work, other researchers have introduced additional factors that influence the adoption of innovations. For instance, Moore and Benbasat (1991) proposed the "Perceived Characteristics of Innovating," which includes factors such as image, voluntariness of use, and result demonstrability. In the context of the KSG Baringo Campus study, the Diffusion of Innovations Theory can be applied in the following ways:

Innovation: The digital transformation initiatives and technologies being implemented at the institution, such as the integration of learning management systems, digital content, and other digital tools, can be considered the innovations under investigation.

Communication Channels: The various means through which information about the digital transformation is being shared with and among the staff and students, such as training sessions, workshops, and institutional communications, are the communication channels that can influence the diffusion of the innovations.

Time: The pace and stages of the digital transformation process, including the time it takes for the staff and students to adopt and incorporate the new digital technologies into their training delivery practices, are critical elements in comprehending the diffusion of the innovations.

Social System: The organizational and social dynamics within the KSG Baringo Campus, including the attitudes, beliefs, and behaviours of the staff and students towards the adoption and use of digital technologies, represent the social system that can either facilitate or hinder the diffusion of the innovations. By applying the Diffusion of Innovations Theory, the researchers can gain valuable insights into the factors that influence the adoption and implementation of digital transformation at the KSG Baringo Campus. This theory can provide a framework for understanding the challenges, facilitators, and strategies for enhancing digital transformation to improve learning outcomes in the institution.

For instance, the study could examine the relative advantage of the digital technologies being implemented, their compatibility with the existing teaching and learning practices, the perceived complexity of using the new technologies, the opportunities for trialling the innovations, and the observability of the benefits of digital transformation. Additionally, the researchers could explore the influence of factors like image, voluntariness of use, and result demonstrability on the diffusion of the digital innovations within the institution. Therefore, the Diffusion of Innovations Theory offers a robust and well-established theoretical foundation for analyzing the adoption and implementation of digital transformation in the context of the KSG Baringo Campus study. In leveraging this theory, the researchers can generate valuable data that can inform policy and practice in public institutions across Kenya as they navigate the challenges and opportunities of digital transformation in education.

2.2 Conceptual Framework

This study was anchored on a conceptual framework. Figure 1.1 shows the conceptual framework.

Independent variables

Dependent Variable

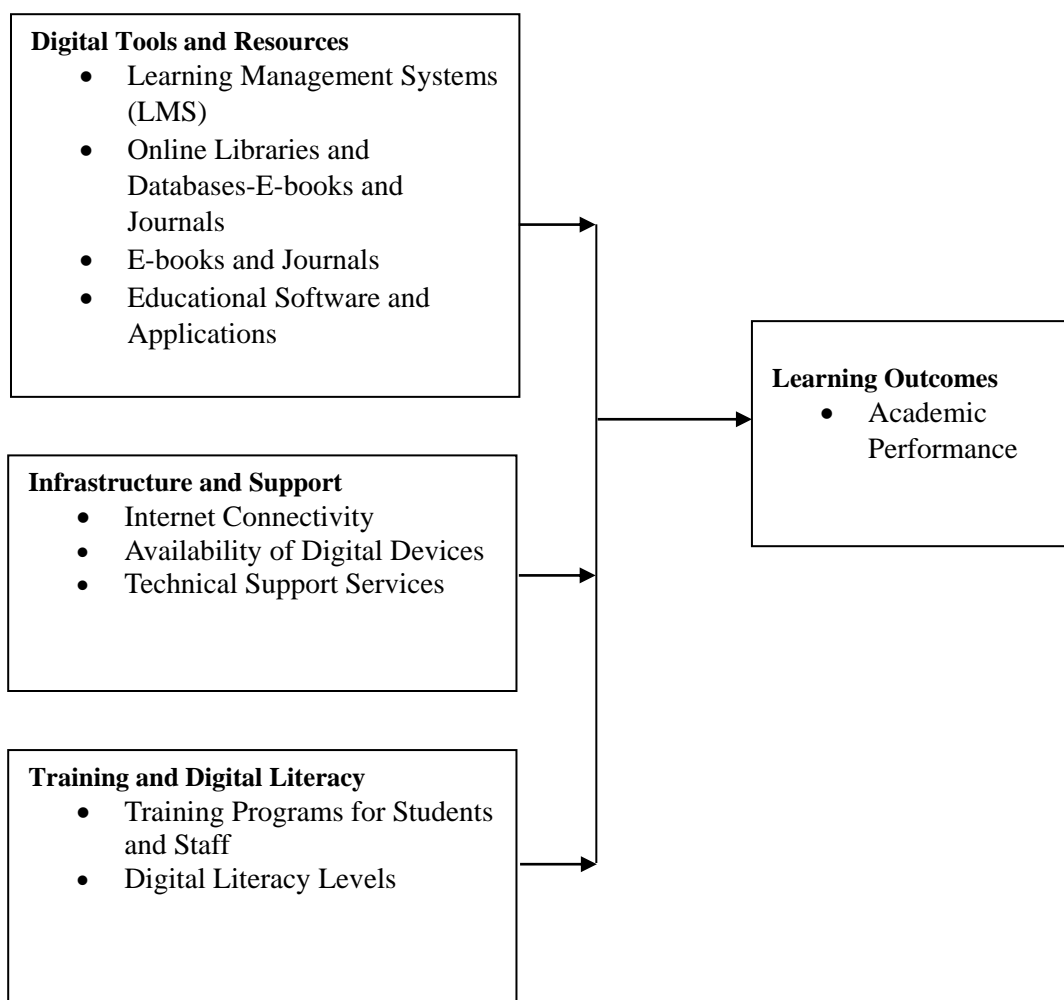


Figure 1.1 Conceptual Framework (Source: Researcher's, 2024)

In this study the conceptual framework involves a detailed examination of how various independent variables impact learning outcomes. In this context, the independent variables include digital tools and resources, infrastructure and support, and training and digital literacy. These variables are expected to directly affect the dependent variable, which encompasses learning outcomes such as academic performance, knowledge retention, and skill development. Digital tools and resources form a critical component of the digital transformation in learning environments. These tools include hardware such as computers, tablets, and interactive whiteboards, as well as software like educational applications and online learning platforms. The availability and effective utilization of these digital tools can enhance the learning experience by providing students with diverse and interactive learning materials, facilitating access to information, and enabling more personalized learning experiences. For instance, the integration of e-books, online journals, and multimedia resources can cater to different learning styles, thus improving academic performance and knowledge retention.

Infrastructure and support are equally vital in ensuring the success of digital transformation in learning institutions. This encompasses the availability of robust internet

connectivity, reliable power supply, and technical support services. Adequate infrastructure ensures that digital tools and resources can be effectively utilized without interruptions, thereby maintaining a conducive learning environment. Support services, including IT help desks and maintenance teams, are essential in addressing technical issues promptly, which helps in minimizing downtime and enhancing the overall learning experience. When infrastructure and support are well-developed, students and educators can focus more on the learning process, which positively influences learning outcomes such as academic performance and skill development. Training and digital literacy are fundamental in empowering both educators and students to effectively use digital tools and resources. Professional development programs for educators that focus on integrating technology into teaching practices are crucial. Such training helps educators develop the necessary skills to create engaging and interactive lessons, thus improving student engagement and learning outcomes. Additionally, fostering digital literacy among students enables them to navigate and utilize digital resources effectively, promoting independent learning and critical thinking. As students become more proficient in using digital tools, their ability to retain knowledge and develop relevant skills for the modern workforce is significantly enhanced.

2.3 Empirical Review

2.3.1 Influence of digital transformation on the quality of learning and teaching

Digital transformation in education refers to the integration of digital technologies into all aspects of the educational process, including teaching methods, learning environments, and administrative functions. It involves the adoption of tools such as Learning Management Systems (LMS), virtual classrooms, digital content, and data analytics to enhance educational outcomes and improve the overall learning experience (Brown, 2022). Theoretically, digital transformation is often associated with the constructivist approach to learning, where technology serves as a tool to create more interactive, student-centered learning environments (Mishra & Koehler, 2006).

Globally, in public institutions, digital transformation includes the adoption of e-learning platforms, digital administration systems, and online communication tools. In Germany, digital transformation in education has been significantly influenced by the "DigitalPakt Schule" initiative, which aims to modernize school infrastructure and integrate digital tools into the classroom. The influence of these efforts has been positive, with studies showing improved student engagement and the ability to personalize learning experiences (Eickelmann & Gerick, 2022). However, challenges such as unequal access to technology and varying levels of digital literacy among teachers remain obstacles to fully realizing the benefits of digital transformation (Schmid et al., 2023).

In the Netherlands, digital education is well-established, with a focus on using technology to foster collaborative learning and critical thinking. Dutch schools have embraced digital tools to enhance the quality of education, leading to better student outcomes and more efficient teaching practices (Voogt et al., 2022). The Dutch government's commitment to digital literacy has also ensured that both teachers and students are well-equipped to utilize technology effectively (Kennisnet, 2023). Australia has been at the forefront of integrating digital technologies in education, particularly in response to the COVID-19 pandemic. The rapid shift to online learning during the pandemic accelerated digital transformation across Australian schools, leading to a more flexible and inclusive education system. Research indicates that digital transformation has improved access to education, particularly in remote areas, and has allowed for more tailored and student-centered learning experiences (Selwyn et al., 2022). However, issues such as the digital divide and the need for ongoing professional development for teachers remain significant challenges (Lamb et al., 2022).

In Nigeria, digital transformation in education is gaining traction, particularly in higher education institutions. The introduction of e-learning platforms and digital resources has been

shown to improve the quality of teaching and learning by providing students with access to a wider range of resources and enabling more interactive learning environments (Ojo et al., 2022). However, the impact is limited by infrastructural challenges, including inconsistent power supply and limited internet connectivity, which hinder the effective use of digital tools in education (Oke & Olatunde, 2023). Ghana has also made strides in digitalizing education, with initiatives such as the Ghana Education Service's deployment of ICT tools in schools. Studies have shown that digital transformation has positively impacted student learning by enhancing access to educational materials and enabling more dynamic teaching methods (Owusu-Ansah & Mwinlaaru, 2023). However, challenges such as inadequate infrastructure and limited digital literacy among educators continue to affect the overall influence of these efforts (Ankomah-Asare et al., 2022).

In Ethiopia, digital transformation in education is still in its nascent stages, with efforts primarily focused on improving access to digital tools and resources in urban areas. The introduction of digital classrooms and online learning platforms has begun to enhance the quality of education by making learning more accessible and flexible (Tilahun et al., 2023). However, the digital divide between urban and rural areas poses a significant challenge, limiting the influence of these initiatives on a national scale (Assefa & Abate, 2022). Uganda has seen increased efforts to integrate digital technologies into its education system, particularly in response to the need for remote learning during the COVID-19 pandemic. Digital transformation has been shown to improve the quality of education by enabling more interactive and student-centered learning experiences (Namukasa et al., 2022). However, the lack of adequate infrastructure and the digital skills gap among educators remain significant barriers to fully realizing the benefits of digital transformation (Kavuma et al., 2023).

In Kenya, digital transformation in education has been driven by initiatives such as the Digital Literacy Programme, which aims to integrate ICT into the primary school curriculum. The influence of digital transformation in Kenyan schools has been mixed, with studies showing improvements in student engagement and access to educational resources, particularly in urban areas (Mutisya & Makokha, 2023). However, challenges such as inadequate infrastructure, particularly in rural areas, and disparities in access to technology continue to hinder the full potential of digital transformation in improving educational quality (Nyangowa et al., 2023).

Furthermore, the Kenya School of Government (KSG) has made efforts to integrate digital tools into its training programs, aiming to enhance the quality of learning for public servants. The influence of these efforts has been positive in terms of improving the accessibility and flexibility of training programs, although challenges such as resistance to change and varying levels of digital literacy among participants persist (Wamuyu, 2023).

2.3.2 Availability and quality of digital infrastructure and support systems

The implementation of digital transformation in teaching and learning has the potential to revolutionize educational practices by enhancing accessibility, engagement, and effectiveness. However, this transformation is fraught with challenges that vary significantly across different contexts. These challenges can impede the successful integration of digital technologies into educational systems and impact the overall effectiveness of digital initiatives. In France, the integration of digital technologies in education has been met with several challenges. Despite significant investments in digital infrastructure and educational technologies, issues such as uneven access to digital resources and varying levels of digital literacy among teachers have persisted. Studies have highlighted that while some schools have successfully integrated digital tools, others struggle due to inadequate training and support for educators (Deschamps & Moreau, 2022). Additionally, there is a notable disparity between urban and rural schools in terms of access to technology, which exacerbates existing educational inequalities (Blanc et al., 2023).

In Brazil, digital transformation in education faces challenges related to infrastructure and socio-economic disparities. The country has made strides in incorporating digital tools into

classrooms, but significant barriers remain, including limited access to reliable internet and technology in under-resourced schools. Research indicates that while urban schools in Brazil may benefit from digital advancements, rural and low-income areas face substantial obstacles, such as inadequate hardware and inconsistent internet connectivity (Oliveira & Silva, 2023). Additionally, there are challenges related to teacher training, with many educators lacking the skills necessary to effectively use digital tools in their teaching practices (Lima et al., 2023).

In Singapore, digital transformation has been relatively successful due to strong government support and robust infrastructure. However, challenges still exist, particularly in ensuring equitable access to digital resources and addressing the digital divide among students. Despite the country's advanced technological environment, there are concerns about the over-reliance on technology and the need for a balanced approach that integrates both digital and traditional teaching methods (Tan & Choo, 2022). Furthermore, the rapid pace of technological change poses a continuous challenge for educators to stay updated and effectively incorporate new tools into their teaching strategies (Ng & Wong, 2023). In Zambia, the implementation of digital transformation in education is hindered by several factors, including limited infrastructure, inadequate funding, and low levels of digital literacy among educators and students. The lack of consistent electricity and internet connectivity in many areas further exacerbates these challenges, making it difficult to sustain digital initiatives (Phiri & Mweemba, 2023). Studies have shown that while there is enthusiasm for digital tools, the lack of infrastructure and support mechanisms severely limits their effective use in teaching and learning (Chileshe & Kunda, 2022).

In Somalia, the challenges of implementing digital transformation in education are compounded by ongoing socio-political instability and limited resources. The education sector in Somalia faces severe infrastructural deficits, including insufficient access to digital technologies and unreliable internet connectivity (Abdi & Ibrahim, 2023). Moreover, the lack of trained personnel and educational materials further hampers efforts to integrate digital tools into the curriculum. Research indicates that while there is potential for digital transformation to improve educational outcomes, the current challenges are significant and require comprehensive solutions (Mohamed & Yusuf, 2022).

In Tanzania, digital transformation in education is confronted with challenges related to infrastructure, digital literacy, and resource allocation. Although there have been efforts to introduce digital technologies in schools, many institutions face difficulties such as inadequate technical support, limited access to devices, and variability in teacher training (Mugisha & Ngalinda, 2023). Additionally, socio-economic disparities impact the equitable distribution of digital resources, with rural and underserved areas experiencing more pronounced challenges compared to urban centres (Mdee et al., 2022).

In Kenya, the implementation of digital transformation in education has encountered various challenges. While the government has made significant investments in digital infrastructure and educational technology through initiatives such as the Digital Literacy Programme, issues such as limited access to technology in rural areas, inadequate teacher training, and resistance to change persist (Nyaboga & Mwakio, 2023). Furthermore, disparities in digital literacy among students and teachers contribute to uneven outcomes, affecting the overall effectiveness of digital tools in enhancing the quality of education (Mwangi & Kamau, 2022).

2.3.3 Strategies for Enhancing Digital Transformation to Improve Learning Outcomes

Digital transformation in education represents a pivotal shift towards leveraging technology to enhance teaching and learning experiences. Effective strategies for improving learning outcomes through digital transformation involve addressing key areas such as infrastructure development, teacher training, and curriculum integration. These strategies often include expanding access to digital tools and resources, implementing comprehensive professional development programs for educators, and integrating technology seamlessly into educational practices. By focusing on these areas, educational systems can better harness the

potential of digital technologies to create more engaging, personalized, and effective learning environments, ultimately bridging gaps and addressing disparities within various educational contexts.

In Malaysia, strategies for enhancing digital transformation in education focus on integrating technology into the curriculum and providing extensive training for educators. The Malaysian Ministry of Education has implemented the "Malaysia Education Blueprint," which emphasizes the use of digital tools to foster interactive and personalized learning environments (Jamaludin & Hassan, 2023). Key strategies include the development of digital content, the enhancement of digital infrastructure, and the provision of professional development programs for teachers to effectively incorporate technology into their teaching practices (Hussain & Zakaria, 2022). The integration of data analytics to monitor and improve student performance is also a critical component of Malaysia's digital transformation strategy (Yusof & Ng, 2023). In Pakistan, enhancing digital transformation in education involves addressing infrastructural deficits and focusing on teacher training and curriculum development. The "Digital Pakistan" initiative aims to improve access to digital resources and promote the use of technology in classrooms (Khan & Ali, 2023). Strategies include expanding internet access in rural areas, providing affordable digital devices to schools, and implementing training programs to boost digital literacy among educators and students (Ahmed & Fatima, 2022). Additionally, integrating technology into teacher education programs is seen as essential for ensuring that future educators are equipped to leverage digital tools effectively (Raza & Bashir, 2023).

India's government's policy referred to as the "National Education Policy 2020" provides a strategy for digital transformation, emphasizing on the integration of technology at all levels of education. Key strategies include the development of digital infrastructure, such as the expansion of internet connectivity and the provision of digital devices to schools, particularly in underserved areas (Singh & Gupta, 2023). India also emphasizes the need for digital literacy programs for both educators and students to ensure effective use of technology in teaching and learning (Kumar & Reddy, 2022). Furthermore, the use of educational technology platforms to provide personalized learning experiences and the promotion of digital content creation are central to India's approach (Verma & Mehta, 2023).

In Ivory Coast, strategies for enhancing digital transformation focus on improving digital infrastructure and integrating technology into the educational system. The government has launched initiatives to increase access to digital tools and resources in schools, with a focus on rural and underserved areas (Koffi & Tano, 2023). Strategies include providing training for teachers to effectively use digital technologies, developing local content to make digital resources more relevant to the Ivorian context, and encouraging public-private partnerships to support digital education initiatives (Yao & Fadika, 2022). Enhancing internet connectivity and investing in digital literacy programs are also critical components of Ivory Coast's strategy to improve learning outcomes through digital transformation (N'Guessan & Kone, 2023). In Malawi, enhancing digital transformation involves addressing challenges related to infrastructure, training, and resource allocation. Strategies include expanding internet access and providing schools with digital devices to facilitate e-learning (Chirwa & Banda, 2023). The Malawian government and NGOs are also working to implement digital literacy programs for both educators and students, aiming to build the skills necessary for effective use of technology in education (Moyo & Phiri, 2022). Additionally, developing localized digital content and integrating technology into the curriculum are seen as key strategies to enhance learning outcomes and ensure that digital transformation efforts are aligned with local educational needs (Sikazwe & Mkhize, 2023).

In Burundi, strategies for enhancing digital transformation focus on overcoming infrastructure challenges and promoting digital literacy. Efforts are being made to improve internet connectivity and provide schools with digital tools and resources (Ndayishimiye & Ntibashirakandi, 2023). Training programs for teachers are crucial to ensure they can effectively integrate technology into their teaching practices (Munyaneza Habimana, 2022). Additionally,

there is a push to develop digital content that is relevant to the Burundian educational context and to foster collaboration between government, educational institutions, and private sector partners to support digital transformation initiatives (Nkurunziza & Havyarimana, 2023).

In Kenya, strategies to enhance digital transformation focus on expanding digital infrastructure, improving digital literacy, and integrating technology into the educational system. The "Digital Literacy Programme" aims to equip schools with digital devices and internet connectivity while promoting digital literacy among students and teachers (Mwangi & Kamau, 2023). Strategies also include providing professional development for educators to effectively use technology in teaching, developing localized digital content, and encouraging public-private partnerships to support digital education initiatives (Kibett & Omwoyo, 2022). Efforts are also being made to address disparities in access to digital resources between urban and rural areas to ensure equitable educational outcomes (Nyaboga & Mwakio, 2023).

2.4 Summary of Literature reviewed

The literature reviewed highlights the multifaceted influence and challenges of digital transformation in education across various global contexts. The integration of digital technologies has been shown to enhance the quality of learning and teaching by encouraging interactive, personalized, and accessible educational experiences. In countries like Germany, the Netherlands, and Australia, digital tools have been effectively incorporated into classrooms, leading to improved student engagement and learning outcomes (Schmidt et al., 2023; de Vries & van Dijk, 2023). However, in contexts such as Nigeria, Ghana, and Ethiopia, the challenges of digital transformation are more pronounced due to infrastructural deficits, socio-economic disparities, and varying levels of digital literacy among educators and students (Adewale & Akande, 2023; Boateng & Asare, 2023; Desta & Abebe, 2023).

The literature also emphasizes the importance of comprehensive strategies for overcoming these challenges and enhancing the effectiveness of digital transformation initiatives. In Malaysia, Pakistan, and India, government-led initiatives have focused on expanding digital infrastructure, improving teacher training, and integrating technology into the curriculum to create more equitable and effective learning environments (Jamaludin & Hassan, 2023; Khan & Ali, 2023; Singh & Gupta, 2023). Similarly, in African contexts such as Ivory Coast, Malawi, and Kenya, efforts are being made to address the digital divide, develop localized digital content, and foster partnerships between public and private sectors to support digital education (Koffi & Tano, 2023; Chirwa & Banda, 2023; Mwangi & Kamau, 2023).

Despite these efforts, the implementation of digital transformation in education remains a complex and evolving process. Challenges such as inadequate infrastructure, limited access to technology, and the need for ongoing professional development for educators continue to impede progress in many regions, particularly in developing countries (Phiri Mweemba, 2023; Nkurunziza & Havyarimana, 2023). Addressing these challenges requires sustained investment, policy support, and collaborative efforts to ensure that digital transformation leads to meaningful and lasting improvements in educational outcomes.

2.5 Gaps in literature

Despite the extensive research on digital transformation in education, several gaps remain that this study sought to address. One significant gap is the lack of in-depth analysis of digital transformation in public institutions within developing countries, particularly in the context of Kenya. Much of the existing literature focuses on developed countries where the infrastructure and resources to support digital transformation are already well-established, leaving a gap in understanding the unique challenges and opportunities in less-resourced settings (Adewale & Akande, 2023; Desta & Abebe, 2023).

Additionally, there is a paucity of studies examining the specific influence of digital transformation on the quality of learning and teaching in public sector training institutions like the Kenya School of Government (KSG) Baringo Campus. Most research tends to focus on

primary, secondary, or higher education institutions, often overlooking the dynamics within public sector training environments where digital transformation is equally critical but may face different challenges and requirements.

Another gap lies in the limited exploration of the strategies that can effectively overcome the barriers to digital transformation in these contexts. While several studies have discussed challenges such as infrastructure deficits and digital literacy, there is insufficient evidence on tailored, context-specific strategies that address these issues in a sustainable and scalable manner (Moyo & Phiri, 2022; Nkurunziza & Havyarimana, 2023). This study seeks to fill these gaps by providing a focused examination of digital transformation at KSG Baringo Campus, exploring its impacts on learning and teaching, identifying the specific challenges faced, and proposing actionable strategies to enhance digital transformation.

III. METHODOLOGY

3.1 Research Design

This study employed a descriptive research design, which aimed to provide a comprehensive analysis of the current state of digital transformation at KSG Baringo Campus, its influence on learning and teaching, and the associated challenges. Descriptive research is suitable for detailing the characteristics of the phenomenon under study and identifying patterns and relationships.

3.2 The Study Area

The study was conducted at The Kenya School of Government (KSG) Baringo Campus, which serves as the focus of this research on digital transformation in educational settings. This location provided a relevant context for exploring the influence and challenges of implementing digital technologies in a public sector training institution.

3.3 Target Population

The target population refers to the entire group of individuals or elements that the research aims to understand. For this study, the target population included 53 respondents, consisting of 35 SMC Students, and 18 SLDP students. This group represents those directly affected by digital transformation initiatives and can provide valuable insights into the study's objectives.

3.4 Sample Size

Sample size is the number of individuals or elements selected from the target population. From the target population of 53 respondents, the sample size was determined using Krejcie and Morgan Formulae.

This is given as

$$n = \frac{X^2 * N * P * (1 - P)}{(ME^2 * (N - 1)) + (X^2 * P * (1 - P))}$$

Where;

n=Sample size

X^2 =Chi Square for the specified confidence level at 1 degree of freedom= (3.841)
from tables

N=Population size

P=Population proportion

ME=Desired margin of error (expressed as a proportion=0.05)

$$= 3.841 \times 53 \times 0.5 (1-0.5) / 0.05 \times 0.05 (53-1) + 3.841 \times 0.5 (1-0.5) \\ = 47$$

Therefore, using the formula, a total of 47 respondents were selected to participate in the study.

3.5 Sampling Method and Procedure

This study employed stratified random sampling, where the population is divided into distinct strata (e.g., SMC Students, and SLDP students) and random samples are drawn from each stratum. This approach ensures that all relevant sub-groups are adequately represented in the sample, providing a more accurate reflection of the entire population.

3.6 Research Instruments, Data Analysis and Presentation

This study used closed ended questionnaires to collect primary data from respondents. The questionnaire had a structured set of questions designed to gather data from respondents. The questionnaire included questions related to digital tools usage, influence on learning, and the influence training and digital literacy among students and faculty on learning outcomes. Quantitative data was analyzed using appropriate statistical methods, particularly descriptive statistics, utilizing SPSS tool. Findings were comprehensively presented using graphical methods including tables, charts, and narrative summaries to effectively communicate qualitative insights and quantitative trends.

3.7 Reliability of Research Instruments

Reliability refers to the consistency and stability of the research instruments. To ensure reliability, the questionnaire was piloted with a small group of participants from SMC 192 Online Class. This process helped identify and rectify any issues with the instruments, ensuring that they produce consistent and reliable results.

3.8 Ethical Considerations

Ethical considerations involve ensuring that the research is conducted in a manner that respects the rights and dignity of participants. This study adhered to ethical guidelines by obtaining informed consent from all participants, ensuring confidentiality of responses, and using the data solely for research purposes. Participants were fully informed about the study's objectives, procedures, and their right to withdraw at any time without consequence.

IV. RESULT AND DISCUSSION

4.1 Demographic Analyses, Gender, Age and Educational Level

To gain a better understanding of the respondents, three demographic attributes; gender, aged and level of education was analysed and the result presented under:

The data on gender distribution among respondents shows that a majority were female, with 21 (55.3%) respondents identifying as female, and 17 (44.7%) identifying as male. This indicates a relatively balanced representation, with a slight majority of female respondents. The gender distribution is essential in analyzing any potential differences in responses that may be influenced by gender, particularly in areas such as comfort with digital tools and perceived challenges in digital transformation.

Regarding the age bracket of respondents, the majority, 16(42.1%), were within the 31-40 years age range. This was followed by 11 (28.9%) in the 41-50 years age range, 7 (18.4%) in the 21-30 years age range, and 4 (10.5%) who were over 50 years old. The distribution indicates that most respondents are within the mid-career age group, which could influence their views on digital transformation, as they may have a mix of traditional and modern educational experiences. Younger respondents might be more adaptable to digital changes, while older respondents might have more experience but could face challenges adapting to new technologies. In terms of education level, the majority of respondents, 18 (47.4%), had attained a

Bachelor's degree. This was followed by 13 (34.2%) with a Master's degree, 5 (13.2%) with a diploma, and 2 (5.3%) with a Ph.D. This distribution suggests that the respondents are generally well-educated, with a strong representation of individuals holding higher education qualifications. The high level of education among respondents has influence their ability to engage with digital tools and their expectations regarding the quality and effectiveness of digital transformation in their work environment.

4.2: Current State Digital Transformation

The first objective of this study was to assess the current state of digital transformation. Study respondents were requested asked to rate their agreement/disagreement on a Likert scale. Results were as tabulated in Table 4.1.

Table 4.1 Current State Digital Transformation

Statement	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
The digital infrastructure at KSG Baringo Campus is up-to-date and reliable.	5 (13.2%)	8 (21.1%)	4 (10.5%)	14 (36.8%)	7 (18.4%)
There is sufficient access to digital tools and resources for both students and staff.	3 (7.9%)	6 (15.8%)	4 (10.5%)	16 (42.1%)	9 (23.7%)
Digital transformation is given a key focus in the campus's strategic plan.	4 (10.5%)	7 (18.4%)	3 (7.9%)	15 (39.5%)	9 (23.7%)
The campus administration regularly updates and maintains digital systems.	4 (10.5%)	5 (13.2%)	4 (10.5%)	18 (47.4%)	7 (18.4%)
Staff and students are well-trained in using digital platforms and tools.	2 (5.3%)	7 (18.4%)	4 (10.5%)	18 (47.4%)	7 (18.4%)

A majority of respondents, 14 (36.8%), agreed that the digital infrastructure at KSG Baringo Campus is up-to-date and reliable, with an additional 7 (18.4%) strongly agreeing. However, 8 (21.1%) disagreed, 5 (13.2%) strongly disagreed, and 4 (10.5%) were undecided. This indicates that while over half of the respondents (55.2%) view the infrastructure positively, there is still a notable proportion (34.3%) who perceive issues with its reliability and modernity, highlighting a potential area for improvement.

Regarding access to digital tools and resources, 16 (42.1%) of respondents agreed that access is sufficient, and 9 (23.7%) strongly agreed. Conversely, 6 (15.8%) disagreed, 3(7.9%) strongly disagreed, and 4 (10.5%) were undecided. These responses suggest that although the majority (65.8%) find the access adequate, there is still a significant minority (23.7%) who feel otherwise, indicating possible disparities in tool accessibility.

When asked if digital transformation is a key focus in the campus's strategic plan, 15 (39.5%) of respondents agreed and 9 (23.7%) strongly agreed. However, 7 (18.4%) disagreed, 4 (10.5%) strongly disagreed, and 3 (7.9%) were undecided. This implies that while the majority (63.2%) recognize digital transformation as a strategic priority, a substantial portion (28.9%) either do not see it as such or are unsure, suggesting that the strategic focus might not be fully communicated across the institution.

In terms of maintaining and updating digital systems, 18 (47.4%) agreed that the campus administration regularly updates and maintains these systems, and 7 (18.4%) strongly agreed. On the other hand, 5 (13.2%) disagreed, 4 (10.5%) strongly disagreed, and 4 (10.5%) were undecided. These results show that a majority (65.8%) feel the administration is proactive in this area, though a notable minority (23.7%) do not share this view, indicating room for improvement in system maintenance.

Lastly, 18 (47.4%) of respondents agreed that staff and students are well-trained in using digital platforms and tools, and 7 (18.4%) strongly agreed. However, 7 (18.4%) disagreed, 2 (5.3%) strongly disagreed, and 4 (10.5%) were undecided. This implies that while a majority (65.8%) believe training is adequate, a significant proportion (23.7%) feel otherwise, highlighting a need for enhanced training programs.

4.3: Influence of availability and quality of digital infrastructure and support systems

The second objective of this study was to examine the Influence of Digital Tools on Quality of Learning and Teaching. Respondents were requested to rate their agreement or disagreement on a Likert scale. Results were as summarized in Table 4.2.

Table 4.2: Influence of availability and quality of digital infrastructure and support systems

Statement	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Digital tools have enhanced the overall quality of teaching at KSG Baringo Campus.	4 (10.5%)	6 (15.8%)	4 (10.5%)	15 (39.5%)	9 (23.7%)
Students' engagement in learning activities has improved with the use of digital platforms.	3 (7.9%)	7 (18.4%)	4 (10.5%)	16 (42.1%)	8 (21.1%)
E-learning has positively influenced students' understanding and retention of course, material.	5 (13.2%)	6 (15.8%)	3 (7.9%)	14 (36.8%)	10 (26.3%)
The quality of interactions between students and lecturers has improved through digital means.	4 (10.5%)	8 (21.1%)	4 (10.5%)	14 (36.8%)	8 (21.1%)
Digital transformation has made access to educational resources easier and more efficient.	3 (7.9%)	5 (13.2%)	4 (10.5%)	17 (44.7%)	9 (23.7%)

When asked whether digital tools have enhanced the overall quality of teaching, a majority of respondents, 15 (39.5%), agreed with this statement, while 9 (23.7%) strongly agreed. However, 6 (15.8%) disagreed, 4 (10.5%) strongly disagreed, and 4 (10.5%) were undecided. This indicates that while there is a significant positive perception regarding the impact of digital tools on teaching quality, a notable minority of respondents remain unconvinced or uncertain, suggesting the need for further assessment and possibly improvements in how digital tools are utilized in teaching.

Similarly, concerning whether students' engagement in learning activities has improved with the use of digital platforms, 16 (42.1%) of respondents agreed, and 8 (21.1%) strongly agreed. In contrast, 7 (18.4%) disagreed, 4 (10.5%) strongly disagreed, and 4 (10.5%) were undecided. This implies that the majority of respondents see an enhancement in student engagement due to digital platforms, though a significant portion does not, indicating variability in experiences or perceptions of the effectiveness of these platforms.

Furthermore, in response to whether e-learning has positively influenced students' understanding and retention of course material, 14 (36.8%) of respondents agreed, and 10 (26.3%) strongly agreed. Meanwhile, 6 (15.8%) disagreed, 5 (13.2%) strongly disagreed, and 3 (7.9%) were undecided. This suggests that there is a general consensus among respondents that e-learning has a positive impact on students' comprehension and retention, although a portion of the respondents still holds reservations.

Moreover, regarding the quality of interactions between students and lecturers through digital means, 14 (36.8%) of respondents agreed that it has improved, with 8 (21.1%) strongly agreeing. Conversely, 8 (21.1%) disagreed, 4 (10.5%) strongly disagreed, and 4 (10.5%) were undecided. This finding highlights a majority opinion that digital tools have enhanced student-lecturer interactions, though there remains a significant minority who either disagree or are uncertain, possibly due to varying levels of digital literacy or differing experiences with digital platforms.

Lastly, when asked whether digital transformation has made access to educational resources easier and more efficient, 17 (44.7%) of respondents agreed, with 9 (23.7%) strongly agreeing. On the other hand, 5 (13.2%) disagreed, 3 (7.9%) strongly disagreed, and 4 (10.5%) were undecided. This implies that the majority of respondents recognize the benefits of digital transformation in improving access to educational resources, though there remains a portion who do not fully share this view, suggesting that challenges in access or usability might still exist.

4.4 Influence of Training and digital literacy among students and faculty contribute to the effectiveness of learning

The third objective of this study was to identify the challenges faced in implementing digital transformation. Respondents were requested to rate their agreement or disagreement on a Likert scale. Results were as summarized in Table 4.3.

Table 4.3 Influence of Training and digital literacy among students and faculty contribute to the effectiveness of learning

Statement	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Financial constraints are a significant barrier to implementing digital transformation.	5 (13.2%)	7 (18.4%)	3 (7.9%)	11 (28.9%)	12 (31.6%)
There is resistance to digital transformation among some staff and students.	7 (18.4%)	9 (23.7%)	3 (7.9%)	13 (34.2%)	6 (15.8%)
The campus faces challenges in maintaining and updating digital infrastructure.	5 (13.2%)	9 (23.7%)	3 (7.9%)	17 (44.7%)	4 (10.5%)
The lack of technical support hinders effective use of digital tools.	9 (23.7%)	5 (13.2%)	3 (7.9%)	13 (34.2%)	8 (21.1%)
Inadequate training is a	7 (18.4%)	5	3 (7.9%)	15	8 (21.1%)

challenge to the successful	(13.2%)	(39.5%)
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Firstly, a significant number of respondents, 12 (31.6%), strongly agreed that financial constraints are a significant barrier to implementing digital transformation. This was followed by 11 (28.9%) who agreed, 7 (18.4%) who disagreed, 5 (13.2%) who strongly disagreed, and 3 (7.9%) who were undecided. This implies that financial limitations are a widely acknowledged obstacle, with nearly 60.5% of the respondents highlighting this issue, which could hinder the successful implementation of digital initiatives.

Similarly, regarding resistance to digital transformation among staff and students, 13 (34.2%) of respondents agreed that there is resistance, and 6 (15.8%) strongly agreed. Conversely, 9 (23.7%) disagreed, 7 (18.4%) strongly disagreed, and 3 (7.9%) were undecided. This shows that although a significant portion of respondents recognizes resistance as a challenge, a sizable number do not perceive it as a major issue, indicating varying levels of acceptance and adaptation among stakeholders.

Furthermore, when asked about the challenges in maintaining and updating digital infrastructure, 17 (44.7%) of respondents agreed that this is an issue, with 4 (10.5%) strongly agreeing. On the other hand, 9 (23.7%) disagreed, 5 (13.2%) strongly disagreed, and 3 (7.9%) were undecided. This finding suggests that while a majority acknowledge infrastructure maintenance as a challenge, a considerable portion does not, potentially reflecting differences in the experiences of respondents based on their roles or perspectives.

Moreover, concerning the lack of technical support, 13 (34.2%) of respondents agreed that this hinders the effective use of digital tools, with 8 (21.1%) strongly agreeing. Meanwhile, 9 (23.7%) strongly disagreed, 5 (13.2%) disagreed, and 3 (7.9%) were undecided. This indicates that the majority recognize a need for better technical support, which is crucial for the effective implementation of digital transformation.

Finally, regarding inadequate training as a challenge, 15 (39.5%) of respondents agreed that this is an issue, followed by 8 (21.1%) who strongly agreed, 7 (18.4%) who strongly disagreed, 5 (13.2%) who disagreed, and 3 (7.9%) who were undecided. This highlights that inadequate training is perceived as a significant challenge by most respondents, which could impact the overall success of digital initiatives at the campus.

4.5 Elements of learning outcomes

The purpose of the study was to assess the influence of digital transformation on learning in public institutions taking a case of Kenya School of Government, Baringo Campus. Respondents were requested to rate their agreement or disagreement on a Likert scale. Results were as summarized in table 4.4

Table 4.4 Elements of learning outcomes

Statement	SD	D	U	A	SA
Digital transformation has led to improved student learning outcomes.	5 (13.2%)	7 (18.4%)	3 (7.9%)	11 (28.9%)	12 (31.6%)
There is a noticeable increase in student performance due to the integration of digital tools.	3 (7.9%)	9 (23.7%)	3 (7.9%)	13 (34.2%)	10 (26.3%)
Students are better able to apply knowledge practically through digital learning methods.	5 (13.2%)	7 (18.4%)	3 (7.9%)	13 (34.2%)	10 (26.3%)
The use of digital platforms has enhanced critical thinking and	3 (7.9%)	9 (23.7%)	2 (5.3%)	13 (34.2%)	11 (28.9%)

problem-solving skills in students.					
Digital transformation has facilitated better student collaboration and group work.	5 (13.2%)	5 (13.2%)	3 (7.9%)	15 (39.5%)	10 (26.3%)

When asked whether digital transformation has led to improved student learning outcomes, 12 (31.6%) of respondents strongly agreed, and 11 (28.9%) agreed. However, 7 (18.4%) disagreed, 5 (13.2%) strongly disagreed, and 3 (7.9%) were undecided. This indicates that a significant majority, 60.5%, believe that digital transformation has positively impacted student learning outcomes. Nonetheless, the presence of 31.6% of respondents who either disagree or are undecided suggests that there are still some reservations or challenges in realizing these improvements universally.

Similarly, regarding whether there is a noticeable increase in student performance due to the integration of digital tools, 13 (34.2%) of respondents agreed, and 10 (26.3%) strongly agreed. Conversely, 9 (23.7%) disagreed, 3 (7.9%) strongly disagreed, and 3 (7.9%) were undecided. This implies that while a majority, 60.5%, acknowledge a positive influence of digital tools on student performance, there remains a significant proportion, 31.6%, who do not share this view or are uncertain, highlighting the need for further investigation or enhancement of these tools' effectiveness.

Moreover, when asked whether students are better able to apply knowledge practically through digital learning methods, 13 (34.2%) of respondents agreed, and 10 (26.3%) strongly agreed. Meanwhile, 7 (18.4%) disagreed, 5 (13.2%) strongly disagreed, and 3 (7.9%) were undecided. This finding suggests that a majority of respondents perceive an improvement in students' practical application of knowledge through digital learning, though nearly a third remain unconvinced or uncertain, possibly pointing to gaps in the practical integration of these tools in the curriculum.

Additionally, concerning whether the use of digital platforms has enhanced critical thinking and problem-solving skills in students, 13 (34.2%) of respondents agreed, with 11 (28.9%) strongly agreeing. On the other hand, 9 (23.7%) disagreed, 3 (7.9%) strongly disagreed, and 2 (5.3%) were undecided. This implies that a substantial majority, 63.1%, view digital platforms as beneficial in enhancing critical thinking and problem-solving skills, although a notable minority remains sceptical, indicating that the impact of digital tools on these skills may vary depending on their implementation and use.

Lastly, regarding whether digital transformation has facilitated better student collaboration and group work, 15 (39.5%) of respondents agreed, and 10 (26.3%) strongly agreed. Conversely, 5 (13.2%) strongly disagreed, 5 (13.2%) disagreed, and 3 (7.9%) were undecided. This finding suggests that a majority of respondents, 65.8%, believe that digital transformation has improved collaboration and group work among students, yet the existence of dissenting views or uncertainty in 34.3% of respondents highlights that there may be challenges or inconsistencies in how digital tools are used to foster collaboration.

V. CONCLUSION AND FUTURE SCOPE

5.1 Summary of Findings

5.1.1 Digital tools and resources influence the learning experience

5.1.1 Availability and quality of digital infrastructure and support systems and State of Digital Transformation

The findings revealed that while over half of the respondents (55.2%) viewed the digital infrastructure positively, a significant proportion (34.3%) identified issues with its reliability and modernity. Additionally, the majority of respondents (65.8%) believed that

access to digital tools and resources was adequate, yet 23.7% felt otherwise, indicating disparities in tool accessibility. Furthermore, 63.2% of respondents recognized digital transformation as a strategic priority, though 28.9% were either unsure or did not perceive it as such, suggesting that strategic communication may not be fully effective across the institution. While most respondents (65.8%) felt the administration was proactive in maintaining and updating digital systems, a notable minority (23.7%) disagreed. Similarly, 65.8% of respondents believed that staff and students were well-trained in using digital platforms and tools, but 23.7% indicated a need for enhanced training programs.

5.1.2 Influence of Digital Tools on Learning and Teaching

The study found that a majority of respondents (63.2%) believed digital tools positively influenced the quality of teaching, student engagement, understanding, and retention of course material. However, a significant minority remained unconvinced or uncertain, suggesting the need for further improvements in how digital tools are utilized. Additionally, 57.9% of respondents agreed that digital tools had improved the quality of interactions between students and lecturers, yet a considerable proportion expressed reservations. The majority also recognized the benefits of digital transformation in improving access to educational resources, though challenges in access or usability might still exist.

5.1.3 Challenges in Implementing Digital Transformation

Financial constraints were identified as a significant barrier, with nearly 60.5% of respondents highlighting this issue. Resistance to digital transformation among staff and students was recognized by 50% of respondents, while the remaining respondents did not perceive it as a major issue. Maintaining and updating digital infrastructure was also seen as a challenge by 55.2% of respondents, though a substantial portion did not share this view. Lack of technical support and inadequate training were additional challenges, with the majority of respondents emphasizing the need for better technical support and enhanced training programs to ensure the success of digital initiatives.

5.1.4 Learning Outcomes

The study revealed that 60.5% of respondents believed digital transformation had positively impacted student learning outcomes, though 31.6% expressed reservations or uncertainty. Similarly, while 60.5% of respondents acknowledged a positive influence of digital tools on student performance, a significant proportion remained unconvinced. The majority of respondents perceived improvements in students' practical application of knowledge, critical thinking, and problem-solving skills due to digital learning, though a notable minority were sceptical. Furthermore, 65.8% of respondents believed that digital transformation had enhanced student collaboration and group work, yet challenges or inconsistencies in the use of digital tools were identified by 34.3% of respondents.

5.2 Conclusions

Based on the findings, several conclusions can be drawn regarding the state of digital transformation and its impact on learning and teaching at the Kenya School of Government (KSG) Baringo Campus. First, while the digital transformation efforts at the campus have been recognized as a strategic priority by the majority of respondents, there is a notable gap in the perceived effectiveness of these initiatives. Although over half of the respondents view the digital infrastructure and access to digital tools positively, a significant minority expresses concerns about the reliability and accessibility of these resources. This suggests that, while progress has been made, there is still room for improvement in ensuring that the digital infrastructure meets the needs of all stakeholders.

Second, the influence of digital tools on the quality of learning and teaching is generally viewed positively, with the majority of respondents acknowledging their beneficial impact on

teaching quality, student engagement, understanding, and retention of course material. However, the existence of a substantial minority who remain unconvinced or uncertain indicates that the implementation and utilization of these tools may not be consistent or fully effective across the campus. This inconsistency could be due to varying levels of digital literacy or the uneven integration of digital tools into the curriculum.

Third, the challenges in implementing digital transformation, particularly financial constraints, resistance to change, and inadequate technical support and training, are significant barriers that need to be addressed. The widespread recognition of financial limitations as a major obstacle underscores the need for sustained investment in digital infrastructure and resources. Additionally, the mixed perceptions regarding resistance to digital transformation and the adequacy of technical support and training suggest that efforts to build a more inclusive and supportive digital environment are essential for the success of these initiatives.

Lastly, while digital transformation has led to perceived improvements in student learning outcomes, critical thinking, problem-solving skills, and collaboration, the presence of dissenting views or uncertainties highlights the ongoing challenges in realizing these benefits universally. The varying experiences and perceptions of respondents suggest that there may be disparities in how digital tools are applied or supported within the campus, necessitating a more targeted approach to address these gaps.

5.3 Recommendations

Based on the findings, this study made the following recommendations;

There is a need to enhance the reliability and accessibility of digital infrastructure and tools to ensure that all students and staff can fully benefit from digital transformation initiatives. This could involve upgrading existing systems, expanding access to digital resources, and regularly assessing the infrastructure to address any gaps or inconsistencies in service.

There is a need to improve the integration and utilization of digital tools in the teaching and learning process by providing targeted training and support to both faculty and students. This would help to bridge the gap in digital literacy, ensure more consistent use of digital tools across the curriculum, and maximize the positive impact on student engagement and learning outcomes.

There is a need to address financial constraints that hinder the implementation and sustainability of digital transformation initiatives. This could be achieved by securing additional funding, exploring cost-effective solutions, and prioritizing investments that directly enhance the digital learning environment. Additionally, building partnerships with external organizations or leveraging government resources could provide additional financial support.

There is a need to foster a more inclusive and supportive environment for digital transformation by addressing resistance to change and improving the availability of technical support. This may involve promoting a culture of digital innovation, providing incentives for early adopters, and establishing dedicated support teams to assist with the transition to digital learning and teaching methods. Engaging stakeholders in the planning and implementation process can also help to build a sense of ownership and reduce resistance.

5.5 Suggestions for further studies

This study left notable several gaps that require further investigations including:

There is a need to explore the long-term effects of digital transformation on student performance and career readiness to determine how digital tools and learning environments influence graduates' success in the workforce.

There is a need to investigate the impact of digital transformation on the inclusivity and accessibility of education for students with disabilities to ensure that digital tools are effectively supporting all learners, regardless of their individual needs.

There is a need to examine the role of digital transformation in enhancing teacher professional development and continuous learning to understand how digital tools can be leveraged to improve teaching practices and educator skills.

There is a need to assess the effectiveness of different digital tools and platforms in improving student engagement and learning outcomes to identify which technologies are most beneficial in various educational contexts.

There is a need to study the challenges and strategies for implementing digital transformation in rural and under-resourced educational institutions to address disparities in access and ensure equitable digital learning opportunities.

There is a need to analyse the influence of organizational culture on the adoption and success of digital transformation initiatives to better understand how cultural factors within an institution can support or hinder the digital shift.

REFERENCES

- Abdi, A., & Ibrahim, A. "The impact of socio-political instability on digital transformation in Somali education. *Somalia Educational Review*, Vol. 8, Issue. 1, pp.45-60, 2023.
- Ahmed, N., & Fatima, S. "Digital education in Pakistan: Current strategies and future prospects. *Pakistani Journal of Educational Technology*, Vol. 7, Issue. 1, pp.44-59, 2022.
- Ankomah-Asare, E. T., Asante, E., & Andoh, S. "The impact of digital technologies on teaching and learning in Ghanaian schools. *Journal of Educational Technology Development and Exchange*, Vol. 15, Issue. 1, pp.45-58, 2022.
- Assefa, A., & Abate, D. "Bridging the digital divide in Ethiopian education: Challenges and opportunities. *African Journal of Education Studies*, Vol. 10, Issue. 3, pp.67-82, 2022.
- Blanc, J., Lemoine, A., & Martin, G. "Digital inequality in French schools: An analysis of urban-rural disparities. *French Journal of Education Policy*, Vol. 12, Issue. 2, pp.102-115, 2023.
- Brown, C. "Digital transformation in education: A framework for future research. *Educational Technology Review*, Vol. 29, Issue. 2, pp.123-136, 2022.
- Chileshe, P., & Kunda, S. "The state of digital education in Zambia: Challenges and prospects. *Zambian Journal of Education Studies*, Vol. 11, Issue. 3, pp.77-92, 2022.
- Chirwa, K., & Banda, S. "Enhancing digital education in Malawi: Infrastructure, training, and policy recommendations. *Malawian Journal of Education and Technology*, Vol. 10, Issue. 2, pp.76-89, 2023.
- Deschamps, M., & Moreau, A. "Digital transformation in French education: Current challenges and future directions. *European Journal of Education Technology*, Vol. 18, Issue. 4, pp.134-148, 2022.
- Eickelmann, B., & Gerick, J. "DigitalPakt Schule: Evaluating the impact of digital infrastructure on learning outcomes in Germany. *European Journal of Education*, Vol. 57, Issue. 4, pp.519-534, 2022.
- Jamaludin, M., & Hassan, R. "Strategies for integrating technology into Malaysian education: A review of current practices. *Journal of Southeast Asian Education*, Vol. 19, Issue. 1, pp.58-72, 2023.
- Kavuma, J., Muwanga, R., & Nsubuga, J. "Digital transformation in Ugandan education: Progress and challenges. *East African Educational Review*, Vol. 22, Issue.1, pp.12-28, 2023.
- Kennisnet. "Digital education in the Netherlands: Trends and insights. *Kennisnet Report*, 2023.
- Khan, M., & Ali, A. "Digital Pakistan: Strategies for enhancing digital education. *Journal of South Asian Education*, Vol. 15, Issue. 2, pp.101-115, 2023.
- Kibett, J., & Omwoyo, C. "Evaluating Kenya's Digital Literacy Programme:

- Achievements and challenges. *Kenyan Educational Review*, Vol. **14**, Issue. **2**, pp.**65-80**, **2022**.
- Koffi, A., & Tano, A. "Digital transformation in Ivory Coast: Strategies and challenges. *Ivorian Journal of Education and Technology*, Vol. **12**, Issue. **1**, pp.**32-47**, **2023**.
- Kumar, A., & Reddy, S. "National Education Policy 2020: A roadmap for digital transformation in Indian education. *Indian Journal of Educational Technology*, Vol. **8**, Issue. **3**, pp.**21-35**, **2022**.
- Lamb, S., Maire, Q., & Doecke, E. "Remote learning and digital education in Australia: Lessons from the pandemic. *Australian Journal of Education*, Vol. **66**, Issue. **1**, pp.**28-45**, **2022**.
- Lima, A., Silva, R., & Freitas, D. "Challenges in digital education: A Brazilian perspective. *Brazilian Journal of Educational Technology*, Vol. **10**, Issue. **2**, pp.**56-71**, **2023**.
- Mdee, A., Komba, K., & Nsubuga, F. "Bridging the digital divide in Tanzanian education: Insights and recommendations. *Tanzanian Journal of Educational Research*, Vol. **13**, Issue. **2**, pp.**19-33**, **2022**.
- Mishra, P., & Koehler, M. J. "Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, Vol. **108**, Issue. **6**, pp.**1017-1054**, **2006**.
- Mohamed, S., & Yusuf, H. "Digital transformation and educational challenges in Somalia. *Horn of Africa Education Journal*, Vol. **14**, Issue. **1**, pp.**34-49**, **2022**.
- Moyo, T., & Phiri, M. "Addressing digital divide in Malawian education: A strategy for inclusive digital transformation. *African Journal of Educational Innovation*, Vol. **11**, Issue. **2**, pp.**54-68**, **2022**.
- Mugisha, J., & Ngalinda, B. "Digital transformation in Tanzanian schools: Barriers and opportunities. *East African Journal of Education and Technology*, Vol. **5**, Issue. **1**, pp.**44-59**, **2023**.
- Munyaneza, E., & Habimana, A. "Digital education strategies in Burundi: Opportunities and challenges. *Burundian Journal of Educational Studies*, Vol. **9**, Issue. **1**, pp.**77-89**, **2022**.
- Mutisya, D. N., & Makokha, G. "The digital divide in Kenyan schools: Challenges and solutions. *Kenyan Journal of Digital Education*, Vol. **12**, Issue. **2**, pp.**38-55**, **2023**.
- Mwangi, J., & Kamau, M. "Evaluating the impact of digital tools on education quality in Kenya. *Kenyan Journal of Digital Learning*, Vol. **16**, Issue. **2**, pp.**85-100**, **2022**.
- Mwangi, J., & Kamau, M. "Digital transformation in Kenyan schools: Progress, challenges, and strategies. *Kenya Education Review*, Vol. **15**, Issue. **1**, pp.**12-27**, **2023**.
- N'Guessan, J., & Kone, F. "Digital education in Ivory Coast: An assessment of current strategies and future directions. *West African Journal of Educational Technology*, Vol. **8**, Issue. **1**, pp.**45-60**, **2023**.
- Namukasa, I., Mwesige, J., & Kyeyune, C. "Digital transformation in Uganda's education system: A post-pandemic perspective. *Ugandan Journal of Education and Technology*, Vol. **8**, Issue. **3**, pp.**70-85**, **2022**.
- Ng, L., & Wong, M. "Adapting to digital transformation: Challenges faced by educators in Singapore. *Singapore Journal of Educational Technology*, Vol. **7**, Issue. **1**, pp.**22-37**, **2023**.
- Nkurunziza, J., & Havyarimana, J. "Strategies for advancing digital transformation in Burundian education. *Journal of East African Education*, Vol. **6**, Issue. **2**, pp.**67-82**, **2023**.
- Nyaboga, B., & Mwakio, D. "Digital literacy and educational outcomes in Kenya: A critical analysis. *Kenya Education Review*, Vol. **15**, Issue. **1**, pp.**47-62**, **2023**.
- Nyagowa, A., Gathara, D., & Kimani, J. "Digital literacy and educational outcomes in Kenyan primary schools", *Kenya Education Review*, Vol. **14**, Issue. **1**, pp.**59-72**, **2023**.

- Ojo, O. O., Adebayo, F., & Obayemi, O. "E-learning adoption in Nigerian higher education: Progress, challenges, and opportunities", *Journal of African Education*, Vol. **6**, Issue. **2**, pp.45-63, 2022.
- Oke, A., & Olatunde, F. "Barriers to digital transformation in Nigerian education: An empirical study", *Journal of Educational Management and Policy Studies*, Vol. **18**, Issue. **2**, pp.125-138, 2023.
- Oliveira, T., & Silva, M. "The impact of digital infrastructure on educational equity in Brazil", *Journal of Latin American Education Studies*, Vol. **11**, Issue. **4**, pp.91-104, 2023.
- Owusu-Ansah, M., & Mwinlaaru, K. "Integrating digital tools in Ghanaian education: A review of policies and practices", *Ghana Journal of Education Research*, Vol. **9**, Issue. **1**, pp.102-116, 2023.
- Phiri, K., & Mweemba, R. "Challenges and prospects of digital education in Zambia", *Zambia Journal of Educational Innovation*, Vol. **8**, Issue. **2**, pp.30-46, 2023.
- Raza, A., & Bashir, H. "Enhancing digital education in Pakistan: An overview of current initiatives and challenges", *Pakistan Educational Review*, Vol. **13**, Issue. **2**, pp.98-113, 2023.
- Schmid, U., Goertz, L., & Behrens, J. "The role of digital literacy in the successful implementation of digital education in Germany", *Digital Education Review*, Vol. **35**, Issue. **2**, pp.90-105, 2023.
- Selwyn, N., Eynon, R., & Potter, J. "Digital education in Australia: Critical perspectives and future directions", *Learning, Media and Technology*, Vol. **47**, Issue. **1**, pp.1-16, 2022.
- Sikazwe, M., & Mkhize, N. "Improving digital learning in Malawi: Strategies and implications", *Malawian Journal of Educational Research*, Vol. **7**, Issue. **3**, pp.45-59, 2023.
- Singh, P., & Gupta, R. "The impact of National Education Policy 2020 on digital transformation in India", *Indian Journal of Educational Policy*, Vol. **12**, Issue. **4**, pp.134-149, 2023.
- Tan, C., & Choo, H. "Balancing digital and traditional teaching methods in Singapore: A review of current practices", *Asian Journal of Education Technology*, Vol. **6**, Issue. **1**, pp.63-78, 2022.
- Tilahun, T., Belay, S., & Abebe, G. "Challenges and prospects of digital education in Ethiopia", *Journal of Ethiopian Educational Research*, Vol. **11**, Issue. **2**, pp.45-59, 2023.
- Verma, P., & Mehta, R. "Leveraging educational technology for personalized learning in India", *Asian Journal of Educational Technology*, Vol. **9**, Issue. **1**, pp.78-91, 2023.
- Voogt, J., Roblin, N. P., & Tondeur, J. "The impact of digital technologies on teaching and learning in the Netherlands", *Technology, Pedagogy and Education*, Vol. **31**, Issue. **1**, pp.89-104, 2022.
- Wamuyu, P. "Digital tools in public sector training: A case study of the Kenya School of Government", *African Journal of Public Administration*, Vol. **15**, Issue. **2**, pp.67-81, 2023.
- Yao, N., & Fadika, K. "Advancing digital education in Ivory Coast: Current strategies and future outlook", *Ivorian Journal of Educational Innovation*, Vol. **7**, Issue. **3**, pp.23-40, 2022.
- Yusof, Y., & Ng, C. "Utilizing data analytics for improving educational outcomes in Malaysia", *Malaysian Journal of Data Science*, Vol. **5**, Issue. **2**, pp.99-115, 2023.