INFLUENCE OF DIGITAL TRANSFORMATION ON PERFORMANCE OF INSTITUTIONS OF HIGHER LEARNING WITHIN NAIROBI COUNTY, KENYA: A CASE STUDY OF GRAFFINS COLLEGE

LEE HYEIN

A THESIS SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF
THE DEGREE OF MASTERS IN BUSINESS ADMINISTRATION

PAN AFRICA CHRISTIAN UNIVERSITY

JUNE 2026

DECLARATION

This thesis is my original work and has not been presented to any college or university for academic credit.

Signature: ……. Date:

Lee Hyein
MBAD/20314/0/21

This dissertation has been presented for examination with our approval as the University Supervisors.

Signatute: …….. Date: ……..
Dr. Daniel Mulinge Nthenge,
Department of Business Administration,
Pan Africa Christian University

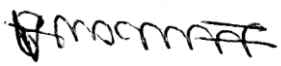
Signatute:  Date: 28th January 2026
Dr. Beatrice Aluoch Oduor,
Associate Professor
Teesside University

TABLE OF CONTENTS

DECLARATION ..... **ii**

DEDICATION ..... **vii**

ACKNOWLEDGEMENT ..... **viii**

ABSTRACT ..... **ix**

LIST OF TABLES ..... **x**

LIST OF FIGURES ..... **xii**

ABBREVIATIONS AND ACRONYMS ..... **xiii**

OPERATIONAL DEFINITION OF TERMS ..... **xiv**

CHAPTER ONE: INTRODUCTION AND BACKGROUND TO THE STUDY **1**

Background to the Study 1

Digital Transformation 4

The Performance of Institutions of Higher learning 7

The Context of the Study: Graffins College 9

Statement of the Problem 11

Objectives of the study 15

General Objective 15

Specific Objectives 15

Hypotheses 16

Assumptions of the study 16

Justification of the Study 17

Significance of the Study 18

Scope of the Study 19

Limitations and Delimitations of the Study 19

Chapter Summary 20

CHAPTER TWO: LITERATURE REVIEW **22**

Introduction 22

Empirical literature reviews 22

Digital Transformation 22

The Indicators of a Digital Transformation Strategy 23

Technology-based Learning and Performance of Institutions of higher learning 24
Partnership and Performance of Institutions of higher learning 25
Innovation and Performance of Institutions of higher learning 26
Research and Development and Performance of HEIs 28
Performance of Institutions of Higher Learning 29
Academic Service Effectiveness 29
Administrative Efficiency 30
Digital Learning Ecosystem Performance 31
Customer Satisfaction 32
Theoretical Literature Review 33
Resource-Based View (RBV) Theory 33
Dynamic Capability Theory (DCT) 34
Educational Process Reengineering (EPR) Theory 35
A Synthesis of Research Gaps 36
Conceptual framework 39
Chapter Summary 41
CHAPTER THREE: RESEARCH METHODOLOGY 43
Introduction 43
Research Philosophy 43
Research Design 44
Target Population 44
The Sample Size and Sampling Method 45
Data Collection Method and Procedures 46
Pilot study 47
Reliability and Validity 47
Data analysis 49
Ethical Considerations 52
Chapter summary 53
CHAPTER FOUR: RESULTS AND DISCUSSION 54
Introduction 54
Response Rate 54
Demographic Characteristics of Respondents 55

Descriptive Analysis 57
Technology-based Learning and Performance of Graffins College 57
Partnership in digital transformation and Performance of Graffins College 60
Innovation in digital transformation and Performance of Graffins College 63
Research and Development in digital transformation and Performance of Graffins College 66
The Performance of Graffins College 69
Diagnostic Tests 71
Normality Test 71
Linearity Test 72
Multicollinearity Test 74
Inferential Analysis 75
Correlation analysis 75
Technology-based Learning and Performance of Graffins College 77
Partnership in digital transformation and Performance of Graffins College 77
Innovation in digital transformation and Performance of Graffins College 78
Research and Development in digital transformation and Performance of Graffins College 79
Combined Digital Transformation Indicators and Performance of Graffins College 80
Test of Hypotheses 81
Test of Hypothesis One 81
Test of Hypothesis Two 85
Test of Hypothesis Three 89
Test of Hypothesis Four 93
Test of Hypothesis Five 96
Chapter Summary 99
CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS, AND AREAS FOR FURTHER RESEARCH 101
Introduction 101

Summary of Findings 101
Demographic Characteristics 101
Technology-based Learning in digital transformation and Performance of Graffins College 101
Partnership in digital transformation and Performance of Graffins College 102
Innovation in digital transformation and Performance of Graffins College 104
Research and Development in digital transformation and Performance of Graffins College 105
Combined Effects of Digital Transformation Indicators On Performance of Graffins College 107
Conclusions 108
Implications 112
Recommendations 113
Areas for Further Research 114
Chapter summary 115
REFERENCES 116
APPENDICES 125
Appendix I: Letter of Introduction 125
Appendix II: Informed Consent Form 126
Appendix III: Questionnaire 127
Appendix IV: Research Authorisation 132
Appendix V: Certificate of Ethical Clearance 133
Appendix VI: NACOSTI Permit 134
Appendix VII: Work plan 135
Appendix VIII: Budget 136

DEDICATION

I dedicate this study to the Almighty God, whose endless love and strength have carried me through the entire proposal journey. I give all the glory to Jesus Christ my Lord, for granting me the knowledge and wisdom to complete this thesis. His grace has sustained me throughout this academic journey. To my family both in South Korea and Kenya, I greatly appreciate for your support, especially your prayers and encouragement, which have been a source of strength and inspiration. May this study stand as a tribute to your faith in me and a testament to God's grace.

ACKNOWLEDGEMENT

First and foremost, I am also grateful to Pan African Christian University for providing me with the opportunity to pursue a Master of Business Administration (MBA) with specialisation in Strategic Management. I deeply appreciate my supervisors, Dr. Daniel Mulinge Nthenge and Dr. Beatrice Aluoch Oduor, for their practical guidance, generous feedback, and consistent support throughout the writing of this thesis. Your mentorship has been extremely valuable to the success of this work. I wish to express my heartfelt appreciation to my family for their unwavering love, support, and encouragement. Your belief in me has been a constant source of strength. I will never forget your enduring love, efforts, and prayers. I sincerely appreciate you all once again.

ABSTRACT

Digital transformation is an outstanding means of leveraging digital technology for improving the performance of higher education institutions. However, these institutions have faced continuous challenges as they pursue digital transformation while, in the previous researches reviewed, it was identified that the several research gaps addressed through this study were found. Thus, to understand and address these obstacles, this study aimed at generating empirical evidence about the influence of digital transformation on the performance of institutions of HEIs within Nairobi County, especially Graffins College, with particular emphasis on technology-based learning, partnership, innovation, research and development, and the combined effect of these four variables. The study was underpinned by the resource-based view theory, dynamic capability theory, and educational process reengineering theory. Using a positivist worldview, this study adopted explanatory case study as research design. A cross-sectional survey featuring stratified random sampling was used to target approximately 75 participants, including students, lecturers, and administrative staff from Graffins College. Data were collected using a structured 5-point Likert scale questionnaire, which underwent pretesting to ensure reliability and validity, and were analysed using SPSS version 29. Diagnostic tests, including normality, linearity, and multicollinearity, were conducted, followed by descriptive and inferential analyses. According to the results, all four variables of digital transformation (technology-based learning, partnership, innovation, as well as research and development) had a positive influence on the performance of Graffins College whereas the discrepancy between hard and soft digital infrastructure had also found. The impact was most pronounced when the variables were combined. Among the recommendations was that policymakers establish mechanisms for capacity-building to support the adoption of the digital transformation strategy and the 2025 digital initiatives established by the Kenyan government, to ensure educators and institutions can enhance their performance in terms of teaching quality and user satisfaction.

LIST OF TABLES

Table 1: A synthesis of research gaps 36

Table 2: Target Population and Sample Size by Category 46

Table 3: Results of Reliability Test 48

Table 4: Results of Validity Test 49

Table 5: Demographic Characteristics of Respondents 55

Table 6: Technology-based learning and Performance 57

Table 7: Partnership, collaboration, and Performance 60

Table 8: Innovation, creativity, and Performance 63

Table 9: Research and development and Performance 66

Table 10: Performance of Graffins College 69

Table 11: Normality Test 71

Table 12: Linearity Test 72

Table 13: Multicollinearity Test 74

Table 14: Correlation Analysis 75

Table 15: Model Summary for Technology-based learning 82

Table 16: ANOVA Model for Technology-based learning 82

Table 17: Coefficients Table for Technology-based Learning 83

Table 18: Model Summary for Partnership and Collaboration 85

Table 19: ANOVA Model for Partnership and Collaboration 86

Table 20: Coefficients Table for Partnership and Collaboration 87

Table 21: Model Summary for Innovation and Creativity 89

Table 22: ANOVA Model for Innovation and Creativity 90

Table 23: Coefficients Table for Innovation and Creativity 91

Table 24: Model Summary for Research and Development 93

Table 25: ANOVA Model for Research and Development 94

Table 26: Coefficients Table for Research and development 94

Table 27: Model Summary for Digital Transformation 96

Table 28: ANOVA Model for Digital Transformation 97

Table 29: Coefficients Table for Digital Transformation ……..... 98

LIST OF FIGURES

Figure 1: Conceptual Framework..... 39

Figure 2: Response rate 47

Figure 3: Linearity Test 73

ABBREVIATIONS AND ACRONYMS

BD:	Big Data
AI:	Artificial Intelligence
CC:	Cloud Computing
DT:	Digital Transformation
HEIs:	Higher Education Institutions
ICT:	Information and Communication Technologies
IoT	Internet of Things
IT:	Information Technology
LMS:	Learning Management System

OPERATIONAL DEFINITION OF TERMS

Digital Transformation	A comprehensive process that adopts digital technologies to improve teaching and learning skills, facilitate administrative tasks, and enhance overall institutional effectiveness (Hashim et al., 2021). In this research, digital transformation is measured by the following matrix: technology-based learning, partnership and collaboration, innovation and creativity, and research and development.
Higher Education Institutions (HEIs)	Postsecondary establishments that offer formal learning beyond secondary education, such as universities, colleges, and academic institutes (Maphalala& Adigun, 2020). In this research, a higher education institution within Nairobi County, particularly Graffins College, offers diploma and certificate programs.
Performance	Performance is defined as the ability of a production process to generate the best outcome with the minimum costs (Itzkowitz et al., 2023). In this study, performance is defined as the performance of higher education institutions in Nairobi, particularly Graffin College, in terms of academic service quality, administrative efficiency, learning environment and resources, and student satisfaction.

Information and Communication Technology (ICT)	The phase of utilising digital infrastructure consisting of networks, software, hardware, and other environments to activate the relationship between teachers and learners (Spielman et al., 2021). In this research, ICT is considered as digital technology, which is one of the key factors of digital infrastructure to facilitate the performance of Graffins College.
Internet of Things (IoT):	A framework providing the latest services and applications in daily objects connecting the offline and online worlds (Mouha, 2021). In this study, IoT is one of the key factors of independent variables, such as innovation and creativity.
Technical and Vocational Education and Training institutions (TVETs)	Technical and Vocational Education and Training institutions in Kenya contribute to provide competency-based, practical and industry-oriented skills training to learners in a bid to prepare them for employment, self-employment, and productivity in the labour market (Economic Survey, 2026).

CHAPTER ONE: INTRODUCTION AND BACKGROUND TO THE STUDY

This chapter is composed of the study background, problem statement, objectives, research questions, assumptions, justification, significance, scope, and limitations.

Background to the Study

Higher education is the cornerstone of today's society, especially with regard to preparing competent workers with the skills and knowledge needed to thrive in complex organisations. Institutions of higher learning can develop a competent workforce with a strong national and international competitive advantage successfully (Findler et al., 2019). Information technology (IT) is an important tool in this quest. IT has been adopted in various facets of human life and has become a defining feature of the 21st century, affecting sectors ranging from agriculture and business to education (Mpofu & Nicolaides, 2019). As digitalisation has prevailed, the future of the higher education sector in a digital age has become increasingly brighter. A major opportunity is that institutions of higher learning need to optimise digitalisation for effective strategic management. The importance of IT in higher education is now more evident than ever before.

Digitalisation in the educational realm refers to the strategic employment of digital technologies to replace manual and analogue tasks with automated processes, aimed at bolstering educational efficacy (Schmidt & Min, 2020). Such strategies rely heavily on a robust information communication technology (ICT) infrastructure, which encompasses wireless internet and a host of digital devices like computers, smartphones, and tablets (Van Der Vlies, 2020). Through research conducted in the United States (US), Benavides et al. (2022) established that digital transformation (DT) has significant organisational and socio-cultural impacts on HEIs. Digital

transformation maximises material distribution to users through various digital technologies. In the global context, and Europe, in particular, digital transformation is described as the adoption of collaborative digital techniques, such as learning management systems (LMS), e-libraries, and digital communication tools, to improve efficiency while delivering value to stakeholders (Habib, 2023). Even though DT has some positive impacts on organisational performance, the lack of learning spaces and low digital literacy has hindered some institutions from implementing it properly.

According to Hashim et al. (2021), institutions of higher learning, especially in the UK, have used DT to establish competitive actions in the higher education sector. Digitalisation strategies, cloud computing (CC), artificial intelligence (AI), internet of things (IoT), and big data (BD) have helped strengthen the competitive advantage of institutions of higher learning to expand educational opportunities in the world. Studies across different geographies, including Portugal (Sousa et al., 2020) and Italy (Cinquini & Mauro, 2023), have indicated the positive impacts of digitalisation on various dimensions of educational institutions, from cost efficiency and human resource management to student outcomes. These studies confirm that digital platforms allow for more effective sharing of educational resources, thereby optimising institutional performance. However, there has been concern about the high costs of digital transformation, especially with regard to installation and maintenance. Since digital transformation entails overall changes in institutions of higher learning, high costs are often unavoidable for sustainable management of organisational policies, instructional modality, personnel management, and instructor and learner development.

In the continental context, Langthaler and Bazafkan (2020) examined the effect of digitalisation on the higher education sector in Sub-Saharan Africa. After the

outbreak of the Coronavirus Disease of 2019 (COVID-19) pandemic, distance learning became essential in Africa. Digital transformation began in earnest in the education sector in order to resolve the limitations of Sub-Saharan Africa's education, such as ensuring far-reaching education distribution, while minimising time and place barriers and educational inequalities. However, a lack of sustainable ICT management and low digital literacy levels still prevent Sub-Saharan Africa from achieving proper and full digitalisation in the education sector.

In the national context, digital transformation is also ongoing in the Kenyan education sector, driven by policy initiatives from the Ministry of Education as well as other organizations belonging to the government, such as the Kenya Women Teachers Association (KEWOTA), Kenya ICT Action Network (KICTANet), African Centre for Women, Information and Communication Technology (ACWICT), and so on. Since the COVID-19 pandemic, Kenya has increased investments in digitalisation in the education sector, leading to an increased need for digital transformation over the years (Omondi et al., 2019). Due to the digital revolution, the government has facilitated e-infrastructure across the education sector to enhance efficiency and accessibility (Takamatsu et al., 2022). These initiatives underscore the need for HEIs to adopt effective digital transformation strategies to improve organisational performance, such as strategic planning, creating a competent corporate culture, improving research quality, and advancing education distribution (Barasa, 2021). Even though the Ministry of Education has focused on the establishment and development of digital transformation in the education sector (Kamau & Omwenga, 2025; Kibet, 2025; Odhiambo, 2025; Osoro & Mwikya, 2024), insufficient funding, costly digital infrastructure installation, and unstructured data management have

hindered institutions of higher learning from establishing digital transformation strategies.

Performance in higher education is not just a measure of academic achievements but also encapsulates the effectiveness of various institutional processes (Sarrico, 2022). Based on research conducted in the US, the performance of institutions of higher learning is defined as the extent to which a student, lecturer, and institution have achieved tangible or intangible educational goals (Blankenberger & Williams, 2020). According to the Baldrige Education Criteria for Performance Excellence Model, performance metrics can be evaluated across a seven-criteria framework, which includes leadership, strategy, customer satisfaction (i.e., student, stakeholder, and market focus), data analysis, workforce efficiency, operational effectiveness, and organisational outcomes (NIST, 2021). The performance of institutions of higher learning is a multi-dimensional construct that necessitates a balance between individual educational outcomes and broader systemic efficiency.

Digital Transformation

Digital transformation in education refers to a socio-technical process that uses digital technologies founded on a sound digital infrastructure to improve efficiency in educational provision (Gkrimpizi et al., 2023). Thus, a digital transformation strategy is meant to facilitate digitalisation throughout entire systems of institutions of higher learning for educational efficiency, productivity, resource distribution, and consumer satisfaction (Alnagrat et al., 2022; Sousa et al., 2020). This process is also understood as the utilisation of digital platforms so that participants can share education resources for maximum performance and efficiency (Cinquini & Mauro, 2023). Successful implementation ensures that digital tools are not merely added to existing systems but are fundamentally leveraged to redefine the quality and reach of higher education.

Digital transformation is founded on a strong ICT infrastructure that is made of the Internet, including wireless networks (like Wi-Fi), and digital gadgets (like desktop computers, laptops, smart-phones, and iPads) (Van Der Vlies, 2020). Digital transformation in institutions of higher learning plays a critical role in improving academic quality, enhancing operational efficiency, and strengthening overall institutional performance. Digital transformation can be measured by using multiple indicators, such as technology-based learning, partnership, innovation, and research and development. Together, these indicators demonstrate how deeply and effectively digital transformation has been embedded within an institution's core functions.

Technology-based learning has been categorised as online learning, blended learning, and mobile learning. Online learning, which also refers to distance learning, is defined as education that lecturers provide students with information or knowledge virtually (Singh & Thurman, 2019). Online learning focuses on a synchronous learning style in which two participants, that is, students and instructors, are interacting at the same time (Ferri et al., 2020). Blended Learning combines traditional classroom experiences with online elements (Rasheed et al., 2020), whereas mobile learning utilises portable devices for short, high-quality lessons (Chao, 2019). Each modality offers distinct pedagogical advantages suited to different learning contexts and student needs.

Partnership consists of multicultural communications and exchange programs that enhance the implementation of digital transformation within institutions of higher learning. Through this transformation, lecturers are able to interact with international students and establish global relationships through digital platforms without time and location barriers (Surahman et al., 2022). This intercultural competence enables positive synergy within institutions through collective intelligence. Exchange

programs allow students to study abroad at a specific educational institution (Chwialkowska, 2020). Digital transformation has expanded students' opportunities to connect to international education institutions through digital websites and webinars. Additionally, once their home institution has partnered with another global institution, other students have a better chance for similar exchange opportunities if they meet academic and financial conditions.

Innovation has been measured using digital literacy development regarding the proper use of generative artificial intelligence (AI), utilisation of cross-boundary digital technologies, and agile digital infrastructure establishment (Benavides et al., 2020). AI has emerged as a key tool to address challenges in conveying education in the post-COVID-19 pandemic era. It enables innovative teaching and learning styles for distributing educational content to international students, contributing to improved educational equity and quality, upgraded teaching capacities, and collaboration between human and digital domains. Cross-boundary digital technologies, such as IoT devices and Big Data, increase efficiency and productivity in education services (Zhang et al., 2022), while agile digital infrastructure, such as cloud computing and smart analytic tools, enables institutions to reduce costs and expand opportunities to provide international students with innovative education (Organisation for Economic Co-operation and Development [OECD], 2021).

Research and development consist of advanced teaching and learning experiences, prioritising capacity building and publications through digital transformation within institutions. Due to digital transformation, institutions are able to provide students with an upgraded quality of teaching, while the students can better understand the concepts efficiently (Benavides et al., 2020). Capacity building refers to a strategic approach to improving the quality of education in terms of teaching

skills (Mann et al., 2019). Through capacity-building combined with digital transformation, educators can develop their abilities across multiple dimensions of education, such as organisational policy, infrastructure re-investment, curriculum development, and community involvement. Digital transformation also contributes to diversified publications as it multiplies data supply and facilitates academic interactions (Segura et al., 2020). The current research focused on the aspect of digital infrastructure development, such as a portal on a website.

The Performance of Institutions of Higher learning

Performance of institutions of higher learning refers to the ability of their production processes to generate the best outcomes at minimum costs (Itzkowitz et al., 2023). It is made of return on investment, such as internal rate of return (from either private or social perspectives) (Cloete et al., 2018). Depending on resource management, this profitability can be differentiated. Sarrico (2020) also argues that "performance in higher education is about how well, by how much, and at what cost higher education is contributing to addressing the needs of society in terms of human capital formation, knowledge creation, and wider economic, social, cultural, and environmental development" (p. 2213). Thus, performance in institutions of higher learning can be defined as the extent to which stakeholders, such as students and lecturers, have fulfilled their goals in terms of organisational, social, and technological dimensions (OECD, 2022; Benavides et al., 2022).

According to Kenya's 2026 Economic Survey, it was reported that the country had 3,200 institutions of higher learning, including 74 universities, 67 teacher training colleges, and 3,126 Technical and Vocational Education and Training (TVET) institutions. Nairobi alone hosts 149 such institutions. As Kenya's socioeconomic conditions improve, the demand for private universities is escalating, necessitating

upgrades in educational services and curricula (Republic of Kenya, 2021). Institutions of higher learning have multiple stakeholders, such as students, lecturers, publishers, and governmental agencies (PAL Network, 2021).

For this study, performance was measured by the following matrix: academic service effectiveness, administrative efficiency, digital learning ecosystem performance, and customer satisfaction. First, academic service effectiveness plays a key role in determining the performance of institutions of higher learning. It consists of the quality of teaching, curriculum relevance, faculty expertise, and academic support systems. Institutions of higher learning that prioritise academic excellence tend to produce competent graduates and maintain higher levels of competitiveness, in terms of educational outcomes and brand image (Arokiasamy, 2021). Also, administrative efficiency can be defined as how effectively stakeholders adapt to the administrative system in which university processes are operated. Efficient administrative systems—with regard to student admissions, financial operations, and online class operations—can help improve the performance of institutions of higher learning (Mwangi & Gikunda, 2022). At institutions of higher learning, where resources must be maximised, well-organised digitalised operations can decrease unnecessary cost consumption and improve service delivery to both learners and faculty.

On the other hand, the digital learning ecosystem available to stakeholders could directly affect the quality of educational service. Digital learning ecosystem performance can be defined as the performance measured by digital learning environment, knowledge transfer support, and learners' capability to apply acquired knowledge in practical contexts (Al-Fraihat et al., 2020). A satisfactory environment, such as sufficient facilities and equipment, a well-organised ICT infrastructure, and

competent academic materials, can contribute to active learning and research productivity (Omollo &Otieno, 2023). Institutions of higher learning within Nairobi County are willing to invest in digital transformation—such as modern digital classrooms, virtual learning technologies, and online libraries—to foster both teaching excellence and student engagement.

Lastly, customer satisfaction is another vital indicator of how well institutions of higher learning meet student needs (Karanja & Mutua, 2020). It includes aspects of teaching quality, academic services, campus life, such as club activities and relationships between stakeholders, and administrative support. The higher satisfaction levels are, the better the academic performance, student enrollment, and brand loyalty, which contribute to the success of the institutions. In the context of Nairobi's institutions of higher learning, students increasingly expect a digital experience—from virtual administrative processes, such as online admission and course registration, to online learning environments, such as LMS. The expected results of adopting digital transformation in institutions include improved loyalty, enhanced innovation in service delivery, and the development of a creative organisational culture that supports sustainable development (Oanda, 2022).

The Context of the Study: Graffins College

According to Kenya's 2026 Economic Survey, it says that 2,401 private Technical and Vocational Colleges out of 3,200 HEIs were reported. It means that private Technical and Vocational Colleges have accounted for significant role in institutions of higher learning. Also, based on the finding of the previous studies, it says that digital learning has strong relation to the performance of TVETs in Kenya regarding its institutional performance (Cheruiyot, 2024; Irungu, 2025; Omutange et al., 2025). Graffins College, located in Westlands, Nairobi, is one of the long-

established private Technical and Vocational Colleges offering professional and technical training with a strong focus on Information Technology, Business, and Language, especially English. Over 50 years ago, the college was established to provide hands-on training to foster effective leaders, especially in the industry. It also collaborates with both local and international examination bodies, such as Pearson (UK) and ICDL, to offer globally recognised certifications. Through digital transformation, it can be said that the performance of Graffins College has improved in terms of quality of teaching and learning, international student enrolment, and competence, so that it was the preferred subject of study to examine the influence of digital transformation on the performance of institutions of higher learning within Nairobi County.

In recent years, Graffins College has been at the forefront of embracing digital transformation within Nairobi's higher education landscape. The institution has operated various digital tools and platforms to improve the quality of learning, teaching, and administrative services. These include a learning management system (LMS), virtual classrooms, and research data systems based on Big Data to support both online and blended learning modes. The college also enhances innovation in e-learning by adopting the latest digital transformation strategies suggested by the government policy 2025. These initiatives reflect Graffins College's strategic commitment to leveraging digital transformation strategies for improved overall performance of the institution.

Given its strong orientation toward digital integration and performance-driven education, Graffins College provides a relevant and practical case for this study. Because institutions of higher learning within Nairobi county have faced increasing challenges with digital transformation—such as low digital literacy, insufficient

infrastructure, digital divide, and non-inclusion—understanding how digital transformation is being implemented and measuring the effect is vital. This case study of Graffins College offers valuable insights into the relationship between digital transformation and institutional performance in the context of institutions of higher learning within Nairobi County, Kenya.

Compared to other tertiary colleges in Nairobi, based on the data from e-portal and news, Graffins College has already established digital transformation regarding hard digital transformation such as online learning, digital learning platforms, ICT labs, and online assessment system. While Graffins College has actually implemented digital transformation, it has received less attention in existing research, making it a valuable context for examination. Hence, in order to avoid duplicated findings with the previous studies without less generalizability, the researcher decided Graffins College as the case study site.

Statement of the Problem

Digital transformation is a natural response to current changes in society, especially in education. In post-COVID-19 times, digital transformation has been much more necessary for institutions of higher learning to provide learners with education virtually through online learning platform. However, the challenges of operating it within the institutes have been found that they should deal with in a bid to maximize the effects of digital transformation and understand its genuinity, that is an expansion of collective wisdom into application of knowlegment for their own works. Given the micro-economic crisis, the education sector in Kenya seems to face high risks, and institutions of higher learning must look for solutions (World Economic Forum, 2023). Digital technologies are highly likely to be a solution to varying challenges in Kenya's education system by evoking significant benefits, such as

increased student enrolment, globalisation of education supply, and better educational performance (Barasa, 2021).

Even though interest in digital transformation has increased due to its far-reaching benefits, there have been challenges such as a lack of resources, poor attitudes towards digital adoption, insufficient sustainable management, and a lack of adaptability (Kenya National Bureau of Statistics, 2023). Throughout the country, the installation of digital infrastructure has required high costs. The poor distribution of digital education among users, who include both lecturers and students, has also prevented some institutions from utilising digital transformation (The World Bank, 2019). These systemic barriers have created a digital divide that limits the equitable distribution of educational resources and slows the overall pace of institutional modernisation.

Furthermore, there have been inconsistencies in past research regarding the definition and measurement of digital transformation adopted in institutions of higher learning. In a global context, Karabatak and Alanoglu (2021) conducted a study on the effect of digitalisation on educational performance in Turkey. The qualitative research focused on whether hardware and software infrastructure transformations affected the performance of the Ministry of National Education (MoNE). Even though the findings suggested that digitalisation has positive effects on the performance of the organisation, regarding empirical gap, it did not provide statistical evidence to explain how it works within the organisation. The current study addresses this gap by examining how digital transformation contributes to the performance of institutions of higher learning within Nairobi County.

Singh (2022) conducted a study on the state of digitalisation in the education sector. The research was conducted in two countries, India and the USA, to compare

their benefits and challenges globally while adopting the quantitative data collection method, including document review. However, regarding the conceptual gap, this study failed to find out how soft digital transformation, such as capacity-building program and training for digital literacy development, has an impact to the performance of the institutes. Therefore, to fill this gap, the current study investigated the wider aspects of the influence of digital transformation on the performance of institutions of higher learning in Nairobi, Kenya.

In the Republic of Cyprus, Timotheou et al. (2022) examined whether digital transformation strategy affects performance in education. The study dealt with a wide range of contexts, from pre-school to higher education, using a non-systematic literature review with the meta-analysis method. The researchers found out that digital transformation influences education performance with regard to stakeholders, which are students, teachers, administrators, and parents. However, concerning empirical gap, the study comprised a literature review of educational performance rather than empirical data from institutions of higher learning, meaning that there was a physical evidence through the field work in order to verify the finding. To fill this research gap, this study provides statistical findings demonstrating that digital transformation influences the performance of institutions of higher learning in Nairobi County, Kenya.

Nationally, a study conducted by Zeleza & Okanda (2021) described the effect of digital transformation strategy on African Universities. The research adopted a descriptive research design to investigate the relationship between digital transformation and African universities, within their background. The findings indicated that the establishment of digital capacities and high-performance computing (HPC) infrastructures is a key factor in coping with development and challenges in

today's society, not only in African Universities but also in demographic, economic, ecological, political, and social domains. However, regarding methodological gap, this research focused on literature review, and primarily relied on secondary scientific findings. To fill this gap, this quantitative study investigated whether digital transformation affected the performance of institutions of higher education within Nairobi County.

Getuno (2022) evaluated whether digital transformation contributed to academic performance in HEIs in Kenya. The study was conducted at Egerton University using a mixed-method approach. The findings showed that there is a need to build capacity and change management to develop the digital ability of academic staff, who do not have confidence to utilise digital infrastructure and facilities in teaching. The study also revealed limitations in the lack of integrated digital transformation strategies and limited ICT adoption by faculty in Kenyan higher education. However, the contextual gap was found that the study focused on private university in Kenya. Hence, this study fills this gap by examining ICT adoption and its impact on institutional outcomes in institutions of higher learning.

Riany et al. (2025) used a mixed-methods approach to analyse e-readiness and e-learning integration in Kenyan universities using the unified theory of acceptance and use of technology. The researchers found that e-learning had a positive influence on educational performance. At the same time, there was a conceptual gap in that the study focused on the impact of the limited area of digital transformation, that is, technology-based learning, with respondents limited only to students and faculty. This study, therefore, involved a quantitative survey with a wider range of respondents, which consisted of students, faculty, and administrative staff, in order to investigate

the influence of wider aspects of digital transformation, including technology-based learning, partnership, innovation, and research and development.

Against this backdrop, this study examined the relationship between digital transformation and the performance of institutions of higher learning in Nairobi County, Kenya. This was achieved by using Graffins College, located in Westlands, Nairobi, as a case study. This study shed light on whether higher education institutions in Nairobi are in sync with digital advances and whether this is generating a measurable difference in terms of the performance of learners and institutional service delivery.

Objectives of the study

General Objective

The general goal of this study was to evaluate the influence of digital transformation on the performance of institutions of higher learning within Nairobi County, Kenya.

Specific Objectives

The specific objectives were as follows;

1. To explore the influence of technology-based learning in digital transformation on the performance of Graffins College
2. To determine the effects of partnership in digital transformation on the performance of Graffins College
3. To examine the effects of innovation in digital transformation on the performance of Graffins College
4. To establish the influence of research and development in digital transformation on the performance of Graffins College

5. To evaluate the combined effects of technology-based learning, partnership, innovation, and research and development in digital transformation on the performance of Graffins College.

Hypotheses

H_{01} Technology-based learning in digital transformation does not have any effects on the performance of Graffins College.

H_{02} Partnership in digital transformation have no effect on the performance of Graffins College.

H_{03} Innovation in digital transformation have no influence on the performance of Graffins College.

H_{04} Research and development in digital transformation does not influence the performance of Graffins College.

H_{05} The combined effects of technology-based learning, partnership, innovation, and research and development in digital transformation have no effect on the performance of Graffins College

Assumptions of the study

The study was conducted on the basis of several key assumptions that were foundational to the research process and the subsequent interpretation of the data. Firstly, it was presumed that the questionnaire respondents provided honest and thoughtful answers. Secondly, it was assumed that respondents were willing to participate in research activities, including questionnaires. Willing participation was vital for ensuring that the collected data was representative and robust, thereby providing a solid foundation for analysis and conclusions. Thirdly, it was assumed that no respondent felt compelled to disclose private or sensitive information. This aligned with ethical research standards that prioritised the privacy and confidentiality

of all participants. Additionally, it was assumed that the research environment was conducive to candid responses and open dialogue, which in turn enhanced the quality and reliability of data. Lastly, it was assumed that respondents had the liberty to abstain from answering any questions they found uncomfortable or irrelevant. This ensured ethical flexibility and respondent autonomy, contributing to a more ethically sound and inclusive research process.

Justification of the Study

The increasing demand for performance in institutions of higher learning within Nairobi has necessitated digital transformation to enhance efficiency, competitiveness, and responsiveness to student needs. However, despite substantial investment in digital infrastructure and gadgets, there has been limited empirical evidence demonstrating the relationship between digital transformation and performance in tertiary colleges within Nairobi County. Most past papers focused on public or private universities, leaving a gap in context-specific insights for HIEs (Kumi-Yeboah et al., 2023). By focusing on Graffins College, one of the leading institutions of higher learning in Nairobi, this study would generate timely and relevant insights into how digital transformation affected the performance of tertiary colleges in Nairobi. The findings would also influence decisions by policymakers, educational leaders, and other stakeholders towards improving digitalisation tactics and educational policies, both at the institutional level and, more widely, throughout the Kenyan education sector. In addition, through an analysis of the real-world effects of these diverse digital learning platforms on academic achievement, this study aimed to offer practical insights towards enhancing instructional strategies, resource distribution, and ultimately, student outcomes (Timperio et al.,2022). Moreover, the study was timely, given the global shift towards remote learning to overcome

challenges such as the digital divide, non-inclusion, and lack of sufficient digital infrastructure. Understanding the efficacy of digital learning platforms would also help institutions to prepare for future disruptions, thereby enhancing their resilience and agility. Finally, the findings would serve as a reference point for similar educational institutions within Nairobi County, Kenya, and other developing countries facing comparable challenges and opportunities in digital transformation.

Significance of the Study

The significance of this research was manifold. For one, identifying the challenges that the participants are struggling with would contribute to Graffins College in terms of educational performance. The insights would enable its leadership and educators to design more targeted support systems, refine its programs, and address gaps that may be quietly hindering student potential. Second, assessing different forms of digital learning on educational outcomes would provide empirical evidence that would guide educators in establishing effective digital transformation (Viberg et al., 2020). Furthermore, the findings would help various stakeholders involved in the higher education landscape in Kenya to establish innovative strategies to improve performance. Beyond the instructional level, the study would contribute to scholarship by offering meaningful input into existing theories and studies on the intersection of digital transformation and institutions of higher learning. By highlighting what works and what does not in the context of Graffins College, this study would influence digital education policy development not just within Nairobi but potentially serve as a model for similar economies. Lastly, the study was significant in light of recent global trends, which have stimulated change to digital learning platforms, by supporting the development of effective digital education strategies in order to establish more elastic and adaptable educational systems, ready to face future challenges.

Scope of the Study

The scope of this study was carefully defined to provide a comprehensive understanding of how digital transformation influenced the performance of institutions of higher learning within Nairobi County, Kenya. This study consisted of two variables, namely digital transformation and performance of institution of higher learning, especially Graffins College. For each variable, there were sub-variables such as technology-based learning, partnership, innovation, and research and development for digital transformation and academic service quality, administrative efficiency, learning environment and resources, and student satisfaction for performance of institutions of higher learning. This study was underpinned by three relevant theories: the Resource-Based View (RBV), Dynamic Capabilities, and Educational Process Reengineering (EPR) (Ghosh et al., 2022; Meteshkin et al., 2021; Sanders & Wong, 2020). While the population of the study consisted of institutions of higher learning within Nairobi County, Graffins College was purposively selected as the sample for this study.

Limitations and Delimitations of the Study

This study faced several limitations. The research focused exclusively on Graffins College, located in Westlands, Nairobi, which, while offering a deep-dive analysis, also meant that the findings might not sufficiently represent entire institutions of higher learning within Nairobi or, more broadly, in Kenya or other parts of the world. The study also had a periodical limitation that the semester for business courses ended in September, so that the respondents were limited to the departments of ICT and languages, which were the only ones in session at the time of data collection. Another limitation was that the survey was conducted over a relatively short period of time: one week. Additionally, the study largely relied on self-reported data from students, which may have been influenced by personal biases

or misunderstandings of questions. There was also a language barrier between the researcher and international students, who were not proficient in English. Lastly, the rapidly evolving nature of digital technologies meant the findings could become outdated if not interpreted in the current technological context.

In terms of delimitations, the study's focus was purposefully restricted to certain types of digital learning—online learning, mobile learning, and blended learning—because there were other emerging technologies and methods, such as adaptive learning platforms, gamified learning, and virtual reality educational experiences (Almeida & Simoes, 2019). This decision was made to keep the research focus sharp, but it did limit the comprehensiveness of the analysis. Also, the financial aspects of digital transformation were not investigated, such as return on investment for the institutions or cost-effectiveness for students. Rather, this study focused on educational outcomes as the primary measure of performance (Appels et al., 2022). Lastly, the practical applications may have been more immediately useful for administrators and educators who were directly involved in digital transformation at Graffins College or similar institutions. By acknowledging these limitations and delimitations, this study could provide a transparent framework within which the research findings could be evaluated, thereby enhancing validity and reliability.

Chapter Summary

This chapter introduced the research aim, which was to investigate the influence of digital transformation on the performance of institutions of higher learning, specifically at Graffins College within Nairobi County. This study was grounded in the increasing relevance of digital techniques in education. Yet, successful implementation was hindered by the significant research gap in the context of institutions of higher learning within Nairobi County, Kenya. This chapter outlined

the problem statement and set forth both general and specific objectives, along with the research questions aimed at exploring various dimensions of digital learning. It offered a strong rationale for the study, highlighting its potential contributions to educators, administrators, and policymakers. Also clarified are the scope, timelines, and sample selection techniques while acknowledging the limitations and potential challenges. Overall, it served as a roadmap for the upcoming study.

CHAPTER TWO: LITERATURE REVIEW

Introduction

A literature review is a synthesis of existing academic resources on a particular research topic (Janeesh et al., 2019). A literature review also seeks to enhance understanding of the theoretical aspects and ideas related to a specific concept (Creswell & Creswell, 2018). Since it helps researchers to comprehend the relationship between variables, it needs to be comprehensive (Lame, 2019). This literature review synthesised existing empirical studies about the influence of digital transformation on the performance of institutions of higher education in Nairobi. Also presented is a theoretical framework (fundamental theories) and a conceptual framework to demonstrate the relationships between research variables. Lastly, the synthesis identified the literature gaps this study sought to fill.

Empirical literature reviews

An empirical literature reviews examines previous studies that present data-based findings on a topic (Creswell & Creswell, 2018). It summarises research methods, data collection, and results from primary studies. In this review, the quality of evidence, data patterns, or gaps in research were also evaluated. Such a thorough review is essential for supporting evidence-based practice and guiding future investigations (Linnenluecke et al., 2019).

Digital Transformation

Hatos (2019) investigated the effect of digitalisation on education in Romania from the perspective of sociology. The research showed how digitalisation worked overall in the education sector in the phase of causal mechanisms, second-order, multiple-order, and international digital divides. Focusing on ICT, digitalisation

influenced the performance of education institutions differently according to the sociological conditions. Based on the finding, it could be understood that the operation process of digitalization, regarding conveying the digital learning, was multiconnected in the various contexts and functioned as strategic development for its performance. However, the study lacked empirical insights because it was purely a literature review. Hence, this research needed to fill the gap through quantitative data on the relationship between research variables.

Another study by Kuzu (2020) used a qualitative research method to investigate how digital transformation operates within universities in Turkey. According to the findings, digital transformation had positive effects on the performance of universities with regard to education, research, social service, operations, and management. Even though the research succeeded in identifying the significance of digitalisation across the higher education sector, it also had limitations, specifically the lack of quantitative findings and insufficient consideration of social and policy factors influencing digital transformation in private universities. To address these drawbacks, the current quantitative study was designed to identify the social and policy elements of digital transformation affecting HEIs in Nairobi.

The Indicators of a Digital Transformation Strategy

Understanding the indicators of digital transformation strategy within higher education, from technology-based learning, partnership, innovation, and research and development, is essential. These dimensions collectively shape an institution's capacity to adapt, compete, and deliver meaningful learning outcomes in an increasingly digital and knowledge-driven global landscape. The following section describes these indicators of digital transformation strategy.

Technology-based Learning and Performance of Institutions of higher learning

Al-Taweel et al. (2020) conducted a study examining how technology-based learning affected the performance of the University of Dental Medicine in Iraq during the COVID-19 pandemic. The research revealed that dental students had a positive attitude and a low-to-moderate level of satisfaction with technology-based learning. Even though technology-based learning was less effective in helping students gain expertise in practicum, there was a positive opinion about it regarding the distribution of teaching services and communication with lecturers during the pandemic. However, due to lack of digital literacy level of the respondents (more than 50% of themt have less technology-based learning experience), it might be difficult to clarify the value of the finding. To fill this gap, the current study selected Graffins College, where the digital transformation has been already established and the literacy level of the users were comparatively high, and investigated how more diverse aspects of digital transformation, including technology-based learning, influence the performance of institutions of higher learning in Nairobi.

Mulyadi et al. (2021) completed a meta-analysis to investigate the impact of simulation technology-based learning on Taiwan nursing students' learning outcomes. The findings revealed that technology-based learning enhanced the performance of undergraduate students in terms of clinical practice by filling the gap between theoretical and practical phases. Even though the research had quantitative findings, the considerable heterogeneity in simulation approaches and outcome measures, combined with limited populations and settings, affected generalizability across nursing education contexts. To fill this research gap, the current study employed a standardised simulation framework and a large sample to enhance methodological consistency and generalizability.

Omutange et al. (2025) conducted a descriptive and explanatory study on the impact of integrating modern digital technology platforms in teaching and learning in Technical and Vocational Education and Training (TVETs) in Kenya. The research revealed that digital technology platforms positively contributed to TVET performance. However, in terms of the conceptual gap, the research focused on the independent variable, specifically technology-based learning, meaning that it might be too simple to delve into how the organizational performance involving both internal and external.environmental factors can be able to be developed. To fill this gap, the current study focused on how diverse aspects of digital transformation, technology-based learning, partnership, innovation, and research and development influence the performance of institutions of higher learning in Nairobi County.

Partnership and Performance of Institutions of higher learning

Demartini et al. (2020) conducted qualitative research to investigate how digital transformation works within the 'Riconnessioni' project in Italy. This was an initiative specifically designed to advance digital transformation strategy and address the evolving needs of institutional stakeholders across Italian colleges. The findings revealed that the project yielded significant benefits for users across several dimensions, including enhanced collaboration through digital technologies, the establishment of robust digital infrastructure, strengthened teaching competencies, and improved accessibility to enriched learning content. Not withstanding these contributions, the study was limited by the absence of quantitative evidence, constraining the ability to empirically establish the relationships between the key research variables. The present study sought to address this methodological gap by employing a quantitative approach to generate measurable and statistically grounded insights into the research topic.

Khamis et al. (2021) conducted a case study to examine the innovative and collaborative effects of online learning and work-based higher education systems and processes in Pakistan and East Africa during the COVID-19 pandemic. According to the study's findings, coalitions among digital systems and processes within HEIs ensured the provision of prolonged educational opportunities to students and efficient resource management throughout the pandemic. However, the research was limited by reliance on a literature review to assess the status of digital transformation strategies adopted in HEIs in Pakistan and East Africa so that the specific strengths, limitations, and challenges through which the institutes are able to be converted into being innovative regarding its adoption of digital initiatives could not be examined. To address this gap, the present study employed a quantitative research design to obtain statistically grounded evidence.

Irungu (2025) conducted a case study at Nyandarua National Polytechnic. Fewer than an average number of respondents agreed with the positive influence of digital technology on workforce readiness within the institution, while also revealing the persistence of continuous challenges. It, however, was limited to the area of digital technology, which was the sole independent variable of the research. To address this conceptual gap, the present study conducted a case study at Graffins College, a tertiary college within Nairobi County, to examine whether digital transformation strategy positively influenced institutional performance across technology-based learning, partnership, innovation, research and development, and the combined effect of these dimensions.

Innovation and Performance of Institutions of higher learning

Chen and Roldan (2021) conducted a qualitative case study to examine how challenges were transformed into opportunities through digital innovation during the

COVID-19 pandemic at San Jose State University in California. Based on the research's findings, Innovation Farm (IF), which is based on an AI system, worked effectively to address emerging challenges by delivering virtual education services to students during the COVID-19 pandemic while simultaneously expanding opportunities to enrich the knowledge curriculum. However, this research focused on qualitative research of the research topic. To fill this gap, the present study employed a quantitative case study approach to collect numerical data and statistically evaluate the relationships between the identified variables.

Ali and Nyamboga (2020) carried out research to investigate how far the e-learning mode of delivery affects the academic performance of the private university sector in Kenya. The researchers adopted a quantitative research design to examine the relationship between the e-learning system grounded in innovative digital infrastructure and academic performance at Umma University's Garissa Campus. Innovative digital infrastructure had positive impacts on academic performance in terms of affordability, accessibility, and efficiency, while there was an issue with the electricity supply during the class. However, the study was limited by its narrow focus on a single dependent sub-variable, which constrained the comprehensiveness of its conclusions. To address this gap, the present study examined four dependent variables in order to more comprehensively explore the multifaceted impact of digital transformation on the performance of institutions of higher learning within Nairobi.

Kamau and Omwenga (2025) employed a semi-structured questionnaire to examine the relationship between digitalisation and service delivery within the Ministry of ICT and Digital Economy in Kenya. The study revealed that digitalisation enhanced service efficiency, while also identifying persistent challenges with regard to infrastructure resilience, financial security, and user training. To fill these gaps, this

study conducted a descriptive survey to figure out the influence of digital transformation on the performance of Graffins College, which is one of the tertiary colleges in Nairobi.

Research and Development and Performance of HEIs

Farias-Gaytán et al. (2021) sought to identify the effects of digitalisation on digital literacy in HEIs worldwide. The study adopted the systematic literature review methodology to address the scope of digitalisation strategy within the world's higher education sector. Digital transformation was found to enhance the performance and development of HEIs in terms of customer satisfaction and mutual culture establishment. Even though the research figured out the prevailing tendency in digitalisation strategy and digital literacy in HEIs, it was limited by its predominant reliance on literature review-based evidence. To fill this methodological gap, the present study employed a quantitative research method to obtain empirically grounded evidence on the research topic.

Odhiambo (2025) carried out qualitative research to evaluate Kenya’s National Digital Master Plan (NDMP, 2022-2032). Based on the findings, it can be said that digital transformation had positive impacts not only on the education sector in Kenya but also on the economy, indicating that it was key to improving overall performance in Kenya. However, the study also identified persistent challenges spanning several dimensions, including digital infrastructure and ethical issues such as non-inclusion, digital divide, and unethical use of technology. To fill these gaps, the present study adopted survey design to investigate the implementation of digital transformation at Graffins College and to explore potential remedies to the challenges identified in the existing literature.

Performance of Institutions of Higher Learning

The empirical literature on the performance of institutions of higher learning identifies various factors that affect institutional outcomes, including academic quality, research productivity, student satisfaction, financial efficiency, and societal impact. Key studies highlighted that performance was influenced by governance structures, funding models, leadership quality, and stakeholder engagement (Ochola et al., 2024; Ingosi et al., 2024; Mukenye et al., 2025; Kagwe, 2025). The literature emphasised that autonomy, strategic management, and resource allocation significantly enhance institutional effectiveness. Additionally, the rising adoption of performance-based funding alongside quality assurance frameworks has proven effective in strengthening accountability and optimising outcomes. However, challenges such as limited funding, unequal access, and an imbalance between teaching and research priorities remained critical concerns. Metrics such as academic service quality, administrative efficiency, learning environment, and student satisfaction with resources were commonly used to assess the performance of institutions of higher learning.

Academic Service Effectiveness

Costa et al. (2023) conducted a qualitative study to identify the relationship between student engagement and the development of higher education models, specifically examining a Comprehensive Student Engagement Plan within a public university in Portugal, a South European country. The findings revealed that the student engagement plan positively improved the overall culture of student participation, thereby contributing to the development of academic service quality. However, the study was limited by the absence of quantitative research findings. To

address this gap, the present study employed a quantitative case study design to generate empirical evidence for examining the research topic.

Maingi (2020) carried out a qualitative case study to examine Kenya's tourism education management in relation to sustainable development. The findings demonstrated that mainstream tourism education contributed to the sustainable growth of Kenya's tourism sector. However, the study did not provide quantitative evidence on how digital transformation influences the performance of institutions of higher learning and was further constrained by a limited sample scope that focused exclusively on the tourism discipline. To address these research gaps, the present study adopted a quantitative case study design with a broader sample scope, encompassing all departments of Graffins College.

Administrative Efficiency

Cosenz (2022) adopted a quantitative literature review design to examine performance management systems in HEIs within Italy. The findings revealed that performance management systems were capable of effectively measuring the performance of HEIs in relation to sustainable development. Although the study examined how HEIs contributed to society in terms of regional improvement, employment, and economic prosperity, it failed to provide empirical evidence on how digital transformation strategy influences the efficiency of institutions of higher learning. To address this gap, the present study was a quantitative case study aimed at generating empirical findings on how digital transformation influences the performance of institutions of higher learning in Nairobi.

Mbote (2019) conducted a quantitative study to investigate the drivers of performance excellence in Kenyan Universities, employing a descriptive survey design to identify the key indicators of performance excellence within the sector. The

findings revealed that performance in Kenyan universities could be measured using several major indicators, including leadership, student satisfaction, performance excellence, process management, partnership and resource management, policy and strategy, and internationalisation. However, the study was limited in scope as it focused exclusively on public universities in Kenya. To address this gap, the present study conducted a quantitative case study to generate empirical findings examining how digital transformation influences the performance of institutions of higher learning in Nairobi, Kenya.

Digital Learning Ecosystem Performance

Bianchi and Caperchione (2022) carried out a literature review on performance evaluation and governance in public HEIs. They examined associated challenges and opportunities within European countries. The findings revealed that the performance of higher education institutions can be measured by accountability, transparency, and competitiveness as key dimensions of sustainable development. However, the study was limited by the lack of empirical evidence to substantiate the identified challenges and opportunities in the performance of European public universities. The study also failed to examine how digital transformation influences student enrolment levels. To address these gaps, the present study employed a quantitative case study design, using Graffins College, a representative institutions of higher learning within Nairobi, as its unit of analysis.

Paladan (2018) conducted a study to investigate the effects of digital and social media marketing on the performance of HEIs within Asia and Africa. Adopting a quantitative descriptive research design, the study examined how digital transformation strategy influenced HEIs in terms of marketing within both the Asian and African contexts. The findings revealed that social media platforms such as

Facebook, YouTube, and Twitter contributed positively to institutional efficiency in terms of cost management and the distribution of education. However, the study was constrained by its narrow conceptualisation of the independent variable, focusing exclusively on digital marketing dimensions such as websites and social networking sites (SNS). To address this gap, the present study adopted a quantitative case study design encompassing a broader range of independent variables, namely technology-based learning, partnership, innovation, and research and development.

Customer Satisfaction

Pokrovskaia et al. (2019) undertook a study to investigate customer satisfaction at St. Petersburg universities in relation to educational services that contribute to intellectual capital development and the enhancement of a knowledge-sharing culture. Employing a descriptive research design, the study assessed education quality and processes, student enrolment rates, graduate employment status, and service distribution. Although the findings revealed the key factors influencing customer satisfaction among stakeholders, including shareholders, faculty, and students at St. Petersburg universities, the study failed to identify the causal relationship between digital transformation and institutions of higher learning in Nairobi County. To address this gap, the present study employed a explanatory case study design to examine the influence of digital transformation on institutions of higher learning in Nairobi.

Kiriri (2022) carried out a mixed-methods study to investigate the management of performance in HEIs within Nairobi. The findings demonstrated that the Balanced Scorecard (BSC), which is a widely recognised framework for measuring performance excellence across both tangible and intangible resources, was effective in assessing organisational performance across dimensions such as finance,

stakeholder engagement, processes, resource availability, and research and development within Nairobi's HEIs. However, the study predominantly relied on secondary data from existing literature while failing to empirically examine how digital transformation influences the performance of institutions of higher learning through quantitative evidence. To address this gap, the present study employed a quantitative case study design to examine the influence of digital transformation on the performance of institutions of higher learning in Nairobi.

Theoretical Literature Review

This study was grounded on three key theories: resource-based view (RBV), dynamic capability theory (DCT), and educational process reengineering (EPR) theory. Each theory provided a distinct lens through which the variables of digital transformation and college's performance were examined.

Resource-Based View (RBV) Theory

The RBV theory, originally introduced by Penrose (1959) and further developed by Prahalad and Hamel (1990), posits that the superiority of an organisation's resources and its capacity for strategic adaptability are fundamental determinants of its competitive advantage (Seriki, 2020; Iruthayasamy, 2021). In the context of HEIs, RBV highlights the importance of technological assets—such as IT infrastructure, human IT capabilities, and the configurability of digital resources—as strategic assets that can distinguish an institution from its competitors (Gerhart & Feng, 2021; Shahbaz et al., 2018). These resources, being unique and difficult to replicate, form the basis upon which universities can develop robust digital transformation strategies that ultimately enhance their institutional performance.

In this study, the RBV served as the theoretical foundation for analysing how the digital transformation of Graffins College influenced its overall performance

outcomes. The theory suggests that the effectiveness of digital transformation depends largely on the quality and strategic management of these IT resources. Specifically, IT capabilities serve as independent variables, representing the tangible and intangible digital assets that enabled innovation in teaching, institutional administration, and research. Through the lens of RBV, the study examined the direct impact of these digital resources on operational efficiency, educational quality, and competitive positioning, thereby generating innovative ideas on how Graffins College can leverage its digital resources to achieve superior performance.

Dynamic Capability Theory (DCT)

The DCT was conceptualised by Teece (2018) and builds on the traditional resource-based view by highlighting an institution's capacity to detect, adapt to, and reconfigure both internal and external strategic competencies in response to rapidly changing environments, ultimately aiming to improve organisational performance. (Božič & Dimovski, 2019; Ghosh et al., 2022). This theory is particularly applicable to the context of digital transformation, where higher education institutions face continuous technological disruptions and shifting stakeholder expectations. DCT is explained by the following three core processes: sensing opportunities and challenges, leveraging resources to take advantage of opportunities, and restructuring organisational processes and capabilities to sustain competitive advantage (Nayal et al., 2021). These dynamic capabilities enable institutions to respond proactively to environmental changes, thereby maintaining relevance and improving performance.

The DCT also served as a key theoretical framework for this study. It explained that an institution, Graffins College, for this purpose, possessed the crucial ability to adapt, integrate, and reconfigure digital technology both within and beyond the organisation, thereby enhancing its performance in reaction to rapidly changing

environments. In the context of digital transformation, this theory provided a lens through which to examine how Graffins College identified digital opportunities (sensing), mobilised resources to exploit them (seizing), and restructured institutional processes to keep a competitive advantage. By applying this framework, it was possible to explore how dynamic capabilities enabled institutions of higher learning to effectively implement digital initiatives and, in turn, improve performance metrics, such as academic excellence, operational efficiency, and student satisfaction.

Educational Process Reengineering (EPR) Theory

Educational process reengineering (EPR) theory, derived from Business Process Reengineering principles introduced by Hammer and Champy (1993), focuses on fundamentally redesigning educational processes to enhance their efficiency and effectiveness (Wang & Liu, 2021). EPR theory advocates for a systematic approach that involves analysing existing processes, redesigning workflows, and leveraging digital techniques to transform academic and administrative systems. In the context of institutions of higher learning, this theory emphasises the need to modernise curriculum design, teaching methodologies, and evaluation protocols through digital integration, thus enabling institutions to adapt to the latest educational demands and resource constraints (Pasaribu et al., 2021).

In the case of Graffins College, EPR theory informed the process-oriented variables related to digital transformation, such as curriculum renewal facilitated by LMS and the adoption of innovative virtual teaching practices optimised by ICT. By reengineering these educational processes, the institution could satisfy the needs required: academic excellence, graduate competencies, and labour market requirements, while enhancing the quality of education. This theory emphasised how the redesign of core academic processes, facilitated by digital transformation, directly

impacted key performance indicators, such as student satisfaction, the quality of learning services, administrative efficiency, and the relevance of higher education in Kenya (Maobe & Peng, 2020). Consequently, EPR provided a crucial lens for understanding how Graffins' College's digital transformation can result in sustainable development through systematic process innovation.

A Synthesis of Research Gaps

Significant literature gaps were identified across the majority of previous papers, particularly the lack of quantitative empirical evidence on how digital transformation has influenced the performance of institutions of higher learning in Nairobi County. Table 2.1 summarises the research gaps identified in the reviewed studies.

Table 1

A Synthesis of Research Gaps

Researcher(s)	Title of Study	Key Findings	Key Research Gaps	How the Current Study Addresses the Gaps
Hatos (2019)	*The Impact of Digitalization on Educational Achievement: A Literature Review from a Sociological Perspective*	Digital transformation strategy in the education sector influences causal mechanisms, second-order, multiple-order, and international digital divides.	Contextual and methodological gaps were found because the literature review was carried out in Romania, without empirical findings.	The quantitative case study approach would generate empirical evidence about how digital transformation practically works at Graffins College.
Al-Taweel et al. (2020)	*Evaluation of technology-based learning by dental students during the pandemic outbreak of Coronavirus disease 2019*	Dental students showed a positive attitude and low-moderate satisfaction level towards technology-based learning.	Contextual, conceptual, and methodological gaps were evident, as the study was conducted at an Iraqi university and focused solely on technology-based learning as one aspect of digital transformation. Also, it had a limited sample size consisting only of dental students.	The current study aimed to address these gaps by focusing on HEIs in Nairobi, specifically Graffins College. It also examined four dimensions of the independent variable, using a broader sample that included students from multiple departments.
Khamis et al. (2021)	*The COVID-19 Pandemic: A Catalyst for Creativity and Collaboration for Online Learning and Work-Based Higher Education Systems and Processes*	Coalition among digital systems and processes within HEIs ensured sustainable advancement in terms of educational opportunities and resource management.	The literature review did not present empirical findings.	To address this research gap, this study conducted a quantitative case study.
Paladan (2018)	*Higher Education Institutions Embracing Digital & Social Media Marketing: A Case of Top 25 Universities in Asia & Africa*	Social media impacted efficiency within HEIs in the context of Asia and Africa.	The study exhibited a conceptual gap, as it focused exclusively on the digital marketing aspect—specifically, websites and social media platforms.	The current study dealt with a wider range of independent variables— technology-based learning, partnership and collaboration, and innovation and creativity.
Ali and Nyamboga (2020)	*Adoption of Digital Literacy Strategy on Academic Progress of*	The adoption of digital literacy strategies, particularly e-learning	A methodological gap was evident since the researchers relied solely	This quantitative case study aimed to fill this research gap.

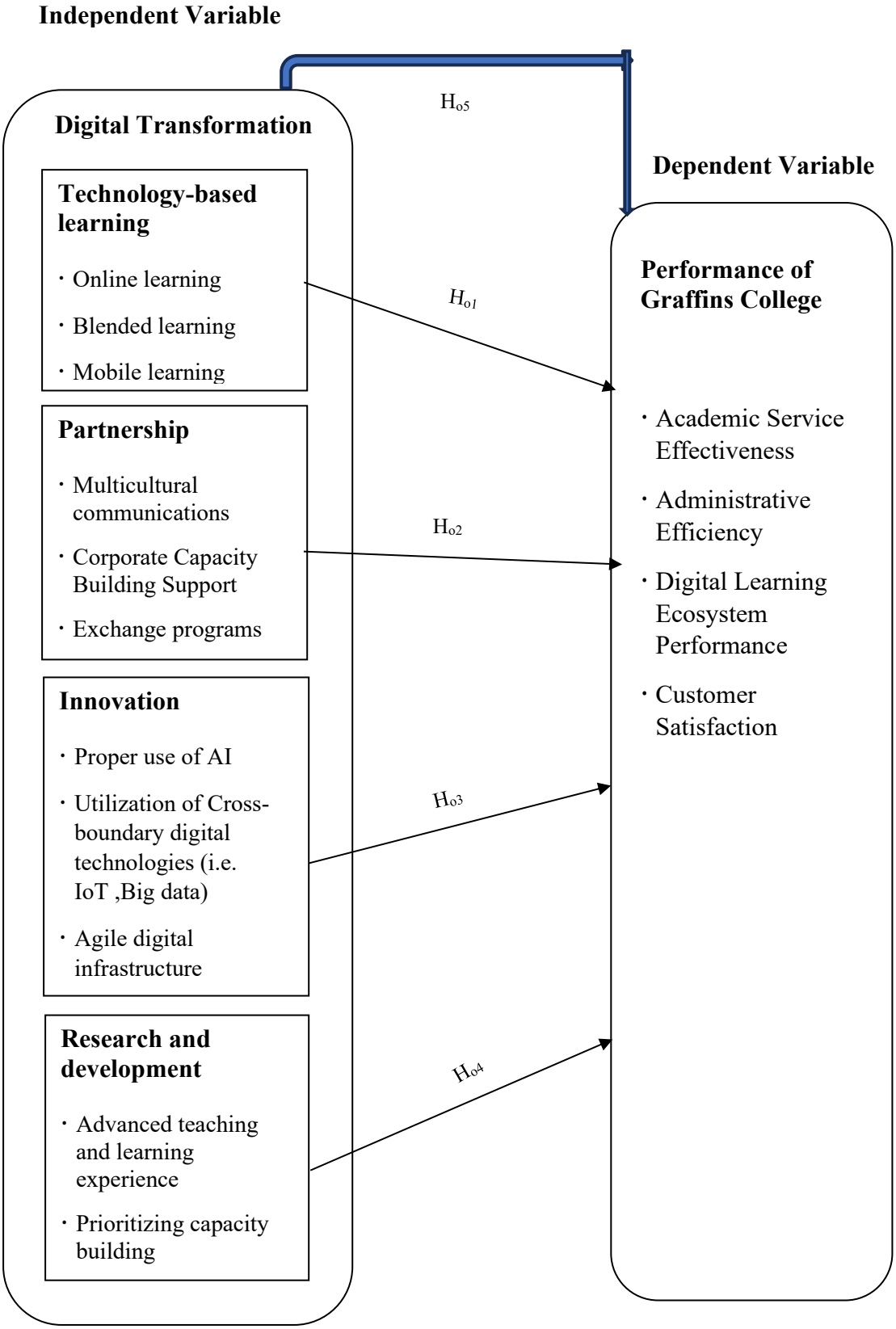
	Private University Education in Kenya: A Survey of Umma University, Garissa Campus	platforms, had a significant positive effect on the academic performance of private universities in Kenya.	on a literature review without incorporating empirical evidence.	
Kamau and Omwenga (2025)	*Digitalization and Service Delivery in the Ministry of ICT and Digital Economy, Kenya*	Digital transformation contributed to the performance of Kenya's Ministry of ICT and Digital Economy by operating an online service system.	The study presented both conceptual and contextual gaps, as it focused on technology-based initiatives in the context of Kenya's Ministry of ICT and Digital Economy.	The current study focused on higher education institutions, particularly tertiary colleges within Nairobi County, with a wide range of digital transformation dimensions such as technology-based learning, partnership and collaboration, innovation and creativity, and research and development.

Conceptual framework

The conceptual framework below illustrates the influence of digital transformation—comprising sub-variables such as technology-based learning, partnerships, innovation, and research and development (Singh&Thurman, 2019; Surahman et al., 2022; Benavides et al., 2020; Segura et al., 2020) —on the performance of institutions of higher learning in Nairobi, particularly Graffins College (Costa et al., 2023; Cosenz, 2022; Paladan, 2018; Kiriri, 2022). The dependent variable was measured using indicators such as academic service quality, administrative efficiency, learning environment and resources, and student satisfaction. These factors are summarised in Figure 1 below. From the figure, it is evident that the performance of institutions of higher learning in Nairobi is dependent on digital transformation, as informed by the resource-based view, dynamic capability, and education process reengineering theories.

Figure 1

Conceptual Framework



Source: Researcher (2025)

The literature review identified key terms and concepts related to the research topic and synthesised existing empirical studies on the linkage between digital transformation and the performance of institutions of higher learning in Nairobi County. Also presented is the conceptual framework of this study, which suggests that digital transformation may influence the performance of Graffins College in technology-based learning, partnership, innovation, research and development, and the combined effects of these elements. This conceptual framework is founded on three key theories: the resource-based view, the dynamic capability theory, and the educational process reengineering theory, which demonstrate the relationships among dependent and independent variables. The main literature gaps the current study aimed to fill included the lack of empirical data regarding the link between digital transformation performance in institutions of higher learning, as well as the fact that most previous studies had focused on narrow outcomes of digital transformation. The current study aimed to address these gaps by focusing on institutions of higher learning in Nairobi, specifically Graffins College. It also examined four dimensions of the independent variable, using a broader sample that included students from multiple departments.

Chapter Summary

This chapter reviewed the previous studies synthesized existing empirical studies about the linkage between digital transformation and performance of institutions of higher learning, while literature gaps of original material discussed in this literature review section were also discovered. Additionally, the theoretical framework showed the underpinned theories (i.e. Resource-Based View (RBV) theory, Dynamic Capability theory, and Educational Process Reengineering (EPR) theory) of this study. Further, the chapter introduced the conceptual framework of this study that

digital transformation influence performance of Graffins College in terms of technology-based learning, partnership, innovation, research and development, and the combined effects of these elements.

CHAPTER THREE: RESEARCH METHODOLOGY

Introduction

This chapter outlines the research methodology, including the research philosophy, design, target population, sample size, sampling method, data collection procedures, instrument pretesting (validity and reliability test), data analysis, and ethical considerations.

Research Philosophy

A post-positivist worldview was adopted when completing this study. The post-positivist philosophy is underpinned by the belief that reality is objective, measurable, and independent of the study. It, therefore, emphasises scientific methods, quantifiable observations, and statistical analysis to explain phenomena. This philosophy seeks to discover universal laws and causal relationships, assuming that knowledge is certain and value-free (Ndarwa & Mulinge, 2023). Post-positivist philosophy also encourages critical thinking, acknowledges the limitations of empirical evidence, and seeks objectivity, while recognising the role of subjectivity in scientific inquiry (Creswell & Creswell, 2018). Post-positivist worldview can be most suitable for this study due to its objectivity. In terms of strategic management, it could say that digital transformation can be not only considered as business-level strategy regarding efficiency in teaching and learning and administrative accessibility but also as corportave-level strategy to level up the value of the college concerning modernization and international research development. Through the positivist worldview, this study could examine whether digital transformation implemented in terms of business-level strategy and corporate-level strategy according to its influence to the performance of Graffins College. Therefore, this worldview was considered the most suitable for conducting the current quantitative research since it allowed

objective collection and analysis of empirical data regarding how digital transformation influences performance of institutions of higher learning.

Research Design

Explanatory research focuses on exploring the relationship between research variables and understanding the reason why or how they are dealt with according to the research objectives (Creswell & Creswell, 2018). In this study, a explanatory case study was adopted as research design to identify the relationships among the research variables and to generate quantitative evidence to fill existing research gaps. This design was deemed most appropriate given the study's objective of systematically analysing survey-derived quantitative data to statistically determine the nature and extent of the relationship between the independent variables, that is, digital transformation strategy dimensions, and the dependent variable, institutional performance of Graffins College. Further, through the cross analysis in case study, this study can examine objectives of the research with in-depth understanding of contextual elements relating to the operation of digital transformation within the college. Through the case study, the researcher can be able to identify the real details regarding respondents' real opinions about digital transformation implemented, organizational culture, digital policy, digital infrastructure, digital litereay level of the users, and resistance level of digital initiatives operated, etc., which can not be detected through literature review.

Target Population

A population refers to a pool of individuals selected by a researcher methodically for data collection and analysis (Creswell & Creswell, 2018). A sample is typically drawn from the target population so that the data it generates are representative of the target population. The population of this study consisted of

institutions of higher learning within Nairobi County, while 163 individuals, including students, faculty, and administrative staff at Graffins College, comprised the subset of the target population that the researcher could realistically reach given practical constraints such as time, geography, and availability.

The Sample Size and Sampling Method

A stratified random sampling method was employed to ensure precise representation across all key stakeholder groups at Graffins College, namely students, faculty, and administrative staff. Stratification helped derive a proportionate and representative sample from each subgroup, enhancing the study's generalizability and reliability (Latpate et al., 2021). A fixed allocation stratified sampling formula was used. The sample size for each stratum was calculated as follows:

$$n_h = N_h \times p \ (n_h = Sample\ size\ selected\ from\ stratum\ h, N_h = Population\ size\ of\ stratum\ h, N = Total\ population\ size, n = Total\ sample\ size, p = fixed\ allocation),$$

This formula allowed the selection of a fixed proportion of samples from each stratum (Statistics Canada, 2020). Each stratum provided a unique and critical perspective that is vital to understanding the dynamics of digital transformation operating throughout the institution. Students represented the primary end-users of digital learning platforms and provided valuable insights into their effectiveness and user experience. Faculty members also contributed professional perspectives on the utilisation of digital literacy in teaching and research activities, while administrative staff could provide insights into the operational phase of digital systems, including support services and institutional workflows.

In terms of sample size, a fixed-allocation stratified sampling formula was used due to the heterogeneity of the strata and the need to minimize sampling bias

(Levy & Lemeshow, 2013; Ongoma et al., 2021). According to Cochran (1977), it says that smaller populations would require relatively larger sampling fractions to minimize sampling error and achieve precision of sampling. Based on these considerations and the previous researches, this study used 45% as sampling rate in order to maintain feasibility in data collection (Asogwa et al., 2012; Issa & Aliyu, 2018). The sample size could be summarised in Table 2.

Table 2

Target Population and Sample Size by Category

Category	Population(N)	Percentage (%)	Sample Size	Value to the Study
Students	150	45	68	Assess usability and the effect of technology-based learning in terms of educational performance and student satisfaction level.
Faculty	10	45	5	Provide insights on digital tool adoption in teaching methods and research development.
Administrative Staff	3	45	2	Evaluate the integration of digital systems in the operational system
Total	**163**		**75**	

Source: Survey Data (2025)

The study findings are generalizable to TVET institutions with similar digital infrastructure within Kenya. However, caution should be exercised when generalizing to institutions with significantly different resource levels or outside the Kenyan context.

Data Collection Method and Procedures

This study adopted a cross-sectional survey using structured questionnaires with 5-point Likert scale questions (See Appendix III) (Daniel, 2022). Although the cross-sectional survey is the most suitable to identify a relationship between research variables efficiently at a single point in time given, its limitation existed concerning

lack of strong evidence of causality. There were two key sections to the questionnaire, as follows: the first section collected data on respondents' demographic background, such as gender, age group, department/school, position, course level, and duration at the college, while the second section was composed of inquiries related to the research variables in relation to the objective of this research. A structured questionnaire was employed as the primary data collection instrument, enabling the efficient and cost-effective gathering of quantitative data within a defined timeframe. Furthermore, the anonymous nature of the questionnaire encouraged candid responses, thereby enhancing the confidentiality, accuracy, and overall reliability of the data collected.

Pilot study

Prior to the main survey, the researcher conducted a pilot study to figure out the reliability and validity of the questionnaire. For the pilot study, about 10 from the sample were selected to ensure they could understand and respond to the questions without. The pilot study sought to identify any ambiguous, misleading, or poorly worded questions that could compromise the quality of data collected during the main survey. Feedback obtained from the pilot participants was systematically reviewed. The necessary revisions were made to the instrument to ensure that all items were clearly understood and capable of generating accurate and meaningful responses. This process strengthened the overall validity and internal consistency of the questionnaire before its full deployment.

Reliability and Validity

Reliability is defined as the degree to which research results remain consistent across repeated measurements and interpretations. The reliability of this study was assessed through Cronbach's Alpha, a widely accepted measure of internal

consistency. A coefficient of 0.7 and above is considered indicative of reliable instrumentation for research purposes. With regard to validity, it is a critical aspect that determines the accuracy and credibility of research findings. Validity can be defined as the degree to which a study accurately measures the research construct it intends to examine (Creswell, 2018). Internal validity assesses whether the study accurately measures the cause-and-effect relationship between variables, while external validity evaluates whether the findings can be generalised to other populations or settings.

A pilot study was conducted prior to the main survey to assess both the reliability and validity of the research instrument. The pilot involved 10 respondents, representing approximately 13% of the total target sample size of 75, a proportion deemed sufficient to meaningfully evaluate the psychometric properties of the questionnaire before full-scale data collection was undertaken at Graffins College.

Regarding the reliability test, this study carried out Cronbach's Alpha test through SPSS version 29. According to the results, it presented that 0.898 of Cronbach's Alpha for overall variables were identified, indicating that the questionnaire was highly reliable . Following the reliability test, the results of the Cronbach's Alpha test are presented in Table 3.

Table 3

Results of the Reliability Test

Variable	Cronbach's Alpha	Remarks
Technology-based learning	0.884	Very highly reliable
Partnership	0.789	Highly reliable
Innovation	0.874	Very highly reliable
Research and Development	0.721	Highly reliable
Performance of Graffins College	0.834	Very highly reliable
Overall	**0.898**	**Very highly reliable**

Source: Pilot study Data (2025)

Additionally, to assess the suitability of the data for factor analysis, the researcher carried out KMO and Bartlett's Test through SPSS for assessing content and construct validity. Al-Fraihat et al. (2020) and Kraus et al. (2021) consistently operationalised similar constructs in their studies, which supports the content and construct validity of the measurement items used in this study. Although this study conceptualized four sub-independent variables, the results of the test are presented to the single dominant factor due to their high interrelation. Based on the results of the exploratory factor analysis, it was found that the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.872, and the Bartlett's Test of Sphericity was statistically significant ($p < 0.001$), indicating that the data were suitable for factor analysis. The results of the KMO and Bartlett's tests are presented in Table 4.

Table 4

Results of the Validity Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.872
Bartlett's Test of Sphericity	Approx. Chi-Square	2748.101
	df	703
	Sig.	<.001

Source: Pilot study Data (2025)

Data analysis

Data analysis is a systematic process of examining and interpreting data collected. In this study, both descriptive and inferential statistical analyses (hypothesis analysis) were conducted. The descriptive analysis summarises data to reveal patterns, averages, and trends, using frequencies, means, modes, standard deviations, as well as graphical and tabular representations. Inferential analysis aims to make predictions or generalisations about a larger population based on sample data, with results also presented through graphs and tables (Dabas, 2024). Both descriptive and inferential

analyses were conducted using SPSS version 29. Before conducting inferential analyses, a diagnostic test to verify hypotheses throughout the questionnaire set, in terms of normality, linearity, and multicollinearity, was completed.

Demographic characteristics comprised of respondents' individual characteristics, including gender, age group, department/school, position, course level, and duration at the College. The results were presented in the table. In terms of descriptive analysis, SPSS version 29 was also used to evaluate quantitative data collected and summarise the replies from respondents regarding the research topic. In the descriptive analysis, the mean was defined as the average level of agreement with each item, representing overall tendencies. At the same time, the standard deviation indicated the consistency of responses among respondents. These statistics enabled a systematic overview of perceptions across research variables and had a role as a foundation for further inferential analysis.

In terms of inferential analysis, correlation analysis was conducted to establish the strength and direction of the linear relationships between research variables (Creswell & Creswell, 2018). Pearson's correlation coefficient (r), which shows the degree of relationship among the variables, was calculated. The range of correlation coefficient values is from -1 to +1, which means that the closer the figure goes to -1 or +1, the stronger the relationship between the variables. The results of the correlation analysis contributed to identifying whether the variables under research move together systematically and whether multicollinearity may be present. The correlation results were presented in a correlation matrix table, presenting the pairwise relationships between research variables. This step was vital in understanding the preliminary relationships among the study variables before conducting the regression analysis. Correlations were interpreted with reference to their p-values and the

strength of association, as guided by commonly accepted thresholds: 0.1 for weak association, 0.3 for moderate association, and 0.5+ for strong association. These findings were discussed in the subsequent chapter in relation to the hypotheses and conceptual framework of the study.

In addition to the correlation analysis, regression analysis was completed to examine the relationship between digital transformation and the performance of Graffins College. The empirical model for regression analysis is specified as follows:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Where:

Y= Performance of Graffins College

a= a constant,

X_1= Technology-based learning

X_2= Partnership

X_3= Innovation

X_4= Research and development

X_5= Digital transformation, which is a combination of technology-based learning,

partnership, innovation, and research and development

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = Beta Coefficients of the independent variables,

ε = error term

For regression analysis (hypothesis testing), results were reported using a model summary table (including R, R^2, and adjusted R^2), an ANOVA table (to test model significance), and a Regression Coefficients table (to interpret the effects and significance of predictors) (Creswell & Creswell, 2018). In the model summary, the R-square (R^2) value presents the proportion of variance in the dependent variable

explained by the independent variables, demonstrating the model's overall explanatory power. In the ANOVA table, the p-value (Sig.) indicates the significance of each null hypothesis. It means that if the p-value is less than the conventional threshold, which is normally 0.05, the null hypothesis is rejected. The beta coefficient (β) presents how strongly each independent variable influences the dependent variable. In summary, these indicators determined whether the null hypotheses were supported. These outputs were discussed in detail in the subsequent chapter to interpret the relationship between digital transformation and the performance of Graffins College.

As mentioned above, a pilot study was conducted to ensure the validity and reliability of the questionnaires. Also, prior to conducting the regression analysis, the researcher carried out a diagnostic test using SPSS; a normality test, such as Shapiro-Wilk test, to verify that the residuals were normally distributed; a linearity test, such as Pearson Correlation, to confirm that there was a linear relationship between research variables, and a multicollinearity test, such as Variance Inflation Factor (VIF), to identify potential strong correlations among the independent variables.

Ethical Considerations

This study adhered to ethical standards throughout all stages of the research process. All respondents involved in data collection and analysis were not coerced to participate in the questionnaire (Pietilä et al., 2019). Participation was entirely voluntary. A letter of introduction was presented to participants to ensure they understood the nature and purpose of the study before participating (See Appendix I). They also signed an informed consent form (See Appendix II). In addition, the anonymity of the participants was ensured, and their personal information was fully protected to maintain confidentiality (Nafsi, 2023). Furthermore, the dignity of all

respondents was respected, and the researcher avoided offensive or inappropriate language during questionnaire administration. After completing a comprehensive ethics review by the Pan Africa Christian University (PACU) ethics review board, the researcher obtained a research permit from Pan Africa Christian University (See Appendices V). The researcher also acquired a requisite research permit from the National Commission for Science, Technology, and Innovation (NACOSTI) (See Appendix VI).

Chapter summary

This chapter specified the research design and identified the target population, sample size, and sampling method. Additionally, the data collection and analysis methods were described, while the pilot study was conducted under the study design. Lastly, this chapter clarified the ethical considerations that were ensured throughout all processes of the study.

CHAPTER FOUR: RESULTS AND DISCUSSION

Introduction

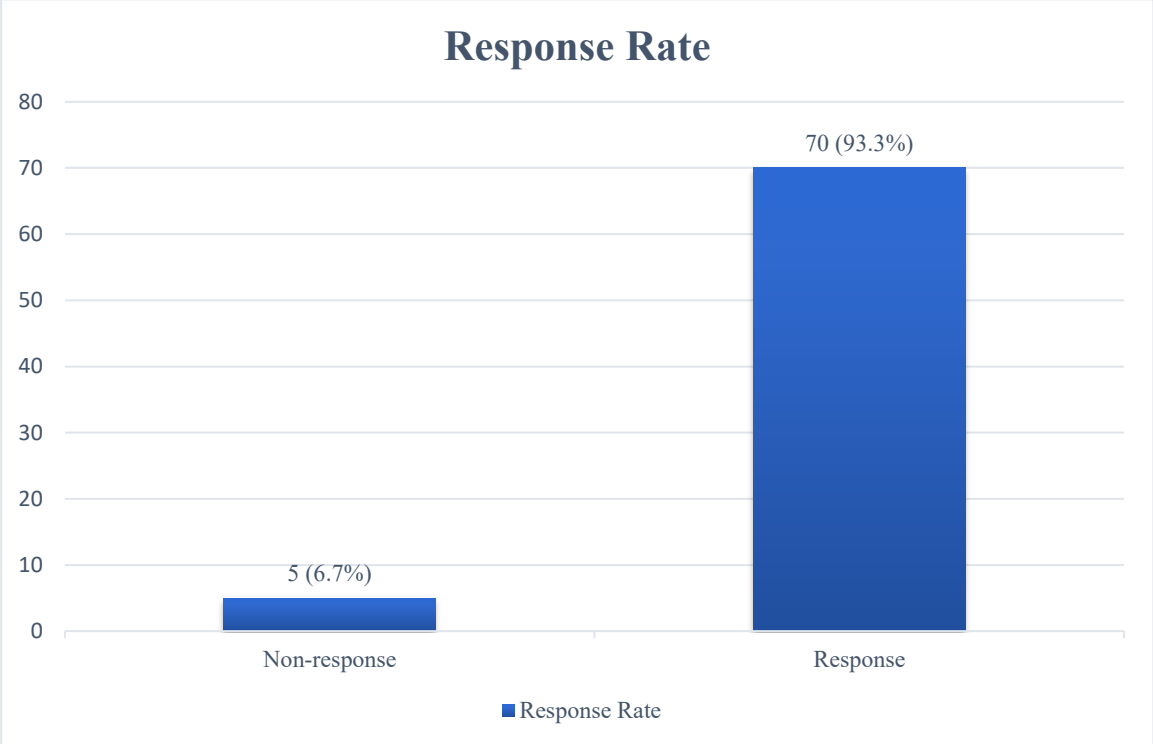
This chapter is composed of the findings and results regarding response rate, demographic characteristics, descriptive analysis, diagnostic test, and inferential analysis. The results of the study are discussed comprehensively.

Response Rate

During the data collection phase, 75 questionnaires were distributed. However, only 70 questionnaires were answered and used for analysis, indicating a response rate of 93.3%. This response rate was considered sufficient for analysis, with respect to Mugenda and Mugenda (2019), who suggested that a return rate of 50% or more was satisfactory for analysis. The response rate is presented in Figure 2.

Figure 2

Response Rate



Demographic Characteristics of Respondents

The demographic characteristics are presented in Table 5.

Table 5

Demographic Characteristics of Respondents

Category	Frequency	Percent
Gender		
Male	38	50.70%
Female	32	42.70%
Total	**70**	**100%**
Age Group		
18-24 years	50	66.70%
25-34 years	15	20.00%
35-40 years	3	4.00%
Above 40	2	2.70%
Total	**70**	**100%**
Department/School		
Technology	24	32.00%
English	44	58.70%
Others	2	2.70%
Total	**70**	**100%**
Position		
Student	63	90.00%
Faculty	5	7.10%
Administrative Staff	2	2.90%
Total	**70**	**100%**
Course Level		
Diploma	22	29.30%
Certificate	37	49.30%
Others	11	14.70%
Total	**70**	**100%**
Duration at the College		
Below 3 months	21	28.00%
3-6 months	31	41.30%
6 months-1 year	7	9.30%
1-2 years	5	6.70%
Above 2 years	6	8.00%
Total	**70**	**100%**

Source: Survey Data (2025)

According to Table 5, male respondents were 38 (50.70%) and female respondents were 32 (42.70%), indicating that the gender distribution of respondents was sufficiently balanced to conduct the analysis. The findings indicate that most respondents were younger members of Graffins College. This is relevant because younger participants are typically more exposed to smartphones, online learning platforms, and other digital services, which can shape their familiarity with— and expectations of—digital transformation. Accordingly, the age distribution suggests that many respondents were well-positioned to evaluate the college's technology-enabled processes and services from a user perspective.

In terms of department/school, the findings show that most of the respondents took English courses (58.70%), followed by technology courses (32.00%), indicating that the survey had more students from English courses than from technology courses. Regarding position, the findings present that most of the respondents were students (90.00%), followed by the faculty (7.10%) and administrative staff (2.90%), indicating that the survey mostly collected empirical data from the students, who are practical users of the digital transformation strategy operated within the college.

Also, most respondents were students (90.00%), followed by faculty (7.10%) and administrative staff (2.90%). This distribution implies that the results primarily reflect students' direct experiences with the college's digitally enabled learning environment—such as access to online learning platforms, digital communication channels, and technology-supported academic services—which are the most immediate pathways through which digital transformation can influence perceived performance outcomes.

Regarding course level, most respondents were taking certificate courses (49.30%), followed by diploma courses (29.30%) and others (14.70%), indicating that

most were focused on short courses of 3 to 6 months. Lastly, regarding tenure, many respondents had been at the college for about three to six months (41.30%), followed by those who had been there for less than three months (28.00%), those who had been there for one to one year (9.30%), and then more than two years (8.00%). The results indicate that the respondents were concentrated in short courses lasting up to six months and were likely to prefer practical learning.

Descriptive Analysis

Descriptive analysis consisted of frequency, mean, and standard deviation (see Table 7).

Technology-based Learning and Performance of Graffins College

The findings on the relationship between technology-based learning and the performance of Graffins College are presented in the following table.

Table 6

Technology-based Learning and Performance of Graffins College

Items	SD	D	N	A	SA	Mean	SD
1. The college delivers high-quality online learning experiences.	16 (22.9%)	5 (7.1%)	13 (18.6%)	22 (31.4%)	14 (20.0%)	3.19	1.45
2. Blended learning is effectively integrated into the academic curriculum.	6 (8.6%)	8 (11.4%)	15 (21.4%)	18 (25.7%)	23 (32.9%)	3.63	1.29
3. Mobile learning platforms are accessible and user-friendly.	10 (14.3%)	4 (5.7%)	9 (12.9%)	17 (24.3%)	30 (42.9%)	3.76	1.43

4. I can access digital learning materials anytime and anywhere.	9 (12.9%)	10 (14.3%)	14 (20.0%)	14 (20.0%)	23 (32.9%)	3.46	1.41
5. I am confident in using digital tools for academic tasks.	8 (11.4%)	6 (8.6%)	10 (14.3%)	17 (24.3%)	29 (41.4%)	3.76	1.38
6. Online assessments are conducted in an efficient and fair manner.	27 (38.6%)	6 (8.6%)	11 (15.7%)	9 (12.9%)	17 (24.3%)	2.76	1.65
7. The college provides sufficient training on e-learning platforms.	17 (24.3%)	7 (10.0%)	18 (25.7%)	13 (18.6%)	15 (21.4%)	3.03	1.46
8. Technology-based learning contributes positively to overall academic performance.	9 (12.9%)	3 (4.3%)	12 (17.1%)	20 (28.6%)	26 (37.1%)	3.73	1.35

Based on the findings presented above, table 6 shows that approximately 70% of the respondents agreed that the college delivered high-quality online learning experiences (M=3.19, SD=1.45), indicating moderate levels of satisfaction with some variability in responses. In relation to blended learning, a higher proportion of respondents (approximately 80%) expressed agreement (M=3.63, SD=1.29), suggesting that blended learning had been effectively integrated into the academic curriculum. Furthermore, approximately 80.1% of the respondents reported access to mobile learning platforms (M=3.76, SD=1.43), indicating relatively strong

accessibility despite some dispersion in responses. Similarly, about 72.9% of respondents agreed that they could access digital learning materials without time and place constraints (M=3.46, SD=1.41), highlighting the flexibility afforded by digital learning environments. Regarding the use of digital tools, the majority of respondents (80%) indicated confidence in using digital devices for academic purposes, demonstrating a generally high level of digital competence among the participants. Overall, these findings suggest that digital and blended learning approaches are positively perceived, although some variability in responses remains.

However, for the items on online assessments and training on e-learning platforms, responses were more mixed. The descriptive results were (M=2.76; SD=1.69) for optimising online evaluation and (M=3.03; SD=1.60) for training via online platforms. Given the study's 5-point Likert scale (1=Strongly Disagree ... 5=Strongly Agree), a mean of 2.76 falls between 'Disagree (2)' and 'Uncertain (3)', indicating that respondents did not clearly endorse this aspect of technology-based learning. This comparatively lower rating suggests that, while online learning may be present, assessment processes and/or institutional support for administering online assessments may lag behind. As emphasised in the reviewed literature, effective online assessment depends not only on platform availability but also on assessment design quality, user readiness, academic integrity measures, and reliable technical support (Mulyadi et al., 2021). Therefore, strengthening staff and student training and refining online assessment processes are priority areas for improving technology-based learning outcomes.

Based on the findings, the majority of respondents agreed that the college had supported online learning, blended learning, mobile learning, accessibility to digital learning materials, usability of digital tools, online assessment, and e-platforms to

improve overall academic performance. This finding was anchored with the previous studies, which were examined in the literature review, and was underpinned by the resource-based view theory, which is one of the theoretical framework, identifying that the college had considered technology-based learning effective as resource to advance its performance in terms of efficiency of teaching and learning, student enrolment, marketing effect, administrative efficiency, and academic excellence (Gerhart & Feng, 2021; Shahbaz et al., 2018).

The researcher suggests that technology-based learning can actually work by implementing both practical exercise under sufficient digital infrastructure and training for digital literacy. In the context of Kenya's TVETs, these findings are partly aligned with the reality of the institutions regarding hard digital infrastructure, such as LMS, Smart classrooms, and Student Information Management Systems, whereas the college focus relatively less on capacity-building program and training for digital literacy compared to the findings in the existing studies (Zeleza & Okanda, 2021; Omutange et al., 2025).

Partnership in digital transformation and Performance of Graffins College

The findings on whether partnership in digital transformation affects the performance of Graffins College are presented in the following table:

Table 7

Partnership in digital transformation and Performance of Graffins College

Items	SD	D	N	A	SA	Mean	SD
1. The college establishes formal partnerships and collaborations to facilitate the	32 (42.7%)	7 (9.3%)	9 (12.0%)	14 (18.7%)	8 (10.7%)	2.41	1.50

adoption of digital innovation.							
2. I have had opportunities to participate in webinars to understand digital transformation.	33 (44.0%)	11 (14.7%)	7 (9.3%)	9 (12.0%)	10 (13.3%)	2.31	1.52
3. Partnerships with international institutions enhance digital literacy.	33 (44.0%)	5 (6.7%)	11 (14.7%)	7 (9.3%)	14 (18.7%)	2.49	1.62
4. I have experienced cross-cultural communication related to digital transformation.	29 (38.7%)	5 (6.7%)	7 (9.3%)	12 (16.0%)	17 (22.7%)	2.76	1.69
5. The college implements digital security capacity-building programs in partnership with industries.	33 (44.0%)	1 (1.3%)	11 (14.7%)	13 (17.3%)	12 (16.0%)	2.57	1.62
6. Collaborative learning contributes to enhancing inclusion in digital transformation.	33 (44.0%)	4 (5.3%)	8 (10.7%)	13 (17.3%)	12 (16.0%)	2.53	1.62
7. Strategic partnerships support the effective use of automated administrative systems.	32 (42.7%)	5 (6.7%)	7 (9.3%)	14 (18.7%)	12 (16.0%)	2.56	1.62

Based on Table 7, it presents that 41.4% of the respondents agreed that the college had established formal partnerships to facilitate the adoption of digital

innovation (M=2.41, SD=1.50), indicating relatively low levels of agreement. Similarly, a smaller proportion of respondents (34.6%) agreed that they had opportunities to participate in webinars aimed at enhancing their understanding of digital transformation (M=2.31, SD=1.52). With regard to partnerships with international institutions, 42.7% of the respondents indicated that they had engaged in webinars related to digital literacy (M=2.49, SD=1.62), suggesting limited exposure to such initiatives. Furthermore, approximately 44% of respondents agreed that collaborative learning had contributed to enhancing inclusion in digital transformation (M = 2.53, SD=1.62). Likewise, 44% of the respondents agreed that strategic partnerships supported the effective use of automated administrative systems (M=2.56, SD=1.62). Overall, the findings suggest that while some partnerships and collaborative initiatives are in place, their impact on digital transformation is relatively moderate, with relatively low levels of respondent agreement across the measured indicators.

According to the findings, the item on experience in cross-cultural communication yielded a mean of 2.76 (SD=1.69). On a 5-point Likert scale, a mean of 2.76 falls within the 'neutral' to 'disagreement' range, rather than agreement. This indicates that a significant portion of respondents felt that opportunities for cross-cultural communication related to digital transformation were insufficient or unclear, highlighting a gap in the practical implementation of international digital partnerships. This result is mainly underpinned by dynamic capability theory, which indicates that the administrative staff and the lecturers have engaged in webinars addressing digital transformation strategy (sensing) and adopted effective digital initiatives for performance improvement (seizing and restructuring).

Based on the finding, the researcher understand that partnership has a key role for amplifying the effects of digital transformation with collective knowledge established. However, due to limited funding and irregular collaborative programmes, the researcher could guess that partnership in digital transformation with big-tech companies and other educational institutions hindered their processes. These limitations are aligned with the study reviewed (Irungu, 2025), which has a context of Nyandarua National Polytechnic, in terms of business-oriented digital curriculum, meaning that partnership in digital transformation should be required to make existing digital initiatives enhanced.

Innovation in digital transformation and Performance of Graffins College

Regarding the influence of innovation in digital transformation on the performance of Graffins College, the results are presented in the following table:

Table 8

Innovation in digital transformation and Performance of Graffins College

Items	SD	D	N	A	SA	Mean	SD
1. The college encourages the innovative use of AI, IoT, and Big Data in teaching and learning.	25 (33.3%)	5 (6.7%)	8 (10.7%)	19 (25.3%)	12 (16.0%)	3.57	1.43
2. The college is equipped with offline-friendly digital technologies.	19 (25.3%)	11 (14.7%)	10 (13.3%)	18 (24.0%)	12 (16.0%)	2.90	1.49
3. The college is organised with the integration of generative AI tools to improve the quality of teaching/learning.	28 (37.3%)	9 (12.0%)	12 (16.0%)	13 (17.3%)	8 (10.7%)	2.49	1.46
4. The curriculum aligns with the	24 (32.0%)	6 (8.0%)	16 (21.3%)	12 (16.0%)	12 (16.0%)	2.74	1.51

latest digital transformation strategies from the National Digital Policies.							
5. The college has adopted the latest digital initiatives to enhance inclusion and equity.	13 (17.3%)	8 (10.7%)	20 (26.7%)	13 (17.3%)	15 (20.0%)	3.26	1.74
6. The college conveys digital literacy development programs updated by innovative digital transformation strategies.	31 (41.3%)	2 (2.7%)	7 (9.3%)	16 (21.3%)	14 (18.7%)	2.71	1.69
7. The E-portal has been updated according to the up-to-date digital initiatives.	16 (21.3%)	4 (5.3%)	14 (18.7%)	16 (21.3%)	20 (26.7%)	3.29	1.51
8. The college invests in modern and agile digital infrastructure.	16 (21.3%)	6 (8.0%)	9 (12.0%)	21 (28.0%)	18 (24.0%)	3.27	1.51

Based on the finding above, table 8 shows that the respondents agreed, proportionally by 52% (M=3.57, SD=1.43), that the college had encouraged the innovative use of AI, IoT, and Big Data in teaching and learning. It was reported that approximately 53.3% (M=2.90, SD=1.49) of the respondents agreed that the college was equipped with offline-friendly digital technologies. Regarding generative AI tools, 44% of the respondents agreed that the college had encouraged the integration of generative AI tools for improvement of the quality of teaching and learning (M=2.49, SD=1.46). It was found that 53.3% of respondents agreed that the curriculum aligned with the latest digital transformation strategies outlined in the National Digital Policies (M=2.74, SD=1.51).

The respondents agreed, proportionally by 52% (M=3.57, SD=1.43), that the college had encouraged the innovative use of AI, IoT, and Big Data in teaching and learning. It was reported that approximately 53.3% (M=2.90, SD=1.49) of the respondents agreed that the college was equipped with offline-friendly digital technologies. Regarding generative AI tools, 44% of the respondents agreed that the college had encouraged the integration of generative AI tools to improve the quality of teaching and learning (M=2.49, SD=1.46). It was found that 53.3% of the respondents agreed that the curriculum aligned with the latest digital transformation strategies outlined in national digital policies (M=2.74, SD=1.51).

In terms of inclusion and equity, 64% of the respondents (M=3.26, SD=1.74) agreed that the college had adopted the newest digital initiatives to contribute to improving their participation in the lectures and activities offered by the college. The respondents, proportionally 49.3%, agreed that the college conveys digital literacy development programs updated by innovative digital transformation strategies (M=2.71, SD=1.69). With regard to the e-portal, 66.7% (M=3.29, SD=1.51) of the respondents agreed that the college should update the online portal according to the latest digital initiatives. Similarly, 64% (M=3.27, SD=1.51) of the respondents agreed that the college invested in modern and agile digital infrastructure.

Based on these results, the college seemed to offer minimal support for innovation in digital transformation compared to technology-based learning, meaning that there was little concentration on encouraging innovative updates on digital transformation within the institute, but focused on implementing technology-based learning, which emphasised online education services. This finding was anchored on previous studies examined in the literature review that innovation in digital transformation has positively affected the performance of higher education

institutions in Kenya (Ali & Nyamboga, 2020; Kamau & Omwenga, 2025). On the other hand, this finding was also underpinned by educational process reengineering theory, meaning that the college has adopted the latest digital initiatives, particularly in terms of generative AI, e-portal, and agile digital infrastructure, and restructured these initiatives according to its policy and conditions for performance (Pasaribu et al., 2021; Wang & Liu, 2021). According to these findings, the researcher could say that the college would undergo difficulties to utilize digital transformation unless the institute does engage in continuous digital innovation showcases and industry immersion programs, such as Safaricom innovation centre visits and Microsoft Africa Development Centre workshops.

Research and Development in digital transformation and Performance of Graffins College

The findings regarding the impact of research and development on the performance of Graffins College are presented in the following table:

Table 9

Research and Development in digital transformation and Performance of Graffins College

Items	SD	D	N	A	SA	Mean	SD
1. The college provides robust AI services to support performance improvement.	32 (42.7%)	10 (13.3%)	13 (17.3%)	7 (9.3%)	8 (10.7%)	2.27	1.42
2. The curriculum, leveraging an updated digital transformation strategy, improves learning outcomes.	28 (37.3%)	5 (6.7%)	10 (13.3%)	15 (20.0%)	12 (16.0%)	2.69	1.58

3. The college has updated digital education services in accordance with the National Digital Policy 2025.	26 (34.7%)	9 (12.0%)	13 (17.3%)	11 (14.7%)	11 (14.7%)	2.60	1.51
4. I'm satisfied with the education service aligned with Next-Generation Connectivity.	30 (40.0%)	8 (10.7%)	5 (6.7%)	15 (20.0%)	12 (16.0%)	2.59	1.61
5. I have received training on the ethical use of digital transformation.	29 (38.7%)	11 (14.7%)	7 (9.3%)	11 (14.7%)	12 (16.0%)	2.51	1.57
6. The college supports e-assessment in accordance with the latest standards.	26 (34.7%)	8 (10.7%)	13 (17.3%)	10 (13.3%)	13 (17.3%)	2.66	1.55
7. The college provides capacity-building programs to train the community in using its online learning services.	29 (38.7%)	4 (5.3%)	10 (13.3%)	13 (17.3%)	14 (18.7%)	2.70	1.63

According to table 9, the findings indicates that 37.3% of the respondents (mean=2.27, SD=1.42) agreed that the college provided robust AI services to support performance improvement. Regarding the curriculum, 49.3% of the respondents (M=2.69, SD=1.58) agreed that lecturers updated the curriculum by leveraging digital transformation strategies to enhance educational performance. Additionally, approximately 46.7% of the respondents (M=2.60, SD=1.51) agreed that the college

had updated its online learning services in alignment with the National Digital Policy 2025, including initiatives such as the Kenya Artificial Intelligence Strategy 2025, which emphasises the data ecosystem, local AI models, and inclusion advancement programs.

Regarding Next-Generation Connectivity, 42.7% of the respondents (M=2.59, SD=1.61) agreed that they were satisfied with educational services that encourage participants to develop relationships and collective intelligence. In terms of training on the ethical use of digital transformation, 40% of the respondents (M=2.51, SD=1.57) agreed that the college provided training on the ethical use of digital data and digital techniques. It was further identified that 47.9% of the respondents (M=2.66, SD=1.55) agreed that the college supported e-assessment platforms, such as iBT TOEFL, online CATs, and online final examinations, in accordance with current standards. Additionally, 49.3% of the respondents (mean=2.70, SD=1.63) agreed that the college offered capacity-building programs to train the community to use its online learning services, including the LMS, e-library, and ICT labs.

Based on the findings, fewer respondents, compared to those in technology-based learning, innovation, and creativity, agreed that the college supported research and development in digital transformation to enhance its performance, while the results were comparable to those on partnership and collaboration. These findings indicate that the college should focus on updating its curriculum in alignment with digital transformation strategies and on capacity building to train users in adopting the online learning system. These findings corroborates previous research discussed in the literature review, which showed that research and development in digital transformation positively influences the performance of institutions of higher learning in Kenya (Odhiambo, 2025), followed by the critical aspect that the college could be

recommended to conduct digital pedagogy experimentation to examine the new digital learning approach and evaluate its effectiveness. Furthermore, the finding is underpinned by the resource-based view, which holds that the college has adopted digital transformation to upgrade its curriculum and build capacity for user training to enhance institutional performance.

The Performance of Graffins College

The findings on the performance of Graffins College are presented in the following table:

Table 10

Performance at Graffins College

Items	SD	D	N	A	SA	Mean	SD
1. Graffins College delivers high-quality academic programs aligned with student needs.	11 (14.7%)	7 (9.3%)	8 (10.7%)	15 (20.0%)	29 (38.7%)	3.63	1.50
2. The college provides students with webinars for ethical leadership.	19 (25.3%)	8 (10.7%)	13 (17.3%)	15 (20.0%)	15 (20.0%)	2.98	1.52
3. Administrative services at the college are efficient and responsive.	10 (13.3%)	3 (4.0%)	7 (9.3%)	22 (29.3%)	28 (37.3%)	3.79	1.39
4. Mutual culture is well-established within the college.	8 (10.7%)	7 (9.3%)	7 (9.3%)	10 (13.3%)	38 (50.7%)	3.90	1.45
5. Graduates from the college are well-organised for employment and further study.	7 (9.3%)	6 (8.0%)	15 (20.0%)	16 (21.3%)	26 (34.7%)	3.69	1.32
6. The college has a strong and	6 (8.0%)	5 (6.7%)	8 (10.7%)	21 (28.0%)	30 (40.0%)	3.91	1.27

growing reputation.							
7. I have been well-trained by the academic capacity building offered by the college.	7 (9.3%)	5 (6.7%)	12 (16.0%)	21 (28.0%)	25 (33.3%)	3.74	1.29
8. The college is organized with an excellent learning environment.	6 (8.0%)	4 (5.3%)	12 (16.0%)	17 (22.7%)	31 (41.3%)	3.90	1.28

Based on the findings, table 10 shows that 69.4% of the respondents (M=3.63, SD=1.50) agreed that the college delivered high-quality academic programs aligned with student needs. In contrast, with respect to ethical leadership, fewer respondents, 57.3% (M=2.98, SD=1.52), agreed that the college provided students with webinars on ethical leadership. Regarding administrative services, 75.9% of the respondents (M=3.79, SD=1.39) agreed that the college's administrative services had been efficient and responsive. Additionally, 73.3% of the respondents (M=3.90, SD=1.45) agreed that the college had established a culture of mutual respect.

Overall, 76% of the respondents (M=3.69, SD=1.32) agreed that graduates from the college were well-prepared for employment and further study. In terms of reputation, 78.7% of the respondents (M=3.91, SD=1.27) agreed that the college had a strong and growing reputation. Additionally, 77.3% of the respondents (M=3.74, SD=1.29) agreed that they had been well-trained through the academic capacity-building programs offered by the college. It is further noted that 80% of the respondents (M=3.90, SD=1.28) agreed that the college was organised and provided an excellent learning environment.

Based on the results, most respondents agreed that the college had supported academic programs, administrative services, social networks, graduate systems, reputation, capacity building, and the learning environment. Ethical leadership,

however, appeared less emphasised compared to other functions. This suggested that the college may prioritise profit-oriented education over personal and ethical development. These findings are consistent with previous studies discussed in the literature review, which measured college performance using metrics such as academic service quality, administrative efficiency, learning environment and resources, and student satisfaction (Costa et al., 2023; Maingi, 2020; Cosenz, 2022; Mbote, 2019; Bianchi and Caperchione, 2022; Paladan, 2018; Pokrovskaia et al., 2019; Kiriri, 2022). Furthermore, this finding is anchored in the resource-based view theory, which posits that the performance of the college is determined by key elements considered significant institutional resources (Seriki, 2020; Gerhart & Feng, 2021; Iruthayasamy, 2021).

Diagnostic Tests

Various diagnostic tests were completed before conducting the hypothesis analysis to confirm that the regression analysis was suitable. The diagnostic tests consisted of normality, linearity, and multicollinearity tests.

Normality Test

Normality test examines whether a variable of a model follows a normal distribution for the hypothesis tests (Gosselin, 2024). The results of the normality test are presented in the following table.

Table 11

Normality Test

	Shapiro-Wilk Test		
	Statistic	**df**	**Sig.**
TBL	.943	70	.003
Partnership	.845	70	<.001
Innovation	.827	70	<.001

Research and development	.879	70	<.001
Performance	.916	70	<.001

According to table 11, it presents that,for technology-based learning, the Shapiro-Wilk test showed statistics of 0.943 ($p<0.003$), indicating that the data were normally distributed. For partnership, the Shapiro-Wilk statistic was 0.845 ($p<0.001$), indicating that the data were normally distributed. For innovation, the Shapiro-Wilk test showed statistics of 0.827 ($p<0.001$), indicating normal distribution. For research and development, the Shapiro-Wilk test yielded a p-value of 0.879 (<0.001), indicating a normal distribution. Finally, for the performance of Graffins College, the Shapiro-Wilk test showed statistics of 0.916 (<0.001), indicating normal distribution.

Linearity Test

The linearity test evaluates whether the relationship between research variables is linear, indicating how independent variables have a relationship with a dependent variable proportionately (Anandhi & Nathiya, 2023). The results of the linearity test are presented in Table 13 and Figure 2.

Table 12

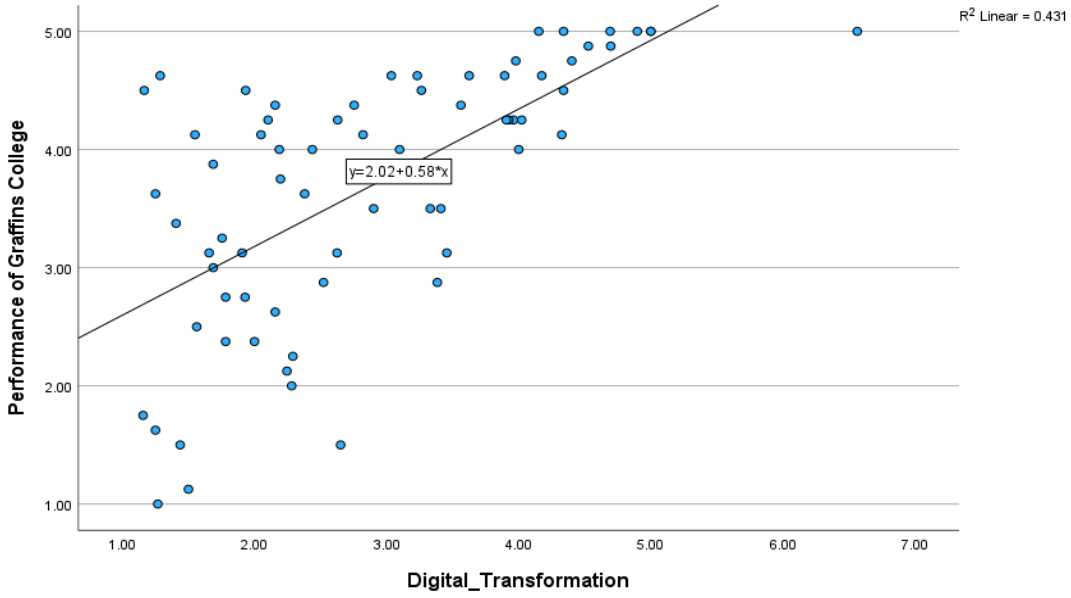
Linearity Test

		Performance of Graffins College	**Remarks**
Technology-based learning	Pearson Correlation	.670***	Positive linear relationship
	Sig. (2-tailed)	<.001	
	N	70	
Partnership	Pearson Correlation	.616***	Positive linear relationship
	Sig. (2-tailed)	<.001	
	N	70	

Innovation	Pearson Correlation	.541***	Positive linear relationship
	Sig. (2-tailed)	<.001	
	N	70	
Research and Development	Pearson Correlation	.518***	Positive linear relationship
	Sig. (2-tailed)	<.001	
	N	70	
***. Correlation at 0.001(2-tailed)			

Figure 3

Linearity Test



According to Table 12 , it shows that the Pearson correlation coefficient between Technology-based Learning and the Performance of Graffins College was 0.670 ($p<0.001$), indicating a moderate positive linear relationship with a statistically significant correlation. For Partnership and Collaboration, the Pearson correlation coefficient was 0.616 ($p<0.001$), indicating a moderate positive linear relationship with statistical significance. For Innovation and Creativity, the Pearson correlation coefficient was 0.541 ($p<0.001$), indicating a moderate positive linear relationship

with statistical significance. Similarly, for Research and Development, the Pearson correlation coefficient was 0.518 ($p<0.001$), indicating a moderate positive linear relationship with statistical significance.

According to Figure 3, it presents that the finding of the linearity test showed that digital transformation, consisting of sub-independent variables such as technology-based learning, partnership and collaboration, innovation and creativity, and research and development, had a linear relationship with the performance of Graffins College, which is the dependent variable.

Multicollinearity Test

A multicollinearity test evaluates the extent to which two or more independent variables in a regression model are highly correlated, which can distort the estimation of regression coefficients (Kim, 2019). The research adopted regression analysis, specifically collinearity statistics. The findings of the multicollinearity test are presented in the table below.

Table 13

Multicollinearity Test

Variable	Collinearity Statistics	
	Tolerance	**VIF**
Technology-based learning	0.392	2.553
Partnership	0.253	3.952
Innovation	0.438	2.284
Research and development	0.287	3.482

a. Dependent Variable: Performance of Graffins College

According to Table 13, it presents that all variables had Variance Inflation Factor (VIF) values of below 10 (Technology-based learning=2.553, Partnership and collaboration=3.952, Innovation and creativity=2.284, as well as research and development=3.482) and tolerance values above 0.1 (technology-based learning=0.392, partnership and collaboration=0.253, Innovation and

creativity=0.438, and Research and development=0.287), indicating that multicollinearity was not a concern.

Inferential Analysis

Correlation analysis

A correlation analysis was performed to examine how the independent variables related to the dependent variable. The result of the analysis is presented in Table 15.

Table 14

Correlation Analysis

		Technology-Based Learning	Partnership	Innovation	Research and Development	Digital Transformation	Performance of Graffins College
Technology-based learning	Pearson Correlation (r)	1	.730***	.691***	.664***	.682***	.670***
	Sig. (2-tailed)		<.001	<.001	<.001	<.001	<.001
	N	70	70	70	70	70	70
Partnership	Pearson Correlation(r)	.730***	1	.667***	.829***	.722***	.616***
	Sig. (2-tailed)	<.001		<.001	<.001	<.001	<.001
	N	70	70	70	70	70	70
Innovation	Pearson Correlation(r)	.691***	.667***	1	.671***	.682***	.541***
	Sig. (2-tailed)	<.001	<.001		<.001	<.001	<.001
	N	70	70	70	70	70	70
Research and development	Pearson Correlation(r)	.664***	.829***	.671***	1	.725***	.518***
	Sig. (2-tailed)	<.001	<.001	<.001		<.001	<.001
	N	70	70	70	70	70	70
Digital Transformation	Pearson Correlation(r)	.682***	.722***	.682***	.725***	1	.656***
	Sig. (2-tailed)	<.001	<.001	<.001	<.001		<.001
	N	70	70	70	70	70	70
Performance of Graffins College	Pearson Correlation(r)	.670***	.616***	.541***	.518***	.656***	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	
	N	70	70	70	70	70	70

***. Correlation at 0.001(2-tailed)

Technology-based Learning and Performance of Graffins College

According to table 14, in terms of technology-based learning and the performance of Graffins College, it states that the two variables have a Pearson correlation coefficient (r) of 0.670 with a p-value of less than 0.001, indicating that Technology-based Learning had a moderate correlation with the Performance of Graffins College by 67.0% (r=0.670), while the model was statistically significant (p<0.001). Based on the findings, it indicates that technology-based learning has an effect on the Performance of Graffins College proportionally by 67.0%; that is, Graffins College has significantly contributed to establishing a technology-based learning system for user satisfaction, student engagement, and organisational efficiency.

The finding is consistent with previous studies reviewed that reported positive influence of technology-based learning on academic effectiveness and institutional competitiveness (AL-Taweel et al., 2020; Mulyadi et al., 2021). In the context of Kenyan TVET institutions, the finding re-examines the importance of capacity-building program and training for digital literacy to improve the adoption level of the users and result in the maximum profit regarding business-strategy.

Partnership in digital transformation and Performance of Graffins College

Based on the result in table 14, with regard to partnership in digital transformation and the performance of Graffins College, the two variables had a Pearson correlation coefficient (r) of 0.616 with a p-value of less than 0.001, indicating that Partnership and Collaboration had a moderate correlation with the Performance of Graffins College by 61.6% (r=0.616), while the model was statistically significant (p<0.001). Based on the findings, it can be said that Graffins College has supported partnership in digital transformation proportionally by 61.6%,

which is relatively high, indicating that the majority of respondents, whether students, lecturers, or administrative staff, agreed that they were satisfied with programs related to partnership in digital transformation and applied these programs for their performance advancement.

The finding may be attributed to the ability of partnerships to share with technological expertise and digital innovation hub that may not be available within the college. By collaborating with industry partners, educational institutions, and government agencies, the college contribute to the adoption of digital technologies and their capacity to implement digital transformation initiatives effectively. It was noted that the college would adhere to the original way of implementing digital transformation rather than adapting to the latest digital initiatives due to limited interest with the newest digital initiatives and limited funding for upgrade of them. According to this finding, the researcher would suggest the college to looking for the remedy regarding collaborative digital programmes with other big tech industry, such as Safaricom and Microsoft, and higher learning institutions that focus on sharing practical skills and establishing digital programmes.

Innovation in digital transformation and Performance of Graffins College

According to table 14, with regard to innovation in digital transformation and the performance of Graffins College, the two variables had a Pearson correlation coefficient (r) of 0.541 with a p-value of less than 0.001, indicating that Innovation and Creativity had a moderate positive correlation with the Performance of Graffins College ($r=0.541$), while the model was statistically significant ($p<0.001$). Based on this finding, it can be said that the college supported innovation in digital transformation to a lesser extent compared to other elements ($r=0.541$), indicating that

the college may rely more on existing digital transformation technologies rather than adopting the latest digital initiatives.

The finding is aligned with the studies reviewed (Chen and Roldan, 2021; Ali and Nyamboga, 2020; Kamau and Omwenga, 2025) that innovation in digital transformation is critical concerning online learning distribution and administrative efficiency. From the perspective of the Resource-Based View (RBV) theory, the findings indicate that innovation in digital transformation serves as a strategic resource that enhances institutional performance and its competitiveness. It could highlight that the importance of adequate financial sourcing system in supporting the continuous implementation of innovative digital programmes. According to this finding, the college would be recommend to look for industry partnership and National Research Fund by preparing the proposal composing AI-based learning platform, digital skills development initiatives, e-learning effectiveness research, and industry skills training programmes.

Research and Development in digital transformation and Performance of Graffins College

Based on the finding in table 14, it presents that research and development and the performance of Graffins College had a moderate positive correlation ($r=0.518$), while the model was statistically significant ($p<0.001$), indicating that Research and Development and the Performance of Graffins College had a positive correlation of 51.8%. It can be said that, based on this finding, research and development in digital transformation have focused on optimising existing digital initiatives rather than participating in seminars related to digital transformation strategies and adopting new digital transformation technologies.

The finding is aligned with the previous researches that research and development in digital transformation has positive impact to performance of institutions. However, the finding of this study revealed that the limitation in implementing research and development in digital transformation regarding digital curriculum and capacity building program. In the context of Kenya's private Technical and Vocational College, research and development in digital transformation would focus on practical usage of digital tools and ICT skills to satisfy the need of the industry so that the inner development in implementing digital transformation might be relatively less focused. According to this finding, the college would rather support hard digital transformation than soft digital transformation regarding capacity building program and ethical training for digital literacy.

Combined Digital Transformation Indicators and Performance of Graffins College

According to table 14, it shows that a combination of technology-based learning, partnership, innovation, and research and development in digital transformation had a moderate positive correlation ($r=0.656$), while the model was statistically significant ($p<0.001$). This suggests that combining these elements has a positive impact on the performance of Graffins College proportionally by 65.6%. The college can make a significant contribution to digital transformation strategies through the adaptation of digital techniques, participation in webinars on digital transformation, optimisation of the latest digital initiatives, and capacity building for adopting digital transformation strategies at an organisational level.

Compared to the results of the descriptive analysis, based on their overall synthesis, it was found that the technology-based learning, partnership, innovation, and research and development in digital transformation were generally well coherent

with each other, and that, except for technology-based learning, the combined initiatives produced better returns. This finding is attributed to the reality of Kenya private Technical and Vocational Colleges has been strongly oriented toward an integrated digital ecosystem approach (Technical and Vocational Education and Training Authority, 2024). In terms of competence in the market, the findings could suggest that the combination of four variables mentioned can generally be considered as essential resource contributing to its institutional performance.

Test of Hypotheses

A regression analysis was conducted to test the hypotheses. These hypotheses are as follows:

H_{01} Technology-based learning in digital transformation does not have a relation to the performance of Graffins College.

H_{02} Partnership in digital transformation have no effect on the performance of Graffins College.

H_{03} Innovation in digital transformation have no influence on the performance of Graffins College.

H_{04} Research and development in digital transformation does not have a relation to the performance of Graffins College.

H_{05} Combined technology-based learning, partnership, innovation, and research and development has no effect on the performance of Graffins College.

Test of Hypothesis One

Hypothesis one (H_{01}) was determined as that technology-based learning in digital transformation has not any effects on the performance of Graffins College. The results of the hypothesis test are presented in Table 16.

Table 15

Model Summary for Technology-based Learning

Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.670a	0.449	0.441	0.80293

a. Predictors: (Constant), Technology-Based Learning
b. Dependent Variable: Performance of Graffins College

According to table 15, it shows that R of 0.670, and Adjusted R Square of 0.441 indicated that the research variables had a moderate positive linear relationship (R=0.670), and that 44.1% of the variance in the dependent variable (i.e., the performance of Graffins College) was explained by the predictor (i.e., technology-based learning) included in the model. Therefore, technology-based learning had a moderate positive influence on the performance of Graffins College statistically. Thus, the null hypothesis (H_{o1}) was rejected.

Based on this result, it can be said that technology-based learning positively influences the performance of Graffin College, meaning that online, blended, and mobile learning have contributed to its performance once adequate training was supported. This result aligns with the previous research that online and blended learning have a key role in virtual learning (Omutange et al., 2025).

Table 16

ANOVA Model for Technology-based Learning

ANOVAa						
	Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	35.682	1	35.682	55.348	<.001b
	Residual	43.839	68	0.645		
	Total	79.521	69			

a. Dependent Variable: Performance of Graffins College
b. Predictors: (Constant), Technology-Based Learning

According to table 16, the result of the ANOVA test shows F-statistics of 55.348 > F-critical (1,68) of 3.99 and p-value of less than 0.001, indicating that the model was found sufficient to predict the dependent variable (i.e., performance of Graffins College). Thus, the model was suitable to predict the performance of Graffins College, while showing that the null hypothesis (H_{o1}) was rejected statistically, for F-statistics (55.348) exceeded the F-critical (3.99).

This result is also aligned with the previous research, identifying that technology-based learning had a positive influence on both dental students in Iraq (Al-Taweel et al., 2020) and nursing students in Taiwan (Mulyadi et al., 2021). Also, with regard to the digital technology platform, this result can be explained by the fact that performance in Kenya's TVETs has been supported by digital transformation for its efficiency in conveying teaching services.

Table 17

Coefficients Table for Technology-based Learning

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.451	0.316		4.59	<.001
	Technology-Based Learning	0.657	0.088	0.67	7.44	<.001

According to table 17, the coefficients table shows that an unstandardized coefficient of 0.657 and a p-value of less than 0.001, indicating that a one-unit increase in the independent variable accounted for 65.7% of the variance in the dependent variable (B=0.657), and the model was statistically significant ($p<0.001$). Based on this finding, the null hypothesis (H_{01}) that the technology-based learning does not have any effects on the performance of Graffins College was rejected. The

conclusion is that a one-unit increase in technology-based learning explained 65.7% of the variance in the performance of Graffins College.

It was noted that the technology-based learning, also referred to as virtual learning, has had a remarkable positive impact on the performance of Graffins College, representing tertiary colleges in Kenya. It can be said that mobile learning platforms have had essential influence on the performance of the college in terms of students, lectures, and administrative staffs, meaning that the online platform are useful as students access learning materials and news to improve their background and establish collective knowledge. Regarding lecturers, the digital tools, such as laptop and smartphone, could improve efficiency in teaching. Colleges can also develop the quality of teaching through valuable curricula and resources. This result is also aligned with the previous research that technology-based learning, composed of virtual learning and modern online platforms, could have a highly positive impact on education.

According to the findings, in terms of Model summary, it identifies that technology-based learning accounts for 44.1% of the variance in performance of Graffins College (Adjusted $R^2 = 0.441$), indicating that while technology-based learning is a crucial factor for private Technical and Vocational colleges, environmental factors such as demographic, financial, and economic factors can be able to affect heavily to shape overall performance. Furthermore, the F-statistics of ($F = 55.348$) validates the model's reliability, proving that technology-based learning is a outstanding predictor contributing to institutional success rather than a chance occurrence. This highlights the essential role of digital ecosystems in modern technical and vocational training in a bid to improve both academic and industrial effectiveness. According to the finding of the unstandardized coefficient ($B = 0.657$),

it is proved that the effect of technology-based learning is high moderate, confirming that technology acts as a strong enhancement rather than an necessary resource. Thus, based on the statistical findings, in terms of Educational Process Reengineering theory, it suggests that technology-based learning is supplementary for success in private Technical and Vocational Colleges, especially Graffins College, functioning as one key resource within a broader educational ecosystem as strategic development.

Test of Hypothesis Two

Hypothesis two (H_{o2}) was stated as follows: partnership in digital transformation has no effect on the performance of Graffins College. To verify this, the study adopted regression analysis using SPSS, conducting a test of the null hypothesis. The results of the test are presented in the tables below.

Table 18

Model Summary for Partnership in digital transformation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.616a	.379	.370	.85209

a. Predictors: (Constant), Partnership

According to the findings above in table 18, it presents that R value of 0.616 and an Adjusted R Square value of 0.379 were presented, indicating that the research variables had a moderate positive linear relationship (R=0.616), while suggesting that 37.9% of the variance in the dependent variable (i.e., the Performance of Graffins College) was explained by the independent variable (i.e., partnership and collaboration) included in the model. Therefore, it was concluded that partnership had a statistically significant positive influence on the Performance of Graffins College, showing that the null hypothesis (H_o2) was rejected.

The null hypothesis (H_{02}) that partnership in digital transformation have no effect on the performance of Graffins College was rejected. The results indicate that partnership has had a moderate positive influence on the college's performance. This implies that collaboration—such as coordination with technology vendors, peer institutions, and other stakeholders—can improve access to digital resources, facilitate knowledge sharing, and strengthen implementation capacity, which in turn supports performance outcomes. In line with prior empirical work discussed in the literature review, the evidence here suggests that institutions with stronger collaborative arrangements tend to implement digital initiatives more effectively and experience better service quality and operational efficiency.

It is reasonable to conclude that the positive results of the college were driven by being in partnership with other educational institutions and industries. It would be remarkable that the college had been supported by the industry to enhance the quality of online learning, particularly online assessment such as iBT TOEFL, and improve the experience in teaching and learning, especially in ICT. It was also noted that intentional communication would contribute to increasing student enrolment by adapting the online platform and launching the webinars in order to advertise the college in the global market.

Table 19

ANOVA Model for Partnership in digital transformation

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.149	1	30.149	41.524	<.001b
	Residual	49.372	68	0.726		
	Total	79.521	69			

a. Dependent Variable: Performance of Graffins College
b. Predictors: (Constant), Partnership

According to table 19, the result of the ANOVA test shows that the F-statistic of 41.524 was significantly greater than the F-critical (1,68) of 3.99, and the p-value of less than 0.001, indicating that the model was found sufficient to predict the dependent variable (i.e., performance of Graffins College). Hence, the model was suitable to predict the performance of Graffins College, while showing that the null hypothesis (H_{o2}) was rejected statistically, because the F-statistic (41.524) exceeded the F-critical (3.99).

Based on this result, it is evident that the college has been substantially affected by the digital transformation (F-statistic of 41.524, way greater than F-critical (1,68) of 3.99). It can be said that there are positive impacts of digital transformation on the performance of the college, particularly in ICT, meaning that the digital transformation has a great positive impact on efficiency in teaching and learning, and has advanced its institutional performance.

It is concluded that partnership had a statistically significant positive influence on the performance of Graffins College. This finding is consistent with Khamis et al. (2021), who argued that coalitions among digital systems within HEIs ensure sustainable advancement in resource management. However, contrasted with the low descriptive mean scores found in this study, it implies that while partnerships are statistically critical for performance, the current level of implementation at Graffins College has not yet reached its full potential to satisfy the stakeholders.

Table 20

Coefficients Table for Partnership in digital transformation

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	Std. Error	Beta		

1	(Constant)	2.554	0.204		12.524	<.001
	Partnership	0.452	0.07	0.616	6.444	<.001

a. Dependent Variable: Performance of Graffins College

According to table 20, the coefficients table shows an unstandardized coefficient of 0.452 and a p-value of less than 0.001, indicating that a one-unit increase in the independent variable accounts for 45.2% of the variance in the dependent variable (B=0.452), and the model was statistically significant ($p<0.001$). Thus, a one-unit increase in partnership explained 45.2% of the variance in the performance of Graffins College. The null hypothesis (H_{o2}) was rejected.

It could be said that, from the perspective of administrative staff, the strategic partnership has supported the use of automated administrative services. Partnership with other educational institutions could also have a positive influence on digital literacy and inclusion in digital transformation. It is noted that the digital transformation has had a positive influence on users since it helps build international relationships and supports digital security and capacity-building programs aligned with today's industries. It would be said that the digital transformation could help establish interconnected relations to global HEIs and industries in order to advance overall performance and develop collective intelligence. The result is also closely aligned with the previous studies that partnership with educational institution regarding digital transformation has had a positive influence on the performance of HEIs, such as the Riconnessioni project in Italy (Demartini et al., 2020), virtual learning within higher education institutions in Pakistan and East Africa (Khamis et al., 2021), and the digital transformation strategy adopted as a method of bridging the digital divide at Nyandarua National Polytechnic (Irungu, 2025).

According to the findings, in terms of Model summary, it identifies that partnership in digital transformation accounts for 37.0% of the variance in

performance of Graffins College (Adjusted $R^2 = 0.370$), indicating that while partnership in digital transformation has a relatively moderate effect on the institutional performance of the College. According to the F-statistics of ($F = 41.524$), this highlights the partnership in digital transformation has significant statistical validity in terms of effectiveness of industry collaboration programs and partnership engagement level. Based on the unstandardized coefficient ($B = 0.452$), it suggests that the effect of partnership in digital transformation demonstrates high explanatory power in explaining organizational performance. Hence, based on these statistical findings, in terms of Dynamic Capability Theory, it suggests that partnership in digital transformation can be detected as opportunity to improve its institutional performance and coordinated according to its digital policy and goverance.

Test of Hypothesis Three

Hypothesis Three (H_{o3}) was determined as that innovation in digital transformation has no influence on the performance of Graffins College. To verify this, the study adopted regression analysis using SPSS, performing the test of the null hypothesis. The results of the test are presented in the following tables.

Table 21

Model Summary for Innovation in digital transformation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.541[a]	0.293	0.283	0.90916

a. Predictors: (Constant), Innovation

According to table 21, it shows that R of 0.541, and Adjusted R Square of 0.283 suggest that the research variables had a moderate positive linear relationship (R=0.541), while suggesting that 28.3% of the variance in the dependent variable (i.e., performance of Graffins College) was explained by the predictors (i.e., innovation) included in the model. The null hypothesis (H_{o3}) that innovation in digital

transformation have no influence on the performance of Graffins College was rejected. It was concluded that innovation had a moderate positive influence on the performance of Graffins College statistically.

It can also be said that the innovation in the digital transformation have less influence on the performance of Graffins College than the two sub-variables, meaning that the college has focused less on adopting the newest digital initiatives, but has utilised the original ones. However, it is noted that the college has not only encouraged the participants to use the generative AI tools, such as ChatGPT, in order to improve their performance, but also adopted digital initiatives for digital inclusion and equity. Going forward, the college should focus on the practical use of digital transformation, given that it's a tertiary college.

Table 22

ANOVA Model for Innovation in digital transformation

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	23.315	1	23.315	28.207	<.001[b]
	Residual	56.207	68	0.827		
	Total	79.521	69			

a. Dependent Variable: Performance of Graffins College
b. Predictors: (Constant), Innovation

According to table 22, The result of the ANOVA test shows that the F-statistic of 28.207 > F-critical (1,68) of 3.99 and the p-value of less than 0.001, indicating that the model was found sufficient to predict the dependent variable (i.e., performance of Graffins College). The model was suitable to predict the performance of Graffins College, while showing that the null hypothesis (H_{o3}) was rejected statistically, because the F-statistic (28.207) exceeded the F-critical (3.99).

The results indicate that innovation has a significant relationship with the college's performance. This implies that innovative use of digital transformation could improve access to digital resources, facilitate knowledge sharing, and strengthen implementation capacity, which in turn supports performance outcomes. In line with prior empirical work, the evidence here suggests that innovative ways of adopting the digital initiatives tend to result in better service quality and operational efficiency (Ali & Nyamboga, 2020; Chen & Roldan, 2021).

Table 23

Coefficients Table for Innovation in digital transformation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.536	0.243		10.418	<.001
	Innovation	0.382	0.072	0.541	5.311	<.001

a. Dependent Variable: Performance of Graffins College

According to table 23, The result of the coefficients table shows an unstandardized coefficient (B) of 0.382 and a p-value of less than 0.001, indicating that a one-unit increase in the independent variable accounted for 38.2% of the variance in the dependent variable (B=0.382). Also, the model was statistically significant ($p<0.001$). The conclusion is that a one-unit increase in innovation and creativity explained 38.2% of the variance in the performance of Graffins College, showing that the null hypothesis (H_{o3}) was rejected.

It is identified that the college encourages the innovative use of generative AI in teaching and learning, meaning that the college has adopted the latest digital

initiatives for inclusion and equity. It is also noted that its e-portal had been updated according to the latest digital initiatives, meaning that the college had followed the current digital trend and adapted its system accordingly. It is remarkable that the college has invested in establishing effective digital infrastructure in order to facilitate virtual learning and improve the quality of the lecture, especially in ICT. The result is also aligned with the previous studies regarding agile use of digital technologies, which have been a result of continuous updates to adapt to the latest innovative digital initiatives, and have contributed to advances in education service delivery and student participation (Chen & Roldan, 2021; Ali & Nyamboga, 2020; Kamau & Omwenga, 2025).

According to the findings, in terms of Model summary, it identifies that innovation in digital transformation accounts for 28.3% of the variance in performance of Graffins College (Adjusted $R^2 = 0.283$), indicating that curriculum innovation and cloud-based platforms has mere influence on its institutional performance. According to the F-statistics of ($F = 28.207$), this highlights the innovation in digital transformation has relatively less significance regarding innovation-driven leadership, which is aligned with the findings in descriptive analysis. Based on the unstandardized coefficient ($B = 0.382$) and the findings in descriptive analysis, it suggests that innovative digital evaluation and generative AI application have less effects to the institutional performance of the College. Hence, based on these statistical findings, in terms of Dynamic Capability Theory, it suggests that the college sensed innovative digital initiatives as the opportunity, applied digital initiatives accordingly, and updated digital platform according to the institutional governance framework in order to contribute to the institutional performance regarding academic effectiveness and branding.

Test of Hypothesis Four

Hypothesis four (H_{04}) was determined as that research and development in digital transformation has any influence on the performance of Graffins College. The results of the test are presented in Table 25.

Table 24

Model Summary for Research and Development in digital transformation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.518[a]	0.268	0.257	0.92514

a. Predictors: (Constant), Research, and Development

According to table 24, it presents that R of 0.518, and Adjusted R Square of 0.257 showed that the research variables had a moderate positive linear relationship (R=0.518), while suggesting that 25.7% of the variance in the dependent variable (i.e., performance of Graffins College) was explained by the predictor (i.e., research and development) included in the model. The null hypothesis (H_{o4}) that research and development in digital transformation does not have a relationship with the performance of Graffins College was rejected. It was concluded that research and development had a moderate positive influence on the performance of Graffins College statistically.

Based on the finding, it could be guessed that research and development in digital transformation are necessary in advancing the quality of teaching services and achieving satisfactory levels of administrative service. Additionally, this implies that the college had supported the research and development in order to expand the adoption of digital transformation and learning opportunities.

Table 25

ANOVA Model for Research and Development in digital transformation

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.322	1	21.322	24.912	<.001[b]
	Residual	58.2	68	0.856		
	Total	79.521	69			

a. Dependent Variable: Performance of Graffins College
b. Predictors: (Constant), Research and development

According to table 25, the ANOVA test shows that the F-statistic of 24.912 > F-critical (1,68) of 3.99 and p-value of less than 0.001, indicating that the model was found sufficient to predict the dependent variable (i.e., performance of Graffins College). It concludes that the model was suitable to predict the performance of Graffins College, while showing that the null hypothesis (H_{o4}) was rejected statistically, because the F-statistic (24.912) exceeded the F-critical (3.99).

Graffins College has supported capacity-building programs in order to develop the community and establish a mutual culture. It is also remarkable that the updated curriculum has improved educational outcomes by encouraging the newest digital initiatives. With regard to the online evaluation system, the college has advanced its performance due to improved accessibility.

Table 26

Coefficients Table for Research and Development in digital transformation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.67	0.233		11.468	<.001

	Research and development	0.397	0.08	0.518	4.991	<.001

a. Dependent Variable: Performance of Graffins College

According to table 26, the coefficients table shows that an unstandardized coefficient of 0.397 and a p-value of less than 0.001, indicating that a one-unit increase in the independent variable accounts for 39.7% of the variance in the dependent variable (B=0.397), and the model was statistically significant ($p<0.001$). Hence, a one-unit increase in innovation and creativity explained 39.7% of the variance in the performance of Graffins College. As a result, the null hypothesis (H_{o4}) was rejected.

Based on the results, it noted that the college has supported capacity-building programs for the users to optimise online learning services and advance their educational outcomes. In terms of education service, it could be said that the service was aligned with Next-Generation Connectivity, meaning that the adopted digital initiatives would contribute to an even brighter future for the college. The impact of the college on students in the global market will also increase. Furthermore, the college has supported the training on the ethical use of digital data in order to protect the users from facing various vulnerabilities.

Accroding to these findings, with regard to Model summary, it identifies that research and development in digital transformation accounts for 25.7% of the variance in performance of Graffins College (Adjusted $R^2 = 0.257$), indicating that the research activities to examine whether digital initiatives or digital transformation actually implemented exhibited relatively weak relationship with institutional performance. According to the F-statistics of ($F = 24.912$), this highlights that the research and development in digital transformation played a relatively limited role in its

performance regarding ongoing monitoring and strategic enhancement, which is consistent with the findings of the descriptive analysis. Based on the unstandardized coefficient (B = 0.397) and the findings of descriptive analysis, it suggests that the college focused on practical digital skills rather than research capacity development such as research publication due to its feature of industry-oriented training. In the context of Kenya's private Technical and Vocational College, where skills training and workforce preparation is prioritized rather than research activities, it suggests that in order to bridge the gap between academic research and industry-oriented training, the college would be recommended to expand the industrial collaborative project for research development in terms of ICT, Cybersecurity, Data Analytics, FinTech that has collected most interests in Kenya (Okiyo&Kihara, 2024; Bartoo et al., 2025; Owino et al., 2025).

Test of Hypothesis Five

Hypothesis five (H_{05}) was determined as that the combined effects of technology-based learning, partnership, innovation, and research and development on the performance of Graffins College. The results of the test are presented in Table 28.

Table 27

Model Summary for the Combined Effects of Digital Transformation Indicators on Performance of Graffins College

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.656[a]	0.431	0.422	0.81583

a. Predictors: (Constant), Digital Transformation
b. Dependent Variable: Performance of Graffins College

According to table 27, it shows that R of 0.656, and Adjusted R Square of 0.422 established that the research variables had a moderate positive linear relationship (R=0.656), while suggesting that 42.2% of the variance in the dependent

variable (i.e., performance of Graffins College) was explained by the predictor (i.e., digital transformation) included in the model. Based on the finding, the null hypothesis (H_{05}) was rejected. It was concluded that all digital transformation indicators had a moderate positive influence on the performance of Graffins College statistically.

Notably, the combined effect is more commendable than adopting a single variable of digital transformation. Although some challenges could occur when operating the combination of the above variables, there is a higher possibility of benefits due to their synergy. Additionally, this result indicates that the combination could contribute to increasing student enrolment and brand loyalty, since the variables complement each other.

Table 28

ANOVA Model for the Combined Effects of Digital Transformation Indicators on Performance of Graffins College

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.262	1	34.262	51.477	<.001[b]
	Residual	45.26	68	0.666		
	Total	**79.521**	**69**			

a. Dependent Variable: Performance of Graffins College

b. Predictors: (Constant), the combined effects of technology-based learning, partnership, innovation, and research and development

According to table 28, The ANOVA test shows that the F-statistic of 51.477 > F-critical (1,68) of 3.99 and p-value of less than 0.001, indicating that the model was found sufficient to predict the dependent variable (i.e., performance of Graffins College). It concludes that the model was suitable to predict the performance of

Graffins College, while showing that the null hypothesis (H_{o5}) was rejected statistically, because the F-statistic (51.477) exceeded the F-critical (3.99).

Multiple effects were found, meaning that the combination of technology-based learning, partnership, innovation, and research and development creates a synergistic effect to improve institutional performance. This discussion is further supported by the finding, F of 51.477, which is considerably greater than the F-Critical of 3.99, indicating that the combined effect was better than the singular application of any single variable of digital transformation.

Table 29

Coefficients Table for the Combined Effects of Digital Transformation Indicators on Performance of Graffins College

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	Std. Error	Beta		
1	(Constant)	2.016	0.253		7.963	0
	Digital Transformation[a]	0.581	0.081	0.656	7.175	0

a. (Constant), Digital Transformation: the combined effects of technology-based learning, partnership, innovation, and research and development

b. Dependent Variable: Performance of Graffins College

According to table 29, the coefficients table shows an unstandardized coefficient of 0.581 and a p-value of less than 0.001, indicating that a one-unit increase in the independent variable accounted for 58.1% of the variance in the dependent variable (B=0.581), and that the model was statistically significant ($p<0.001$). According to this finding, a one-unit increase in digital transformation

variables explained 58.1% of the variance in the performance of Graffins College, showing that the null hypothesis (H_{o5}) was rejected.

Based on the findings (Adjusted R^2=0.422, F-Statistics= 51.477, and B=0.581), it could suggest that the combined effect is much more prominent in some of the variables, such as partnership, innovation, and research and development. This result implies that it might be better to adopt only the technology-based learning rather than the combination of all four variables. The college had focused on distributing virtual learning due to its industry-oriented curriculum and facilitating online administrative services to satisfy both the administrative staff and students in terms of efficiency. Furthermore, the college has shown less interest in interacting with other educational institutions due to its attributes as a tertiary college, but it has adopted the newest digital initiatives and improved the quality of the lectures. However, in a bid to support a combination of four elements mentioned, it would suggest that the college need to prepare the governance and institutional policy to establish the digital ecosystem and reduce the unnecessary hindrance for maximum institutional revenue while seeking the sufficient funding system that underpins this mechanism effectively. Compared to the findings and limitations in previous studies reviewed (Ali and Nyamboga, 2020; Irungu, 2025; Kamau and Omwenga, 2025), it suggests that these findings are upstanding to deal with limited capacity-building program and ethical usage of digital skills once the collaborative system that integrates technology-based learning, partnership, innovation, and research and development in digital transformation establishes.

Chapter Summary

The chapter summarises the findings of the study in terms of response rate, demographic characteristics of respondents, descriptive analysis, diagnostic analysis,

and inferential analysis (i.e., test of hypotheses). All five null hypotheses were rejected, indicating that all digital transformation variables had a positive influence on the performance of Graffins College, specifically technology-based learning, partnership, innovation, research and development, and a combination of all four elements.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS, AND AREAS FOR FURTHER RESEARCH

Introduction

This chapter consists of a summary and discussion of the findings, alongside the conclusions, implications, recommendations, and areas for further research.

Summary of Findings

Demographic Characteristics

This cross-sectional survey examined the influence of digital transformation on the performance of Graffins College. A high response rate (93.3%) was achieved after survey distribution, with a notable gender representation (50.70% male and 42.70% female). In terms of age, the survey mainly involved young adults and students between 18 and 24 years. Regarding position, the majority of the respondents (49.30%) had engaged in certificate courses within six months (69.30%).

Technology-based Learning in digital transformation and Performance of Graffins College

The first objective of the study was to examine the influence of technology-based learning on the performance of Graffins College. To address this objective, both descriptive and inferential analyses were carried out. The mean scores across all items were relatively high, generally exceeding 3, with the standard deviation generally under 1.5. Based on the results, it can be said that the majority of the respondents agreed that technology-based learning had a positive effect on the performance of Graffins College.

Inferential statistics included both correlation and regression analyses. The model summary demonstrated a moderate positive linear relationship between the

variables (R=0.670), while the adjusted R Square of 0.441 suggested that 44.1% of the variance in the technology-based learning contributed to the variance in the performance of Graffins College. The ANOVA model showed an F-statistic of 55.348 greater than F-Critical (1,68) of 3.99 and a p-value of less than 0.001. These statistics contradicted the null hypothesis (H_{01}) and verified that the technology-based learning influenced the performance of Graffins College.

The Coefficients table showed an unstandardised coefficient (Beta) of 0.657 and a p-value of less than 0.001, indicating that a one-unit increase in technology-based learning contributed to 65.7% of the variance in Graffins College's performance (B=0.657). The null hypothesis (H_{o1}) was rejected since technology-based learning had a measurable positive impact on the performance of Graffins College.

These results were mainly underpinned by resource-based view theory, which implied that the college has adopted digital technology, particularly through online learning. The findings mirrored insights from other studies, which suggested that digital transformation, in terms of technology-based learning, has a positive effect on the performance of higher education institutions (Omutange et al., 2025).

Partnership in digital transformation and Performance of Graffins College

The second objective of the study was to examine the relationship between partnership in digital transformation and the performance of Graffins College. To address this objective, both descriptive and inferential analyses were conducted. In terms of descriptive analysis, the findings revealed that the mean scores across all items were relatively low, generally falling under 3, with a standard deviation of generally under 1.6. It can be said that the majority of the respondents disagreed that partnership had an influence on the performance of Graffins College. Based on the findings, it was concluded that the respondents may have had less experience in

participating in programs or activities related to partnership with other institutions or industries pertaining to digital transformation, yet they somewhat agreed that partnership in digital transformation had a positive relationship with the performance of Graffins College.

Both correlation and regression analyses were conducted. The correlation (r) of 0.616 and p-value of less than 0.001 indicated that 61.6% of correlation was found between the partnership in digital transformation and the performance of Graffins College (r=0.616). The ANOVA model also showed an F-statistic of 41.524, which was greater than an F-Critical (1,68) of 3.99 and a p-value of less than 0.001. This suggested that the null hypothesis (H_{O2}) was invalid. The relationship between partnership in digital transformation and the performance of Graffins College was established.

The Coefficients table generated an unstandardised coefficient (Beta) of 0.452 alongside a p-value of less than 0.001. This suggested that a one-unit increase in the partnership resulted in 45.2% of the variance in the performance of Graffins College (B=0.452). The somewhat low positive relationship between the partnership in digital transformation and the performance of Graffins College was verified. Based on these findings, the null hypothesis (H_{o2}) was rejected.

These results were mainly underpinned by dynamic capability theory, which suggested that the college has participated in seminars related to digital transformation strategy (sensing) and adopted effective digital initiatives for performance improvement (seizing and restructuring). The findings reflected data from other studies, which demonstrated that partnership in digital transformation has a positive influence on the performance development of institutions of higher learning in Kenya (Irungu, 2025).

Innovation in digital transformation and Performance of Graffins College

The third objective was to examine the relationship between innovation in digital transformation and the performance of Graffins College. To address this objective, both descriptive and inferential analyses were conducted. In terms of descriptive analysis, the findings revealed that the mean scores across all items were relatively high, generally exceeding 3, with a standard deviation of generally under 1.6. The results indicated that the respondents agreed that innovation in digital transformation had a positive influence on the performance of Graffins College. Based on the findings, it was concluded that the respondents were accustomed to utilising the institution's innovative digital infrastructure and effectively applying the available digital tools.

With regard to the inferential analysis, both correlation and regression analyses were conducted using SPSS. The Pearson Correlation analysis revealed a correlation of $r=0.541$ and a p-value of less than 0.001, indicating a 54.1% correlation between innovation in digital transformation and the performance of Graffins College, which was statistically significant ($p<0.05$). The model summary further revealed a moderate positive linear relationship between innovation in digital transformation and the performance of Graffins College ($R=0.541$), with an Adjusted R Square of 0.283, indicating that 28.3% of the variance in the performance of Graffins College is explained by innovation in digital transformation.

The ANOVA results showed an F-statistic of 28.207 exceeding the F-critical (1,68) of 3.99, with a p-value of less than 0.001, indicating that the null hypothesis (Ho3) was rejected (F-statistic 28.207 > F-critical 3.99) and the model was statistically significant ($p<0.05$). According to the coefficients table, the unstandardized coefficient (Beta) of 0.382 and a p-value of less than 0.001 were

found, indicating that a one-unit increase in innovation in digital transformation contributed to 38.2% of the variance in the performance of Graffins College (B=0.382), which was statistically significant ($p<0.05$). Based on the findings above, it was concluded that the null hypothesis (H_{o3}) was rejected and that innovation in digital transformation had a positive influence on the performance of Graffins College.

The results were mainly underpinned by the educational process reengineering theory, which means that the college has adopted the latest digital initiatives and restructured these according to its policy and conditions. The findings were in agreement with other studies reviewed throughout the study, which examined that innovation in digital transformation have had positive impacts on the performance of higher education institutions in Kenya (Ali & Nyamboga, 2020; Kamau & Omwenga, 2025).

Research and Development in digital transformation and Performance of Graffins College

The fourth objective of the study was to examine the influence of research and development on the performance of Graffins College. To address this objective, both descriptive and inferential analyses were conducted. In terms of descriptive analysis, the findings revealed that the mean scores across all items were relatively low, generally under 3, with a standard deviation of generally under 1.55. It can be said that the majority of the respondents disagreed that research and development in digital transformation had a positive effect on the performance of Graffins College.

With regard to inferential analysis, both correlation and regression analyses were conducted. The Pearson Correlation analysis revealed a correlation of r=0.518 and a p-value of less than 0.001, indicating a 51.8% correlation between research and

development in digital transformation and the performance of Graffins College, which was statistically significant ($p<0.05$).

The model summary revealed a moderate positive linear relationship between the variables ($R=0.518$), while the Adjusted R Square of 0.257 suggests that 25.7% of the variance in the performance of Graffins College is explained by research and development. The ANOVA results also showed an F-statistic of 24.91 that exceeded the F-critical (1,68) of 3.99, with a p-value of less than 0.00. The null hypothesis (H04) was rejected since research and development in digital transformation had a significant relationship with the performance of Graffins College.

According to the coefficients table, an unstandardised coefficient (Beta) of 0.397 was found with a p-value of less than 0.001, indicating that a one-unit increase in research and development in digital transformation contributed to 39.7% of the variance in the performance of Graffins College ($B=0.397$), and the model was statistically significant ($p<0.05$). Based on the findings above, it was concluded that the null hypothesis (Ho4) was rejected, indicating that research and development in digital transformation and the performance of Graffins College had a moderately positive relationship. The results were mainly supported by resource-based view theory, which suggested that the college has optimised its performance by maximising the effects of digital transformation strategies. The findings were consistent with similar studies that have shown that research and development in digital transformation has a positive influence on the performance of institutions of higher learning in Kenya.

Combined Effects of Digital Transformation Indicators On Performance of Graffins College

The fifth objective was to examine the combined effects of technology-based learning, partnership, innovation, and research and development in digital transformation on the performance of Graffins College. To address this objective, both descriptive and inferential analyses were conducted. In terms of descriptive analysis, the findings revealed that the mean scores across all items were relatively high, generally exceeding 3.6, with a standard deviation of under 1.4. The results indicated that the respondents agreed that digital transformation had a strong positive influence on the performance of Graffins College. Based on the findings, it was concluded that the respondents were satisfied with the digital transformation implemented within the College. With regard to the inferential analysis, both correlation and regression analyses were conducted. The Pearson Correlation analysis revealed a correlation of $r=0.656$ and a p-value of <0.001 between digital transformation and the performance of Graffins College, indicating a 65.6% correlation between the two variables, which was statistically significant ($p<0.05$).

The model summary revealed a strong positive linear relationship between digital transformation and the performance of Graffins College ($R=0.656$), with an Adjusted R Square of 0.422, indicating that 42.2% of the variance in the performance of Graffins College is explained by digital transformation. The ANOVA results showed an F-statistic of 51.477 exceeding the F-critical (1,68) of 3.99, with a p-value of less than 0.001, indicating that the null hypothesis (H_{o5}) was rejected (F-statistic 51.477 > F-critical 3.99) and the model was statistically significant ($p<0.05$).

According to the coefficients table, an unstandardised coefficient (Beta) of 0.581 and a p-value of less than 0.001 were found, indicating that a one-unit increase

in digital transformation contributed to 58.1% of the variance in the performance of Graffins College (B=0.581), and the model was statistically significant ($p<0.05$). Based on the findings above, it was concluded that the null hypothesis (H_{o5}) was invalid and that digital transformation had a strong positive influence on the performance of Graffins College.

The results were mainly underpinned by resource-based view theory, which indicates that the college has considered a combination of technology-based learning, partnership and collaboration, innovation and creativity, and research and development as its competitive resources in order to develop its institutional performance. The findings were in agreement with existing literature, which posited a combination of technology-based learning, partnership, innovation, and research and development in digital transformation as beneficial to the performance of higher education institutions in Kenya (Ali and Nyamboga, 2020; Irungu, 2025; Omutange et al., 2025; Kamau and Omwenga, 2025; Odhiambo, 2025).

Conclusions

The study aimed to examine the influence of digital transformation on the performance of institutions of higher education within Nairobi County in Kenya: A Case study of Graffins College. To examine the strengths, limitations, and challenges of implementing digital transformation within the institute, this study conducted a cross-sectional survey as research method through structured questionnaire, followed by descriptive and inferential analyses consisting of Pearson correlation and regression analysis. The overall finding was that digital transformation, consisting of technology-based learning, partnership, innovation, and research and development, was statistically related to the performance of Graffins College.

These findings resulted in that digital transformation, regarding technology-based learning, partnership, innovation, research and development, and the combination of above four elements, has a positive relationship with the performance of Graffins College. However, as delving into the details, the following insights can be driven out according to each objective of the research. In terms of technology-based learning, based on the finding in descriptive analysis, it says that the respondents agreed the highest to the mobile learning platforms (M= 3.76) and digital device accessibility (M=3.76), the moderate to blended learning (M=3.63), digital learning accessibility (M=3.46), and online learning (M=3.19), but the least to online assessments (M=2.76). These findings could draw the results that online, mobile, and blended learning contributed positively to the performance of the college, while there were significant limitations in the implementation of online assessment regarding insufficient internet connectivity and lack of institutional capacity building support. Further, these findings were aligned with the findings in correlation analysis (r of 0.670) and regression analysis (0.441 of Adjusted R Square and 0.657 of B), identifying that positive statistical causation between research variables was found, but the figure for each is high moderate because of the limitations mentioned. Thus, this study ensures to examine the first objective of this study; to explore the influence of technology-based learning in digital transformation on the performance of Graffins College.

With regard to partnership in digital transformation, regarding descriptive analysis, it was found that the respondents agreed to the highest to the cross-cultural communication (M=2.76) the moderate to collaborative capacity-building program (M=2.57), collaborative learning (M=2.53), strategic partnership (M=2.56), and the least to digital transformation webinar (M=2.31). Based on the findings, it can say

that although the college offered e-learning through digital transformation strategies adopted from the government, tech industries, and educational institutions, challenges in engaging in webinars and supporting capacity-building programs with industry and educational institutions were identified. These findings in descriptive analysis were aligned with the findings in correlation analysis (r of 0.616) and the findings in regression analysis (Adjusted R Square of 0.370, Unstandardized Coefficients of 0.452), indicating that partnership in digital transformation is relatively less relate with the performance of Graffins College, although the positive relationship between two variables was statistically found. Hence, in this research, the second objective is adequately dealt with that partnership in digital transformation have mere positive effects on the performance of Graffins College.

Regarding innovation in digital transformation, based on the finding in descriptive analysis, it says that AI, IoT, and Big data had the highest mean score (M=3.57), followed by e-portal, agile digital infrastructure establishment, and digital inclusion and equity with a moderate mean score (M=3.29, 3.27, and 3.26 respectively), whereas generative AI had the lowest mean score (M=2.49). These findings revealed that the college encouraged users to optimise AI, IoT, and Big Data for teaching and learning. This ensured that students, staff, and faculty adopted the latest digital initiatives for inclusion and equity, especially after establishing an e-portal to boost accessibility. There were, however, several limitations in terms of training and capacity building program for digital literay because of a lack of understanding a need of generative AI tools and adherence to conventional teaching styles rather than updated teaching technologies. These findings are aligned with the finding in correlation analysis (r=0.541) and the findings in regression analysis (Adjusted R Square of 0.283 and B of 0.382), indicating that the college has

established industry-integrated digital skill training program and modular digital training infrastructure, and these digital initiatives contributed to performance improvement at a low moderate level. Thus, this study ensures to examine the third objective of this study; to examine the effects of innovation in digital transformation on the performance of Graffins College.

In terms of research and development in digital transformation, based on the findings in descriptive analysis, it was found that the respondents agreed to the highest to capacity building program (M=2.70), and moderate to digital-oriented curriculum and e-assessmentit (M= 2.69 and 2.66 respectively), indicating that the college has supported capacity-building programs for user training based on an updated curriculum on digital initiatives and the e-evaluation service. But there was a lack of awareness of AI services among users, as well as limited understanding of digital policy. Further, based on the low figures throughout the overall mean, it can be said that the college would support less innovation in digital transformation comparatively. These findings are aligned with the finding in correlation analysis (r=0.518) and the findings in regression analysis (Adjusted R Square=0.257 and B =0.397), meaning that although there is a statistical evidence to support innovation in digital transformation havs influence on the performance of Graffins College, its impact seems like weaker than others. Hence, this study ensures to examine the fourth objective of this study; to establish the influence of research and development in digital transformation on the performance of Graffins College.

Lastly, concerning a combination of above four sub-independent variables, based on the finding in correlation analysis (r= 0.656), it could say that it would be better that a combination of the variables can be able to result in better performance except technology-based learning, which has higher pearson correlation (r=0.670)

than this. Also, based on the highest finding (r=0.829), partnership and research and development in digital transformation have the highest correlation to produce the best results followed by partnership and teaching-based learning (r=0.730) whereas based on the least finding (r=0.664), technology-based learning and research and development can be regarded as the worst partner. These findings can result in that collaborative e-learning program with institutions of higher learning and virtual global conference could result in the best synergy effects. These findings are aligned with the findings in regression analysis (Adjusted R Square of 0.422 and Unstandardized Coefficients of 0.581), indicating that the combinated effects of four sub-independent variables to the performance of Graffins College are better than the effect of a single mode application. Thus, this study ensures to examine the fifth objective of this study; to evaluate the combined effects of technology-based learning, partnership, innovation, and research and development on the performance of Graffins College.

In summary, it is reasonable to conclude that digital transformation is a critical predictor of performance at tertiary colleges. However, a discrepancy exists between the availability of digital tools and the strategic depth of their usage. While Graffins College excels in providing 'hard' infrastructure (platforms, devices), it lags in 'soft' infrastructure (partnerships, AI literacy, cross-cultural integration). Therefore, for digital transformation to translate into holistic performance, the focus must shift from mere adoption to strategic integration.

Implications

The study contributes to empirical evidence to Kenya’s higher education sector by investigating how digital transformation works within one of the tertiary technical colleges in Nairobi County: Graffins College. The survey findings provide both lecturers and learners with valuable insights and guidelines for implementing

digital initiatives in practice. The study also adds practical evidence to the existing literature by examining the influence of digital transformation on tertiary technical colleges in Kenya and establishing that colleges can overcome the challenges they have faced. Furthermore, government and educational institutions, especially in terms of strategic development, can rely on the findings to develop new digital transformation strategies to persuade public and private universities to fully adopt digital technologies to enhance performance.

Recommendations

According to the review regarding realities of Kenya's higher learning, in order to deal with high unemployement, financial instability, and governance challenges, it is recommended that policymakers establish a national managerial policy for colleges to adopt the latest technological initiatives, so that Kenya's higher learning institutions can enhance customer satisfaction in terms of the quality of teaching and learning, brand value, and student enrolment. Based on the conclusions, the policymakers need to establish digital learning ethics policy for acceptable GenAI use, data protection, cybersecurity responsibilities, and online evaluation integrity in a bid to prevent the users from exploiting data illegally and increase their credibility of applying digital skills into their own works. They would be recommended that policymakers undertake the proposed phases in sequence, beginning with digital learning government policy formulation, digital learning standards establishment, monitoring, and policy reviews for update. In addition, lecturers should adopt the government's 2025 digital initiatives policy, as well as best practices from other institutions, including AI services such as automated assessment tools, language analytics systems for personalised learning, and AI tutors, to enhance performance and satisfaction with services. This will also improve teaching and learning efficiency

and overall academic performance. In terms of administrative service, it is recommended that managers support seminars or capacity-building for staff to improve their digital literacy level and adopt the latest digital transformation strategies. Also, they would be recommended to establish open digital governance dashboards regarding sharing real-time information on institutional performance with the administrators in order to develop administrative efficiency and conduct real-time evaluation of digital transformation implemented. Also, in terms of capacity-building program, they woud be recommended to establish Institutional Digital Skills Development Units (DSDUs) to coordinate, deliver, and monitor continuous digital capacity-building. Further, regarding unemployment, it would suggest that they try to reinforce digital course and competency-based certification program by enhancing graduates' employability and facilitating stronger alignment with industry requirements. On the other hand, due to limited funding, there might be limitations to implement all the recommendations suggested so that the adminstrators would also be recommended to look for adequate financial source and collaborative programmes with big-tech companies and universities to be supported by sharing knowledge and manpowers with each other and making synergy effects.

Areas for Further Research

Although the study evaluated the influence of digital transformation on the performance of Graffins College, generalizability is limited to similar higher learning institutions. There is a need to conduct further research on institutions with different characteristics to ensure a bright future for digital transformation in Kenya's higher education sector. Future studies should include thorough experiments on implementing digital transformation within institutions of higher learning, especially across other departments such as business, dental, and hospitality. The goal should be

to generate empirical evidence that contributes to further improvement in the performance of higher learning institutions in Kenya. To address the time limitations of this study, future studies should use a longitudinal research design to measure long-term impacts within the same research context. A mixed-methods approach is also recommended to examine the impact of digital transformation on higher education institutions from various perspectives. The resulting knowledge will reflect the current realities and challenges in digital transformation within such institutions. Additionally, a comparative study between private and public TVET institutions in Nairobi would provide a broader understanding of the digital divide and mitigate the limitation of this study concerning the generalizability of its findings, which is constrained by its single-site focus.

Chapter summary

This chapter summarized the findings and clarified conclusions, implications, and recommendations, and then suggested the areas for further research.

REFERENCES

Al-Fraihat, D., Joy, M., & Sinclair, J. (2020). *Evaluating E-learning systems success: An empirical study*. Computers in Human Behavior, 102, 67–86. https://doi.org/10.1016/j.chb.2019.08.004

Ali, H. A., & Nyamboga, T. O. (2020). Adoption of digital literacy strategy on academic progress of private university education in Kenya: A survey of Umma University, Garissa Campus. *Asian Journal of Economics, Business and Accounting, 19*(2), 30–40. https://doi.org/10.9734/ajeba/2020/v19i230300

Almeida, F., & Simoes, J. (2019). The role of serious games, gamification and industry 4.0 tools in the education 4.0 paradigm. *Contemporary Educational Technology, 10*(2), 120-136.

Alnagrat A. J. A., Ismail, R. C., Idrus, Z. S., Abukhatowah, U. A. I., & Gopalan, V. (2022). The impact of digitalisation strategy in higher education: technologies and new opportunities. *International Journal of Business and Technopreneurship*, *12*(1), 79-94.

Al-Taweel, F. B. H., Abdulkareem, A. A., Gul, S. S., & Alshami, M. L. (2020). Evaluation of technology-based learning by dental students during the pandemic outbreak of coronavirus disease 2019. *European Journal of Dental Education*, *25*(1), 183-190. https://doi.org/10.1111/eje.12589

Anandhi, P., & Nathiya, E. (2023). Application of linear regression with their advantages, disadvantages, assumption and limitations. *International Journal of Statistics and Applied Mathematics, 8*(6), 133–137. https://doi.org/10.22271/maths.2023.v8.i6b.1463

Appels, L., De Maeyer, S., Faddar, J., & Van Petegem, P. (2022). Capturing quality. Educational quality in secondary analyses of international large-scale assessments: a systematic review. *School Effectiveness and School Improvement, 33*(4), 629-668.

Arokiasamy, A. R. A. (2021). A study on the quality of academic services in private higher education institutions in Malaysia. *Journal of Education and e-Learning Research, 8*(1), 60–65. https://doi.org/10.20448/journal.509.2021.81.60.65

Asogwa, B. C., Umeh, J. C., & Penda, S. T. (2012). Technical efficiency analysis of small-holder farmers in rural and peri-urban areas of Nigeria. *Journal of Human Ecology*, *37*(1), 57–66. doi.or

Barasa, P. L. (2021). *Digitalization in teaching and education in Kenya*. International Labour Organization.

Bartoo, H., Warui, S., & Kasisi, R. (2025). *Financial Technology Adoption and Technical Efficiency of Commercial Banks in Kenya*. Journal of Finance and Accounting, *13*(2).

Benavides, L. M. C., Arias, J. T., Serna, M. D. A., Bedoya, J. W. B., & Burgos, D. (2020). Digital transformation in higher education institutions: A Systematic literature review. *Sensors*, *20*(11), 3291. https://doi.org/10.3390/s20113291

Bianchi, C., &Caperchione, E. (2022). Performance management and governance in public universities: Challenges and opportunities. *SIDREA Series in Accounting and Business Administration*, *1*(1), 1–14. https://doi.org/10.1007/978-3-030-85698-4_1

Blankenberger, B., & Williams, A. M. (2020). COVID and the impact on higher education: The essential role of integrity and accountability. *Administrative*

Theory & Praxis, *42*(3), 404–423. https://doi.org/10.1080/10841806.2020.1771907

Božič, K., & Dimovski, V. (2019). Business intelligence and analytics use, innovation ambidexterity, and firm performance: A dynamic capabilities perspective. *Journal of Strategic Information Systems*, *28*(4), Article 101578. https://doi.org/10.1016/j.jsis.2019.101578

Chao, C. (2019). Factors determining the behavioural intention to use Mobile Learning: an application and extension of the UTAUT model. *Frontiers in Psychology, 10*, Article 1652. https://doi.org/10.3389/fpsyg.2019.01652

Chen, Y., & Roldan, M. (2021). Digital Innovation during COVID-19: Transforming Challenges to Opportunities. *Communications of the Association for Information Systems*, *48*, 15–25. https://doi.org/10.17705/1cais.04803

Cheruiyot, D. K. (2024). Technology in the Classroom:Evaluating its impact on TVET Institutions in Kenya. *Zenodo (CERN European Organization for Nuclear Research)*. https://doi.org/10.5281/zenodo.17242126

Chwialkowska, A. (2020). Maximizing cross-cultural learning from exchange study abroad programs: Transformative learning theory. *Journal of Studies in International Education*, *24*(5), 535–554. https://doi.org/10.1177/1028315320906163

Cinquini, L. & Mauro, S.G. (2023). A research on digitalization and performance in higher education between hybridity and algorithms. *Handbook of Big Data and Analytics in Accounting and Auditing*. 463-489.

Cloete, N., Bunting, I., & van Schalkwyk, F. (Eds.). (2018). *Research universities in Africa*. African Minds.

Cosenz, F. (2022). Performance systems in higher education institutions. In *Managing Sustainable Performance and Governance in Higher Education Institutions* (pp. 1-36). Springer.

Costa, R. P., Novas, J. C., Fialho, A., & Moreira, P. S. (2023). Using student participation to improve higher education models. *Advances in higher education and professional development book series*, 181–195. https://doi.org/10.4018/978-1-6684-7327-6.ch011

Creswell, J. W., & Creswell, J. D. (2018). *Research design* (5th ed.). SAGE Publications.

Dabas, P. (2024). *Descriptive and inferential statistics using R: Hands-on Examples with Practice Exercises and Solutions*. Sultan Chand & Sons.

Daniel, M. (2022). Relationship between marketing strategies and firm performance of food and beverage processing companies in Kenya. *International Journal of Scientific and Research Publications*, *12*(7), 603–607. https://doi.org/10.29322/ijsrp.12.07.2022.p12766

Demartini, C. G., Benussi, L., Gatteschi, V., & Renga, F. (2020). Education and digital transformation: The "Riconnessioni" project. *IEEE Access*, *8*, 186233–186256. https://doi.org/10.1109/access.2020.3018189

Farias-Gaytán, S. C., Aguaded, I., & Ramírez-Montoya, M. S. (2021). Transformation and digital literacy: Systematic literature mapping. *Education and Information Technologies*, *27*(2), 1417–1437. https://doi.org/10.1007/s10639-021-10624-x

Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: Opportunities and challenges in emergency situations. *Societies, 10*(4), Article 86. https://doi.org/10.3390/soc10040086

Findler, F., Schönherr, N., Lozano, R., Reider, D., &Martinuzzi, A. (2019). The impacts of higher education institutions on sustainable development.

International Journal of Sustainability in Higher Education, *20*(1), 23–38. https://doi.org/10.1108/ijshe-07-2017-0114

Gerhart, B., & Feng, J. (2021). The resource-based view of the firm, human resources, and human capital: Progress and prospects. *Journal of Management*, *47*(7), 1796–1819. https://doi.org/10.1177/0149206320978799

Getuno, D. M. (2022). Towards a digital transformation agenda for teaching, learning and assessment in higher education: The case of Egerton University, *Kenya*. In *Proceedings of the 14th Biennial International Conference of Egerton University*. Egerton University, Njoro, Kenya.

Ghosh, S. K., Hughes, M., Hodgkinson, I. R., & Hughes, P. (2022). Digital transformation of industrial businesses: A dynamic capability approach. *Technovation*, *113*, Article 102414. https://doi.org/10.1016/j.technovation.2021.102414

Gkrimpizi, T., Peristeras, V., &Magnisalis, I. (2023). Classification of barriers to digital transformation in higher education institutions: Systematic literature review. *Education Sciences*, *13*(7), 746. https://doi.org/10.3390/educsci13070746

Gosselin, R. (2024). Testing for normality: a user's (cautionary) guide. *Laboratory Animals*, *58*(5), 433–437. https://doi.org/10.1177/00236772241276808

Habib, M. (2023). Digital transformation strategy for developing higher education in conflict-affected societies. *Social Sciences & Humanities Open*, *8*(1), Article 100627. https://doi.org/10.1016/j.ssaho.2023.100627

Hammer, M., & Champy, J. (1993). *Reengineering the corporation: A manifesto for business revolution*. Harper Business.

Hashim, M. M., Tlemsani, I., & Matthews, R. (2021). Higher education strategy in digital transformation. *Education and Information Technologies*, *27*(3), 3171-3195. https://doi.org/10.1007/s10639-021-10739-1

Hatos, A. (2019). The impact of digitalization on educational achievement: A literature review from a sociological perspective. *Calitatea Vietii,1*, 3-16.

Ingosi, M. T., Odero, J. A.,& Ali, U. (2024). Financial resources and performance of public universities in Kenya. *Journal of Accounting and Finance in Emerging Economies*. *10*(3), 481–496. http://www.publishing.globalcsrc.org/jafee

Irungu, C. W. (2025). Bridging the digital divide: Enhancing workforce readiness through technology integration in Kenyan TVET Institutions. *Journal of Education Management and Leadership (JEML)*, *4*(1), 78–92. https://doi.org/10.51317/jeml.v4i1.817

Iruthayasamy, L. (2021). The resource-based view. *Springer eBooks,* 63–74. https://doi.org/10.1007/978-981-33-6542-1_4

Issa, A. O., & Aliyu, M. B. (2018). User education programmes, resources availability and use: The experience of college of education students in Kwara State. *Information Impact: Journal of Information and Knowledge Management*, *9*(2), 24–36. doi.org

Itzkowitz, M., Murdock, K., Dimino, M., & Navarro, E. (2023). *The State of American higher education outcomes in 2023.* THIRD WAY.

Janeesh, J., Presthienalofi, E. L., Leena, M. L., Nair, M. K. C.,& Ajithkumar, K. (2019). Literature Review in Research. *The official Journal of Kerala University of Health Sciences*, 66-75.

Kagwe, S. (2025). Influence of Self-Awareness on organizational performance of universities in Kenya. *African Journal of Business and Development Studies*, *2*(1), 593–604. https://doi.org/10.70641/ajbds.v2i1.166

Kamau, J. K., & Omwenga, J. (2025). Digitalization and service delivery in the Ministry of ICT and Digital Economy, Kenya. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME), 9*(1), 1-18. https://www.sagepublishers.com/index.php/ijssme/article/view/885

Karabatak, S. & Alanoglu, M. (2021). Digital transformation and educational organizations. *Education & Science*, 7-22.

Karanja, P., & Mutua, J. (2020). Determinants of student satisfaction in private universities in Kenya: A structural equation modeling approach. *International Journal of Educational Management, 34*(4), 745-760. https://doi.org/10.1108/IJEM-12-2019-0421

Kenya National Bureau of Statistics. (2026). *Economic Survey 2026*. Kenya National Bureau of Statistics.

Khamis, T., Naseem, A., Khamis, A., &Petrucka, P. (2021). The COVID-19 pandemic: A catalyst for creativity and collaboration for online learning and work-based higher education systems and processes. *Journal of Work-applied Management*, *13*(2), 184-196. https://doi.org/10.1108/jwam-01-2021-0010

Kibet, K. A. (2025). Integrating digital literacy and competency-based curriculum in higher education: A Framework for 21st century entrepreneurship education in Kenya. *East African Journal of Education Studies*, *8*(2), 702–711. https://doi.org/10.37284/eajes.8.2.3158

Kim, J. H. (2019). Multicollinearity and misleading statistical results. *Korean Journal of Anesthesiology*, *72*(6), 558–569. https://doi.org/10.4097/kja.19087

Kiriri, P. N. (2022). Management of performance in higher education institutions: The application of the balanced scorecard (BSC). *European Journal of Education*, *5*(1), 141–154. https://doi.org/10.26417/158crg70k

Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). *Digital transformation: An overview of the current state of the art of research*. SAGE Open, 11(3). https://doi.org/10.1177/21582440211047576

Kumi-Yeboah, A., Kim, Y., & Armah, Y. E. (2023). Strategies for overcoming the digital divide during the COVID-19 pandemic in higher education institutions in Ghana. *British Journal of Educational Technology, 54*(5), 1234-1256. https://doi.org/10.1111/bjet.13356

Kuzu, O. (2020). Digital transformation in higher education: A case study on strategic plans. *VysšeeObrazovanie V Rossii*, *29*(3), 9–23. https://doi.org/10.31992/0869-3617-2019-29-3-9-23

Lame, G. (2019). Systematic literature reviews: An introduction. *Proceedings of the Design Society: International Conference on Engineering Design, 1*(1), 1633-1642. https://doi.org/10.1017/dsi.2019.169

Langthaler, M. &Bazafkan, H. (2020). *Digitalization, education and skills development in the global South: An assessment of the debate with a focus on Sub-Saharan Africa.* Austrian Foundation for Development Research (OFSE Working Paper No. 28). http://hdl.handle.net/10419/228970

Levy, P. S., & Lemeshow, S. (2013). *Sampling of populations: Methods and applications* (4th ed.). Wiley.

Linnenluecke, M. K., Marrone, M., & Singh, A. K. (2019). Conducting systematic literature reviews and bibliometric analyses. *Australian Journal of Management*, *45*(2), 175-194. https://doi.org/10.1177/0312896219877678

Maingi, S. W. (2020). Case study 6: Mainstreaming overtourism education for sustainable behavioral change in Kenya's tourism industry context. *Springer eBooks*, 383–399. https://doi.org/10.1007/978-3-030-42458-9_20

Mann, D., Chokshi, S., Lebwohl, R., Mainiero, M., Dinh-Le, C., Driscoll, K., Robinson, S., & Egger, H. L. (2019). Building digital innovation capacity at a large academic medical center. *Npj Digital Medicine*, *2*(1), Article 88. https://doi.org/10.1038/s41746-019-0088-y

Maobe, A., & Peng, L. (2020). Higher education reforms in Kenya: Options and development. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3524744

Maphalala, M. C., & Adigun, O. T. (2020). Academics' experience of implementing E-Learning in a South African higher education institution. *International Journal of Higher Education*, *10*(1), 1–12. https://doi.org/10.5430/ijhe.v10n1p1

Mbote, P. K. (2019). *Drivers of performance excellence in universities in Kenya*. Dedan Kimathi University of Technology.

Meteshkin, K. O., Morozova, O., & Pomortseva, O. (2021). The results of department educational processes reengineering in dual and digital education concepts. *Radìoelektronnì Ì Komp'ûternìSistemi*, *1*, 92-100. https://doi.org/10.32620/reks.2021.1.08

Mouha, R. A. (2021). Internet of Things (IoT). *Journal of Data Analysis and Information Processing*, *09*(02), 77–101. https://doi.org/10.4236/jdaip.2021.92006

Mpofu, R., & Nicolaides, A. (2019). Frankenstein and the fourth industrial revolution (4IR): ethics and human rights considerations. *African Journal of Hospitality, Tourism and Leisure, 8*(5), 125. https://www.ajhtl.com/uploads/7/1/6/3/7163688/article71vol852019unisa.pdf

Mugenda, O. & Mugenda, A. (2019). *Research methods: Qualitative and quantitative approaches*. African Centre for Technology Studies (ACTS).

Mukenye, C., Sichari, M. B., & Opiyo, R. (2025). Influence of academic motivation on online learning outcomes among students in public universities in the Western Region of Kenya. *African Journal of Empirical Research, 6*(3), 793–807. https://doi.org/10.51867/ajernet.6.3.60

Mulyadi, M., Tonapa, S. I., Rompas, S. S. J., Wang, R., & Lee, B. (2021). Effects of simulation technology-based learning on nursing students' learning outcomes: A systematic review and meta-analysis of experimental studies. *Nurse Education Today*, *107*, Article 105127. https://doi.org/10.1016/j.nedt.2021.105127

Mwangi, M., & Gikunda, R. (2022). Administrative efficiency and service delivery in Kenyan private universities: A case of selected institutions in Nairobi County. *African Journal of Education and Practice, 8*(3), 22–33. https://doi.org/10.37284/ajep.8.3.112

Mwangi, M., & Khasakhala, L. (2022). Learning environments and their impact on student performance in private universities in Kenya. *African Journal of Education Studies, 8*(1), 55–68.

Nafsi, F. A. (2023). *Ethical considerations in conducting research for thesis: Students' beliefs and practices* (Unpublished bachelor's thesis). UIN Ar-Raniry Fakultas Tarbiyah dan Keguruan.

National Institute of Standards and Technology [NIST]. (2021). *2021-2022 Baldrige Performance Excellence Framework Criteria Commentary*. https://www.nist.gov/baldrige

Nayal, P., Pandey, N., & Paul, J. (2021). Covid-19 pandemic and consumer-employee-organization wellbeing: A dynamic capability theory approach. *Journal of Consumer Affairs*, *56*(1), 359–390. https://doi.org/10.1111/joca.12399

Ndarwa, H., & Mulinge, D. (2023). Operationalizing Transformational leadership Components: Impact on commercial banking strategies in Nairobi County. *International Journal of Multidisciplinary Research and Analysis*, 6(9), 123-132. https://doi.org/10.47191/ijmra/v6-i9-14

Oanda, I. O. (2022). Reimagining student experience in Kenyan private universities: Digital transformation and quality assurance. *Journal of Higher Education in Africa, 20*(1), 85–102.

Ochola, A. G., Lawrence, O., & Doreen, N. (2024). Balanced scorecard and performance of private chartered universities in Kenya. *CUEA Journal of Business and Economics*, *1*(1), 1–12. https://journal.cuea.edu/ojs1/index.php/cjb/article/view/33

Odhiambo, O. P. (2025). *Rethinking Kenya's National Digital Master Plan (NDMP, 2022–2032): Knowledge economy or epistemic exploitation?* The University of Nairobi, Kenya.

OECD. (2022). Digital higher education: Emerging quality standards, practices and supports. In *OECD Education Working Papers* (No. 281). https://doi.org/10.1787/f622f257

Okiyo, E., & Kihara, A. (2024). *Effect of Organization Capabilities on the Growth of Fintech Providers in Kenya*. Journal of Business and Strategic Management.

Omollo, B. A., & Otieno, S. (2023). The role of digital learning resources on student academic performance in Nairobi-based universities. *Journal of Educational Technology and Innovation, 5*(2), 45-59. https://doi.org/10.1108/JETI-02-2023-0059

Omondi, A.O., Were, S., & Kamaku, W. (2019). Influence of digital learning acceptability on educational outcomes among primary school pupils in Nairobi City County, Kenya. *International Journal of Novel Research in Computer Sciences and Software Engineering. 6*(1), 1-16. www.noveltyjournals.com

Omutange, E., Mutai, W., & Barasa, V. (2025). Impact of integration of modern digital technology platforms in teaching and learning at the Technical and Vocational Education and Training (TVETs) in Kenya. *American Journal of Education and Information Technology*, *9*(1), 1–10. https://doi.org/10.11648/j.ajeit.20250901.11

Ongoma, J., Anekeya, A. D., & Okuto, E. (2021). Optimal allocation in small area mean estimation using stratified sampling in the presence of non-response. *International Journal of Statistical Distributions and Applications*, 7(1), 13-24.

Organisation for Economic Co-operation and Development [OECD]. (2021). *OECD digital education outlook 2021: Pushing the frontiers with artificial intelligence, blockchain and robots*. https://doi.org/10.1787/589b283f-en

Owino, B., Oduor, C., & Chege, G. (2025). *An Empirical Assessment of Cybersecurity Maturity in Higher Learning Institutions*. Kabarak Journal of Research & Innovation, *15*(2).

PAL Network. (2021). *Kenya education sector stakeholders*. https://palnetwork.org/wpfd_file/stakeholder-mapping-report-revised-v4/

Paladan, N. N. (2018). Higher education institutions embracing digital & social media marketing: A case of top 25 universities in Asia & Africa. *Social Science Research Network*. https://doi.org/10.2139/ssrn.3347018

Pasaribu, R. D., Anggadwita, G., Hendayani , R., Kotjoprayudi, R. B., & Apiani, D. I. N. (2021). Implementation of business process reengineering (BPR): Case study of official trip procedures in higher education institutions. *Journal of Industrial Engineering and Management*, *14*(3), Article 622. https://doi.org/10.3926/jiem.3403

Penrose, E. T. (1959). *The theory of the growth of the firm*. Basil Blackwell.

Pokrovskaia, N. N., Ababkova, M. Y., & Fedorov, D. A. (2019). Educational services for intellectual capital growth or transmission of culture for transfer of knowledge—consumer satisfaction at St. Petersburg Universities. *Education Sciences*, *9*(3), Article 183. https://doi.org/10.3390/educsci9030183

Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review, 68*(3), 79–91.

Rasheed, R. A., Kamsin, A., & Abdullah, N. A. (2020). Challenges in the online component of blended learning: A systematic review. *Computers & Education, 144,* Article 103701. https://doi.org/10.1016/j.compedu.2019.103701

Republic of Kenya. (2021). *Education sector report: Medium term expenditure framework 2022/23–2024/25*. Republic of Kenya.

Riany, K., Onsomu, M., Mutuma, A., & Radol, A. (2025). Comparative analysis of e-readiness and e-learning integration in Kenyan universities using the unified theory of acceptance and use of technology-2. *Higher Education Research*, *10*(4), 157-175. https://doi.org/10.11648/j.her.20251004.14

Sanders, J., & Wong, T. (2020). International partner selection among higher education institutions in Hong Kong, Singapore and Japan: A resource-based view. *Journal of Higher Education Policy and Management*, *43*(2), 214–229. https://doi.org/10.1080/1360080x.2020.1774097

Sarrico, C. S. (2022). Quality management, performance measurement and indicators in higher education institutions: between burden, inspiration and innovation. *Quality in Higher Education*, *28*(1), 11-28. https://doi.org/10.1080/13538322.2021.1951445

Sarrico. C. S. (2020). Performance indicators in higher education. *The International Encyclopedia of Higher Education Systems and Institutions*, 2219-2222. https://doi.org/10.1007/978-94-017-9553-1

Schmidt, J., & Min, T. (2020). Digitalization in education: Challenges, trends and transformative potential. *Springer eBooks*, 287–312. https://doi.org/10.1007/978-3-658-28670-5_16

Segura, E. A., Zamar, M. D. G., Moro, J. C. I., & García, G. R. (2020). Sustainable management of digital transformation in higher education: Global research trends. *Sustainability*, *12*(5), Article 2107. https://doi.org/10.3390/su12052107

Seriki, O. (2020). Resource-based view. In *Springer eBooks* (pp. 1–4). https://doi.org/10.1007/978-3-030-02006-4_469-1

Shahbaz, M., Chandio, A. F., Oad, M., Ahmed, A., & Ullah, R. (2018). Stakeholders' management approaches in construction supply chain: a new perspective of stakeholder theory. *International Journal of Sustainable Construction Engineering and Technology*, *9*(2),145-156.. https://doi.org/10.30880/ijscet.2018.09.02.002

Singh, A. (2022). Digital transformation in education. *Evolution of Digitized Societies Through Advanced Technologies*, 19–32. https://doi.org/10.1007/978-981-19-2984-7_3

Singh, V., & Thurman, A. C. (2019). How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018). *American Journal of Distance Education, 33(*4), 289–306. https://doi.org/10.1080/08923647.2019.1663082

Sousa, R. D., Karimova, B., & Gorlov, S. M. (2020). Digitalization as a new direction in education sphere. *E3S Web of Conferences*, *159*, Article 09014.https://doi.org/10.1051/e3sconf/202015909014

Spielman, D., Lecoutere, E., Makhija, S., & Van Campenhout, B. (2021). Information and Communications Technology (ICT) and agricultural extension in developing countries. *Annual Review of Resource Economics*, *13*(1), 177–201. https://doi.org/10.1146/annurev-resource-101520-080657

Statistics Canada. (2020, December). *Section 4: Sample size determination*. In *Survey Methodology* (Catalogue No. 12-001-X). Statistics Canada. https://www150.statcan.gc.ca/n1/pub/12-001-x/2020002/article/00001-eng.pdf

Surahman, S., Pratiwi, R., Imron, A., Cakranegara, P.A.,& Putra, P. (2022). Multicultural education in the forming of social character in the digitalization era. *Jurnal Pendidikan Islam dan Multikulturalisme, 4*(3), 162-174.

Takamatsu, K., Noda, I., Bannaka, K., Murakami, K., Kozaki, Y., Mitsunari, K., Omori, M., & Nakata, Y. (2022). A new concept of digital transformation, institutional research, and information and communication technology in higher education based on Eduinformatics. *Lecture Notes in Networks and Systems*, 233–240. https://doi.org/10.1007/978-981-19-2397-5_23

Technical and Vocational Education and Training Authority. (2024). *TVET standards and guidelines: CBET, ODeL and digital learning content development frameworks*. Nairobi, Kenya: TVETA.

Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, *51*(1), 40-49.

The World Bank. (2019). *Improving higher education performance in Kenya: A policy report*. Author.

Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Martínez-Monés, A., & Ioannou, A. (2022). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*, *28*(6), 6695–6726. https://doi.org/10.1007/s10639-022-11431-8

Timperio, G., Kundu, T., Klumpp, M., Souza, R., Loh, X. H., & Goh, K.K. (2022). Beneficiary-centric decision support framework for enhanced resource coordination in humanitarian logistics: A case study from ASEAN. *Transportation Research Part E: Logistics and Transportation Review*, *167*, Article 102909. https://doi.org/10.1016/j.tre.2022.102909

Van Der Vlies, R. (2020). Digital strategies in education across OECD countries. *OECD Education Working Papers*. https://doi.org/10.1787/33dd4c26-en

Viberg, O., Khalil, M., & Baars, M. (2020). Self-regulated learning and learning analytics in online learning environments: A review of empirical research. *ACM International Conference Proceeding Series*, 524-533. https://doi.org/10.1145/3375462.3375483

Wang, Z., & Liu, J. (2021). The realization path of teaching management process reengineering in the Chinese universities. *Teacher Education and Curriculum Studies*, *6*(1), 12-18. https://doi.org/10.11648/j.tecs.20210601.13

World Economic Forum. (2023*). The global risks report 2023 (18th ed.)*.

Zeleza, P. T., & Okanda, P. M. (2021). *Enhancing the digital transformation of African universities: Covid-19 as accelerator*. Journal of Higher Education in Africa, *19*(1), 1-28. https://www.jstor.org/stable/48645900

Zhang, X., Gao, C., & Zhang, S. (2022). The niche evolution of cross-boundary innovation for Chinese SMEs in the context of digital transformation - A Case study based on dynamic capability. *Technology in Society*, *68*, Article 101870. https://doi.org/10.1016/j.techsoc.2022.101870

APPENDICES

Appendix I: Letter of Introduction

Lee Hyein
Pan Africa Christian University (PACU),
P.O Box 56875-00200
Nairobi-Kenya.

TO WHOM IT MAY CONCERN,

Dear Respondents,

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I am a student of Pan Africa Christian University (PACU) pursuing a Master of Business Administration degree. I am undertaking a study on the topic: *"Influence of digital transformation on Performance of institutions of higher learning within Nairobi County, Kenya: A Case study of Graffins College"*. Kindly, I am looking forward to your help in collecting data related to this research by replying to each question in the research questionnaire.

In this research, the confidentiality of all information collected from respondents is ensured, and all data will be used only for the purpose of this research.

Thank you for taking the time to fill out the queries.

Yours sincerely,
Lee Hyein

Appendix II: Informed Consent Form

Informed Consent Form

I, XXXXX, agree to participate or agree to the participation in the research project titled *"Influence of Digital Transformation on Performance of Institutions of higher learning within Nairobi County, Kenya: A Case study of Graffins College*, conducted by Lee Hyein.

I have received, read, and kept a copy of the information letter/plain language statement. I have had the opportunity to ask questions about this research and I have received satisfactory answers. I understand the general purposes, risks, and methods of this research.

I consent to participate in the research project and the following has been explained to me:

- the research may not be of direct benefit to me
- my participation is completely voluntary
- my right to withdraw from the study at any time without any implications to me
- the risks including any possible inconvenience, discomfort, or harm as a consequence of my participation in the research project
- the steps that have been taken to minimize any possible risks
- public liability insurance arrangements
- what I am expected and required to do
- whom I should contact for any complaints about the research or the conduct of the research
- I am able to request a copy of the research findings and reports
- security and confidentiality of my personal information.

In addition, I consent to:

- audio-visual recording of any part of or all research activities (if applicable)
- publication of results from this study on the condition that my identity will not be revealed.

Name of Participant ……

Signature of research participant ---------- ----------

Date……

I believe the participant is giving informed consent to participate in this study;

Signature of researcher….....Lee Hyein……

Date……November 2025…….....……

Appendix III: Questionnaire

This research aims to examine the influence of digital transformation on the performance of Graffins College. The information you provide will be used solely for academic purposes and handled with the utmost confidentiality. Your sincere and candid responses would be highly appreciated.

Section A- Demographic Sector

This section seeks background information to help contextualise your responses. Please indicate the option that best represents your situation.

a. Gender: 1. Male [ ] 2. Female [ ]
b. Age Group: 1. 18-24 [ ] 2. 25-34 [ ] 3. 35-40 [ ] 4. Above 40 [ ]
c. Department/School: 1. Technology [Program:] 2. English [ ]
d. Position: 1. Student [ ] 2. Faculty [ ] 3. Administrative Staff [ ]
e. Course Level: 1. Diploma [ ] 2. Craft (Certificate) [ ] 3. Artisan [ ] 4. Others [ ]
f. Duration at the College: 1. Below 3 months [ ] 2. 3-6 months [ ] 3. 6 months-1 year [ ] 4. 1-2 years [ ] 5. Above 2 years [ ]

Section B - Digital Transformation and Performance of Graffins College

Section B is composed of five sub-sections (I, II, III, IV, V) using a 5-point Likert scale as follows: 1: Strongly Disagree, 2: Disagree, 3: Uncertain, 4: Agree, 5: Strongly Agree. Kindly, respondents are required to indicate their level of agreement with each item by selecting one option for every statement. Please reply to the questions by ticking the box.

I. Technology-based learning and Performance of Graffins College

In this context, Technology-based learning refers to a style of instructional engagement that can enhance the performance of institutions through online, mobile, and blended learning.

Question	1	2	3	4	5
1. The college delivers high-quality online learning experiences.					
2. Blended learning is effectively integrated into the academic curriculum.					
3. Mobile learning platforms are accessible and user-friendly.					
4. I can access digital learning materials anytime and anywhere.					
5. I am confident in using digital tools for academic tasks.					

6. Online assessments are conducted in an efficient and fair manner.					
7. The college provides sufficient training on e-learning platforms					
8. Technology-based learning contributes positively to overall academic performance.					

II. Partnership, Collaboration, and Performance of Graffins College

In this context, partnership and collaboration refer to facilitating shared use of technical infrastructure and expertise, improving collective intelligence, and enabling global connectivity in education.

Question	**1**	**2**	**3**	**4**	**5**
1. The college establishes formal partnerships and collaborations to facilitate the adoption of digital innovation.					
2. I have had opportunities to participate in webinars to understand digital transformation.					
3. Partnerships with international institutions enhance digital literacy.					
4. I have experienced cross-cultural communication related to digital transformation.					
5. The college implements digital security capacity-building programs in partnership with industries.					
6. Collaborative learning contributes to enhancing inclusion in digital transformation.					
7. Strategic partnerships support the effective use of automated administrative systems.					

[1] Google- Education training for digital skills and Google Workspace, Microsoft- Technology Associate (MTA), and Azure cloud training

[2] Limkokwing University in Malaysia

[3] Cisco- Cisco Networking Academy courses covering networking, Cybersecurity, and IoT fundamentals, CompTIA- IT certification programs (A+, Network+, Security+)

III. Innovation, Creativity, and Performance of Graffins College

In this context, innovation and creativity refer to the agile use of digital technologies in terms of AI, cloud services, and online security in order to improve educational delivery, administrative systems, and governance.

Question	1	2	3	4	5
1. The college encourages the innovative use of AI, IoT, and Big Data in teaching and learning.					
2. The college is equipped with offline-friendly digital technologies.					
3. The college is organised with the integration of generative AI tools to improve the quality of teaching/learning.					
4. The curriculum aligns with the latest digital transformation strategies from the National Digital Policies[1].					
5. The college has adopted the latest digital initiatives to enhance inclusion and equity.					
6. The college conveys digital literacy development programs updated by innovative digital transformation strategies.					
7. The E-portal has been updated according to the up-to-date digital initiatives.					
8. The college invests in modern and agile digital infrastructure[3].					

[1] National Digital Policies: *National Digital Economy Blueprint & Kenya National Digital Master Plan 2022-2032*, *National Digital Literacy Curriculum* in *Connected Africa Summit 2025*, *Forum& Awards 2025* emphasizing Data-driven decision-making and automate learner tracking through the *Kenya Education Management Information System (KEMIS) and TVET MIS*

[2] Presidential Digital Talent Program (PDTP), Digital Literacy Programme (DLP)

[3] Cloud platforms, High-speed internet, E-portal, and ICT labs

IV. Research and development and Performance of Graffins College

In this context, research and development refer to promoting talent growth, knowledge sharing, and academic collaboration through robust digital ecosystems and infrastructures.

Question	1	2	3	4	5
1. The college provides robust AI services[1] to support performance improvement.					

2. The curriculum, leveraging an updated digital transformation strategy, improves learning outcomes.					
3. The college has updated digital education services in accordance with the National Digital Policy 2025[2].					
4. I'm satisfied with the education service aligned with Next-Generation Connectivity.					
5. I have received training on the ethical use of digital transformation[3].					
6. The college supports e-assessment[4] in accordance with the latest standards.					
7. The college provides capacity-building programs to train the community in using its online learning services[5].					

[1] Learning management systems (LMS), E-platforms, AI tutors and chatbots, Automated assessment tools, and Language analytics for personalised learning

[2] *Kenya Artificial Intelligence Strategy 2025-2030,* emphasizing Data Ecosystem establishment, Local AI model development, and Inclusion advancement

[3] Striking a Balance: *Kenya's AI Strategy 2025–2030* emphasizing AI ethics and Intellectual property (IP), *Global Education forum in Nairobi* emphasizing Conflict, Digital disruption, Inequality, Inclusion

[4] iBT TOEFL, Online quizzes, Online CATs, and Online final examinations

[5] LMS, Online assessments, Virtual classrooms, E-libraries, and Interactive tutorials

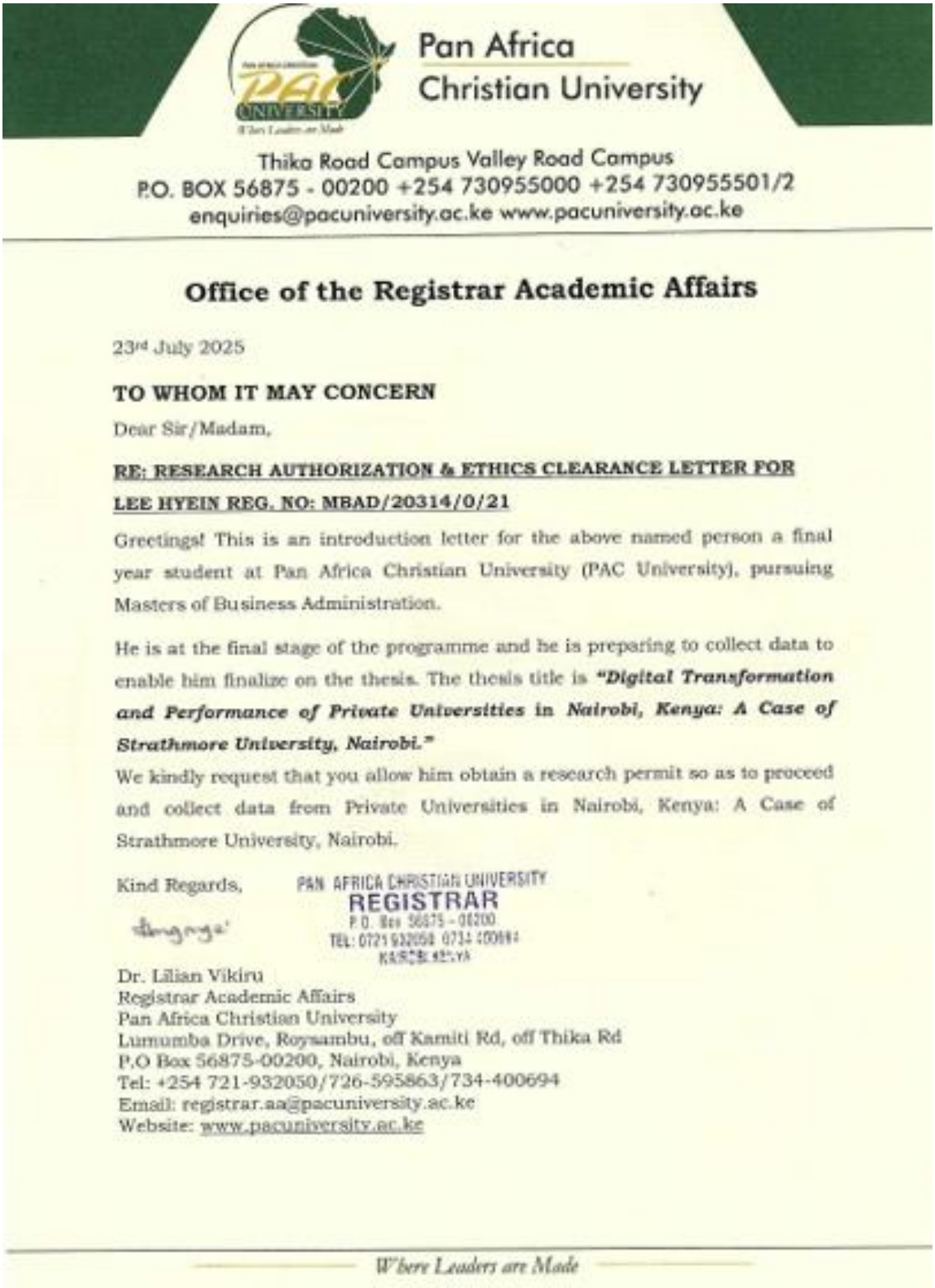
V. The Performance of Graffins College

Question	**1**	**2**	**3**	**4**	**5**
1. Graffins College delivers high-quality academic programs aligned with student needs.					
2. The college provides students with webinars for ethical leadership.					
3. Administrative services at the college are efficient and responsive.					
4. Mutual culture is well-established within the college.					
5. Graduates from the college are well-organised for employment and further study.					

6. The college has a strong and growing reputation.					
7. I have been well-trained through the academic capacity building offered by the college.					
8. The college is organised with an excellent learning environment.					

Your participation is greatly appreciated.

Appendix IV: Research Authorisation



Pan Africa Christian University

Thika Road Campus Valley Road Campus
P.O. BOX 56875 - 00200 +254 730955000 +254 730955501/2
enquiries@pacuniversity.ac.ke www.pacuniversity.ac.ke

Office of the Registrar Academic Affairs

23rd July 2025

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION & ETHICS CLEARANCE LETTER FOR LEE HYEIN REG. NO: MBAD/20314/0/21

Greetings! This is an introduction letter for the above named person a final year student at Pan Africa Christian University (PAC University), pursuing Masters of Business Administration.

He is at the final stage of the programme and he is preparing to collect data to enable him finalize on the thesis. The thesis title is ***"Digital Transformation and Performance of Private Universities in Nairobi, Kenya: A Case of Strathmore University, Nairobi."***

We kindly request that you allow him obtain a research permit so as to proceed and collect data from Private Universities in Nairobi, Kenya: A Case of Strathmore University, Nairobi.

Kind Regards,

PAN AFRICA CHRISTIAN UNIVERSITY
REGISTRAR
P.O. Box 56875 - 00200
TEL: 0721 932050 0734 400694
NAIROBI-KENYA

Dr. Lilian Vikiru
Registrar Academic Affairs
Pan Africa Christian University
Lumumba Drive, Roysambu, off Kamiti Rd, off Thika Rd
P.O Box 56875-00200, Nairobi, Kenya
Tel: +254 721-932050/726-595863/734-400694
Email: registrar.aa@pacuniversity.ac.ke
Website: www.pacuniversity.ac.ke

Where Leaders are Made

Notice: The research title appearing in the university research authorisation letter refers to the study whose currently approved title is: "INFLUENCE OF DIGITAL TRANSFORMATION ON PERFORMANCE OF INSTITUTIONS OF HIGHER LEARNING WITHIN NAIROBI COUNTY, KENYA: A CASE STUDY OF GRAFFINS COLLEGE". This study is consistent with the NACOSTI permit and the thesis cover page.

Appendix V: Certificate of Ethical Clearance



Pan Africa Christian University

Thika Road Campus | Valley Road Campus
P.O. Box 56875-00200 | +254 730955000 | +254 730955501/2
enquiries@pacuniversity.ac.ke | www.pacuniversity.ac.ke

REF: PAC/ISERC/95/07/25 Date: 15/07/2025
TO: Lee, Hyein (MBAD/20314/0/21)

PAC UNIVERSITY

Dear Madam,
RE: DIGITAL TRANSFORMATION AND PERFORMANCE OF PRIVATE UNIVERSITIES IN NAIROBI, KENYA: A CASE OF STRATHMORE UNIVERSITY, NAIROBI

This is to inform you that PAC_ *ISERC* has reviewed and approved your above research proposal. Your application approval number is PAC/ISERC/95/07/25. The approval period is 15th July 2025 – 15th July 2026.

This approval is subject to compliance with the following requirements;

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

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

Yours sincerely,

Dr. Jane Kinuthia

Chair, ISERC

Where Leaders are Made

Notice: The research title appearing in the ethical clearance refers to the study whose currently approved title is: "INFLUENCE OF DIGITAL TRANSFORMATION ON PERFORMANCE OF INSTITUTIONS OF HIGHER LEARNING WITHIN NAIROBI COUNTY, KENYA: A CASE STUDY OF GRAFFINS COLLEGE". This study is consistent with the NACOSTI permit and the thesis cover page.

Appendix VI: NACOSTI Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **474359**

Date of Issue: **12/November/2025**

RESEARCH LICENSE



This is to Certify that Ms.. Hyein Lee of Pan Africa Christian University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: INFLUENCE OF DIGITAL TRANSFORMATION ON PERFORMANCE OF INSTITUTIONS OF HIGHER LEARNING WITHIN NAIROBI COUNTY, KENYA: A CASE STUDY OF GRAFFINS COLLEGE for the period ending : 12/November/2026.

License No: **NACOSTI/P/25/4179717**

474359

Applicant Identification Number

Ag. Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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

See overleaf for conditions

Appendix VII: Work plan

Task	2025 June	Wk 3-4	July	Aug	Sep	Oct	Nov	Dec - 2026 April	2026 May - June
Proposal Defense & Submission of revised proposal	☐								
Research Permit& Ethics review		☐							
Preparation for Survey at Graffins College			☐	☐					
NACOSTI research permit and Instrument pretesting					☐	☐			
Data Collection and analysis							☐		
Report writing							☐	☐	
Submission of thesis with editing and final defense								☐	
Final thesis submission after correction and graduation preparation									☐

Appendix VIII: Budget

Item	Description	Estimated Cost (Kshs)
Equipment	Tools or devices needed for research (SPSS, etc.)	13,000
Materials	Research materials (books, journals, etc.)	3,000
Stationery	Pens, Printing paper (A4), etc.	5,000
Transport	Uber fee for field work	15,000
Subsistence	Meals and snacks for break	5,000
Cost of Documents required (NACOSTI, Ethics Clearance)	Payment for document, photograph fee	USD 350 (NACOSTI) + 1,500 (Ethics Clearance)+1,000 (Photograph)
Cost of Production of final Documents	Printing, Binding, and Photocopying	30,000
Total Cost		USD 350+73,500