Bridging the Digital Divide in Kenyan Public Universities: An Appraisal of ICT and Artificial Intelligence Readiness for Fostering Inclusive Pedagogy and Sustainable Development in Education.

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ABSTRACT

The study focused on Bridging the Digital Divide in Kenyan Public Universities: An Appraisal of ICT and Artificial Intelligence Readiness for Fostering Inclusive Pedagogy and Sustainable Development in Education. This study examined ICT and AI readiness across 10 selected public universities in Kenya, focusing on infrastructure quality, faculty competencies, institutional support, and the relationship between preparedness and teaching effectiveness. Anchored in the Technology Acceptance Model (Davis, 1989) and Diffusion of Innovations theory (Rogers, 1962; 2003), the study adopted a descriptive survey and correlational design. The respondents of the study included; faculty members and administrators. Data were collected from 480 respondents (360 faculty and 120 administrators) using questionnaires and interviews, with both quantitative and qualitative analyses employed. Findings reveal that while faculty demonstrate moderate digital literacy competencies, advanced skills such as digital content creation and AI integration remain limited. Institutional support, including policies, infrastructure, and professional development opportunities, was rated as moderate. Importantly, results show a significant positive correlation ($r = .452$, $p < .001$) between faculty preparedness and teaching effectiveness, emphasizing on the centrality of human capacity development in digital adoption. The study concludes that while ICT infrastructure in Kenyan universities has moderately advanced, AI preparedness lags, threatening inclusive and equitable digital transformation. It recommends sustained investment in ICT infrastructure, structured AI-focused training, continuous professional development, and robust institutional policies to strengthen digital ecosystems in higher education.

Key Words: Digital Divide, ICT Infrastructure, Artificial Intelligence in Education, Inclusive Pedagogy, Kenyan Public Universities.

INTRODUCTION

Even in highly developed countries, digital divides persist, showing that technological advancement does not automatically translate to universal digital equity. In the United States, internet access has risen to nearly 97% by 2024, yet affordability and broadband reliability remain elusive for over 14 million people, particularly in rural and low-income households (Access Partnership, 2025; Pew Research Center, 2021). Similarly, in the United Kingdom, government initiatives have increased broadband penetration, but gaps in digital literacy continue to limit inclusive digital engagement for marginalized communities (OECD, 2025; Ofcom, 2023). These experiences underscore the importance of addressing both infrastructure and user capacity.

Across Organization for Economic Co-operation and Development (OECD) nations, significant progress has been made in improving connectivity, but inequalities remain evident in quality of access. For example, median fixed broadband speeds surged from 53 Mbps in 2019 to 178 Mbps by 2024; however, the urban–rural gap widened from 22 Mbps to 58 Mbps in the same period (OECD, 2025). Similarly, although mobile broadband coverage expanded substantially, urban users enjoy up to 45 Mbps faster speeds than rural users, reflecting persistent inequality in digital inclusion (OECD, 2025; ITU, 2022). This demonstrates that bridging divides requires not only access but equitable quality of service.

Canada faces similar rural-urban inequalities due to its vast geography. Despite declaring broadband a universal service in 2019, nearly one million Canadians particularly Indigenous and northern communities still lack reliable high-speed connections (Canadian Radio-television and Telecommunications Commission [CRTC], 2022; Ahmmed et al., 2022). To address this, Canada has invested in Low Earth Orbit (LEO) satellite solutions and federal broadband funds, highlighting that technological innovations must be paired with inclusive policies to ensure equitable access.

China, on the other hand, has become a global leader in AI and ICT integration in education. Its "Next Generation AI Development Plan" launched in 2017 has resulted in more than one hundred universities offering AI majors and mandatory digital literacy courses by 2025 (Yan et al., 2025; Fan et al., 2025). AI-powered adaptive platforms in China have improved student learning efficiency by up to 50%, and engineering students report gains in creativity and independent thinking, although concerns over content accuracy persist (Fan et al., 2025; AI Reports Africa, 2025). This model illustrates how deliberate national strategies can rapidly transform higher education systems.

These institutional shifts in China reflect a broader emphasis on aligning AI education with workforce readiness. Students report that institutional support drives adoption of generative AI tools, valuing their efficiency and usability but raising ethical concerns regarding reliability and academic integrity (Yan et al., 2025; Fan et al., 2025). The Chinese experience shows that while AI can democratize access to personalized learning, governance and ethical safeguards are vital for sustainability.

South Africa's experience presents a contrast in the Global South. Prior to the COVID-19 pandemic, only 22% of South Africans had reliable internet access, and even after investments, rural schools continue to face overcrowding, limited devices, and inadequate teacher training in digital skills (UNESCO, 2022; Department of Higher Education and Training, 2023). Nigeria has begun piloting AI-enhanced learning platforms such as Inspire and Ignite, showing potential to improve personalized learning despite infrastructural gaps (UNICEF, 2023; The World Bank, 2024). These cases reveal both the opportunities and systemic challenges of embedding ICT in education across Africa.

Rwanda offers a success story in regional digital innovation. Its government treats ICT as a public utility, rolling out more than 7,000 km of fibre-optic cable and achieving high LTE coverage by 2023 (NTU Singapore, 2025; Ministry of ICT Rwanda, 2023). The country has also promoted technology start-ups such as Zipline, positioning itself as a knowledge hub in East Africa. Similarly, Tanzania and Uganda participate in continental programs like the NEPAD E-School initiative, though evaluations reveal that without sustained teacher training and funding, long-term impacts remain limited (NEPAD, 2024; UNESCO, 2023). These regional variations show that national commitment and investment are decisive factors in bridging digital divides.

Kenya demonstrates both progress and persistent inequities. The government's Digital Literacy Program has increased digital infrastructure in schools, but marginalized students and learners with disabilities remain underserved (Owidi, 2025; UNESCO, 2022). Public universities in Kenya face challenges such as patchy connectivity, frequent power interruptions, and insufficient faculty ICT capacity, hindering equitable adoption of AI and ICT for pedagogy (Knowledge Warehouse Kenya, 2021; World Bank, 2024). These limitations emphaize the importance of inclusive policies that move beyond infrastructure to address human capacity.

In 2025, the Open University of Kenya launched the China–Africa Digital Learning Center, linked to Konza Technopolis and the National Data Centre, developed with Chinese concessional loans (Konza Technopolis, 2025; Xinhua News Agency, 2025). Such initiatives enhance Kenya's capacity for digital education and AI innovation, though they must be scaled across all public universities to avoid deepening inequalities. Institutions like Mount Kenya University have already adopted AI-driven platforms for administrative and academic support, signaling that localized innovation is possible (MKU, 2025; Daily Nation, 2025).

These global and regional experiences emphasize that bridging digital divides in higher education requires a holistic strategy one that integrates infrastructure, policy, affordability, digital literacy, and ethical governance. For Kenya's public universities, the challenge is not only to expand access but to ensure that ICT and AI adoption fosters inclusive pedagogy and contributes to sustainable development (Owidi, 2025; UNESCO, 2023). Drawing

from global best practices and regional lessons, Kenya stands at a critical juncture to lead in building equitable digital futures for higher education.

Statement of the Problem

Universities today should operate as inclusive digital ecosystems that harness ICT and AI to elevate teaching, learning, and administration. In such an environment, all students would have fair access to robust infrastructure, digital tools, and adaptive AI platforms paired with educators who are equipped with the necessary digital literacy. This integration supports personalized learning, inclusivity, and alignment with the UN Sustainable Development Goals, emphasizing education as a catalyst for equitable knowledge economies.

In Kenyan public universities, this ideal remains elusive. While efforts like the Digital Literacy Program have advanced device access, significant disparities persist, particularly in rural and marginalized settings. Owino and Otieno (2021) documented how inadequate infrastructure, unreliable electricity, and poor maintenance curb program effectiveness in these areas, while Owidi et al. (2023) found that only limited integration of AI and online learning tools has occurred, hindered by minimal faculty competence and weak institutional support

To close this gap, the present study examines ICT and AI readiness across Kenyan public universities focusing on infrastructure quality, faculty digital capacities, institutional frameworks, and inclusivity of digital initiatives. By triangulating empirical data and policy review, the research aims to identify both enablers and obstacles to digital transformation. These insights will inform targeted strategies that universities, policymakers and stakeholders can implement to strengthen inclusive pedagogy and contribute to sustainable development outcomes.

Research Questions

1. What is the current state of ICT infrastructure including internet connectivity, digital devices and software resources in Kenyan public universities?

2. To what extent are faculty members and administrators in Kenyan public universities prepared to integrate digital literacy and artificial intelligence into teaching and learning?

3. Is there a significant relationship between the preparedness of faculty members and administrators to integrate digital literacy and artificial intelligence and the effectiveness of teaching and learning practices in Kenyan public universities?

Significance of the Study

This study will benefit faculty and administrators in Kenyan public universities by providing a clear understanding of their readiness to integrate digital literacy and artificial intelligence (AI) into teaching and management. It will identify gaps in training, infrastructure, and institutional support, thereby offering actionable insights that can enhance teaching practices and decision-making for effective digital transformation.

Students stand to gain the most as improved ICT and AI integration will create inclusive, engaging, and equitable learning environments. By addressing disparities in digital access and pedagogy, the findings will ensure that learners receive quality education that prepares them with the digital skills needed for the 21st-century workforce.

The Ministry of Education and other policy-making bodies will benefit from the evidence generated by this study to inform investment in digital infrastructure, professional development programs, and the alignment of higher education with Kenya's digital economy agenda. This will strengthen policies that drive innovation and sustainable development in the education sector.

Theoretical Framework

The Technology Acceptance Model (TAM) developed by Fred Davis (1989) provides valuable insights into individual readiness for ICT and Artificial Intelligence adoption. TAM posits that technology acceptance is largely influenced by users' perceptions of usefulness and ease of use, which in turn shape their attitudes, intentions and actual utilization of innovations. In the context of Kenyan public universities, this theory is relevant in explaining how lecturers, students, and administrators perceive ICT tools and AI applications. Their willingness to integrate digital innovations into teaching, learning, and administration depends on whether they view these technologies as beneficial to performance and free from excessive complexity. Thus, TAM helps capture the psychological and behavioral dimensions of readiness that determine the success of digital transformation in higher education.

Complementing this is Rogers' Diffusion of Innovations (DOI) theory (1962; 2003), which explains how new technologies are adopted and spread across institutions and social systems. The theory highlights adoption categories innovators, early adopters, early majority, late majority and laggards and emphasizes the influence of relative advantage, compatibility, complexity, trialability and observability on the adoption process. Applied to the present study, DOI helps to analyze how ICT and AI innovations diffuse within and across Kenyan public universities, why some institutions advance quickly while others lag, and the systemic factors that shape adoption. Together, TAM and DOI provide a comprehensive framework for assessing ICT and AI readiness by integrating individual-level perceptions with institutional-level diffusion dynamics, which is essential for bridging the digital divide and fostering inclusive, sustainable development.

LITERATURE REVIEW

Status of ICT Infrastructure in Kenyan Public Universities

Kenyan public universities sit within a rapidly evolving national ICT policy framework that explicitly targets higher-education digitalization. The 2019 National ICT Policy and the Ministry of Education's ICT in Education and Training Policy (2021) emphasize broadband expansion, institutional capacity building, and integration of e-learning across tertiary institutions (Ministry of Education, 2021). Sectorally, the Kenya Education Network (KENET) the country's National Research and Education Network (NREN) anchors university connectivity, shared services, and community cloud resources for public institutions (KENET, 2023).

Connectivity has improved in backbones and upstream links, but campus networks remain the principal bottleneck. A KENET gap analysis identified local campus LAN/WLAN design, contention ratios, and inadequate last-mile distribution as the most critical constraints limiting experienced throughput for students and staff, despite decent upstream capacity (KENET, 2021). This analysis frames the "last-100-meters" problem as pivotal for quality of service in labs, lecture halls, hostels, and libraries (KENET, 2021; World Bank, 2022).

Kenyan universities are also integrating eduroam to standardize secure roaming access for students and researchers. Regional data show accelerating eduroam deployments across African campuses, including Kenya, to mitigate insecure workarounds and support anywhere/anytime academic access (AfricaConnect3, 2024; AfricaConnect3, 2023). This identity-federated access is increasingly viewed as a cost-effective way to extend Wi-Fi reliability and reduce credential-sharing risks on crowded campus networks.

The COVID-19 period (2020–2022) catalyzed rapid shifts from face-to-face to blended and online modalities, stress-testing university connectivity and hosting capacity. Several public universities migrated or upgraded LMS instances to KENET's community cloud for higher uptime and more elastic compute/RAM during enrollment surges, revealing both the potential and fragility of e-learning infrastructure (KENET, 2022). Studies on institutional readiness during the pandemic similarly reported uneven preparedness, with connectivity, platform reliability, and digital support services as recurring gaps (Omito, 2024).

Device access remains a structural determinant of participation. While smartphone ownership is widespread among university students, laptop ownership is uneven and cost-constrained, creating disparities in courses requiring productivity software and development tools (Owino & Rutto, 2023; UNESCO Kenya Journal, 2024).

Empirical accounts from learners describe device mandates as exclusionary for low-income students, underscoring the need for device loan schemes and campus-based thin-client labs (UNESCO Kenya Journal, 2024).

On the software side, most public universities standardize on institution-wide LMS platforms and productivity suites, but capacity and sustainability considerations drive hybrid provisioning. Case evidence shows a growing shift to Infrastructure-as-a-Service (IaaS) for LMS and exam systems to handle peak loads and reduce downtime, as documented in a recent Kenyan university case (Yegon et al., 2025), while faculty surveys highlight bandwidth and reliable LMS availability as core success factors for e-learning.

Regulatory guidance has nudged infrastructure minimums. The Commission for University Education (CUE) has issued standards and guidelines that interface with ODeL quality assurance, prompting institutions to codify bandwidth, uptime, and data security baselines for digital delivery (Republic of Kenya, 2021). This policy alignment has supported more systematic investments in network upgrades, data centers, and authentication/authorization infrastructure.

Nevertheless, structural inequalities persist. Analyses of digital public services in Kenya—relevant to university communities that rely on the same ecosystem stress rural/low-income connectivity gaps and affordability barriers that echo in students' off-campus access, especially during remote study (CIPIT, 2025). Broader reviews of ICT in education in East Africa also point to policy-implementation gaps and chronic under-investment in technical support, maintenance, and refresh cycles (Aga Khan University, 2022).

Because smartphones outnumber computers, many universities supplement LMS access with mobile-first channels (e.g., SMS alerts, USSD gateways) to widen reach where data or devices are limited. This "mobile-first but not mobile-only" posture balances equity with pedagogical needs that still require laptops/desktops for labs, programming and data analysis (Wiley BJET, 2024; Owino & Rutto, 2023).

Faculty and Administrators' Preparedness to Integrate Digital Literacy and Artificial Intelligence into Teaching and Learning

Faculty and administrators are central actors in embedding digital literacy and artificial intelligence (AI) into higher education teaching and learning. Preparedness entails both technical competence and pedagogical adaptability to integrate emerging tools effectively. Globally, institutions increasingly recognize that digital literacy is no longer optional but a prerequisite for 21st-century teaching and management (Ng, 2021). Preparedness therefore involves not only basic ICT skills but also the ability to critically engage with digital platforms, manage online pedagogies, and align curricula with digital transformation goals.

Research in African universities shows uneven preparedness among faculty. While many academics report confidence with general ICT applications, significant skill gaps persist in advanced digital literacy areas such as data analytics, e-assessment tools, and digital content creation (Wachira & Mburu, 2022). These deficiencies limit effective uptake of AI-driven educational technologies like adaptive learning platforms, automated grading systems, and predictive analytics dashboards. Administrators, meanwhile, play a vital role in setting policy and ensuring supportive infrastructures, yet studies show they often lack the technical know-how to lead digital transformation initiatives effectively (Adarkwah, 2021).

Kenyan universities provide illustrative cases. Faculty preparedness for digital integration improved during COVID-19 due to rapid capacity-building workshops, but many instructors relied on emergency remote teaching strategies rather than pedagogically sound digital designs (Omito, 2024). Administrators in public universities expanded ICT infrastructure but encountered challenges in aligning institutional policies with faculty digital competencies, leading to gaps in sustainability of e-learning innovations (UNESCO, 2024). This highlights a preparedness paradox: while infrastructural investments advance, human capacity development lags.

Artificial intelligence adoption poses even more complex readiness demands. AI tools such as intelligent tutoring systems, plagiarism detection software, and predictive analytics require faculty to interpret outputs critically and integrate them ethically into teaching practice (Zawacki-Richter et al., 2019). Administrators must anticipate

governance issues such as data privacy, algorithmic bias, and academic integrity. Evidence shows limited AI-specific training for both faculty and administrators in Sub-Saharan Africa, resulting in low awareness of AI's pedagogical and managerial potentials (Kigotho & Otieno, 2023).

Preparedness is further constrained by attitudes and perceptions. Faculty openness to AI integration depends heavily on their perceived ease of use and relevance to student learning outcomes (Al-Emran & Shaalan, 2020). Administrators' willingness to allocate budgets for AI-enhanced tools is tied to institutional culture and strategic priorities. Where leaders frame AI as a catalyst for improving learning analytics and student support, faculty are more likely to embrace its integration (Holmes et al., 2021). Conversely, skepticism about AI replacing human educators or complicating workloads dampens adoption.

Professional development remains a critical pathway for strengthening preparedness. Targeted workshops and training programs have been shown to improve digital pedagogy confidence among faculty, but many remain short-term and fragmented (Wachira & Mburu, 2022). Administrators often emphasize infrastructure investment but neglect long-term continuous professional development that would institutionalize AI and digital literacy integration (Owino & Rutto, 2023). As such, scholars recommend structured professional learning communities, peer mentoring, and ongoing certification schemes to bridge gaps.

Institutional leadership also shapes preparedness. Universities with proactive administrators who create enabling policies such as incentives for digital innovation, workload adjustments, and recognition for technology-driven teaching report higher adoption of digital tools among faculty (Adarkwah, 2021). Conversely, hierarchical leadership styles that prioritize compliance over innovation often leave faculty unmotivated to experiment with AI or digital literacy initiatives (UNESCO, 2024).

Globally, there is a growing body of research indicating that readiness for digital literacy and AI must be conceptualized as an ecosystem involving faculty, administrators, ICT support staff, and policy frameworks (Zawacki-Richter et al., 2019). For instance, in Asian and European universities, AI adoption has been smoother due to strong national strategies that integrate faculty training, digital infrastructure, and data governance (Holmes et al., 2021). In Kenya, however, faculty and administrators often operate in silos, with fragmented training initiatives and insufficient cross-departmental digital strategies (Kigotho & Otieno, 2023).

Ethical and policy dimensions are also central to preparedness. Administrators must ensure faculty are aware of regulatory frameworks governing AI use in education, including student data protection and algorithmic fairness (Holmes et al., 2021). Faculty, in turn, need literacy in AI ethics to model responsible use for students. Current evidence suggests that both groups in Kenyan universities have limited exposure to AI ethics training, posing risks of uninformed adoption (Wachira & Mburu, 2022).

Faculty and administrators' preparedness to integrate digital literacy and AI into teaching and learning is evolving but marked by gaps in skills, policy, and attitudes. Faculty often demonstrate baseline ICT competence but lack advanced digital literacy and AI-specific skills. Administrators focus on infrastructure expansion but underinvest in sustained professional development. Preparedness therefore requires a holistic approach that blends infrastructure investment, continuous training, supportive leadership, and policy alignment. Without such integration, Kenyan universities risk digital divides that undermine AI's transformative potential in higher education.

METHODOLOGY

Research Design

This study will adopt a descriptive survey and correlational research design. The descriptive design is appropriate because it enables the researcher to gather information from a large group of respondents regarding their preparedness, attitudes, and practices in integrating digital literacy and artificial intelligence (AI) into teaching and learning. Descriptive surveys are effective in obtaining both quantitative and qualitative data about prevailing conditions, opinions, and experiences (Creswell & Creswell, 2018). In using this design, the study captures faculty and administrators' perceptions, skill levels, infrastructural support, and institutional readiness

without manipulating variables. The study will also explore the relationship between the preparedness of faculty members and administrators to integrate digital literacy and artificial intelligence, and the effectiveness of teaching and learning practices

Target Population

The study will target faculty members and administrators in public universities in Kenya. Faculty members include lecturers, senior lecturers, and professors engaged in teaching and learning, while administrators include deans, directors of ICT, registrars (academic), and quality assurance officers. The population is appropriate because both groups are directly involved in designing, implementing, and supporting digital and AI-enhanced learning environments. According to the Kenya National Qualifications Authority (KNQA,2024), there are 31 accredited public universities in Kenya, with an estimated faculty population of 11,000 and administrators of approximately 1,500.

Sampling Procedure and Sample Size

The study will use a multistage sampling approach. First, public universities will be stratified into categories based on their geographical regions (Nairobi, Rift Valley, Western, Coast, and Central). From each region, two universities will be purposively selected to ensure representativeness of both older established universities and newly chartered institutions.

Within each university, stratified random sampling will be used to categorize respondents into faculty and administrators. From each selected university, at least **30 faculty members** and **10 administrators** will be sampled. This will yield a total sample size of approximately **480 respondents** (360 faculty and 120 administrators). The sample size determination aligns with Krejcie and Morgan's (1970) formula for ensuring representativeness.

Research Instruments

The study will employ structured questionnaires and interview schedules as the main research instruments. Questionnaires will be administered to faculty members, comprising closed-ended Likert-scale items to assess levels of preparedness, digital literacy and AI competencies, alongside open-ended questions to capture qualitative insights. Interview schedules will then be conducted with administrators to obtain deeper perspectives on institutional policies, infrastructural readiness, and strategic integration of AI into teaching and learning. The instruments will be organized around five key themes: digital literacy competencies (technical, informational, and pedagogical), AI awareness and readiness, institutional support and leadership, professional development opportunities and attitudes and perceptions toward digital and AI integration.

Validity and Reliability of Instruments

Content validity will be ensured through expert review. Draft instruments will be submitted to specialists in educational technology and research methodology to assess clarity, relevance and comprehensiveness.

Reliability will be tested through a pilot study involving 30 respondents (faculty and administrators) from one university not included in the main study. Cronbach's alpha coefficient will be calculated to assess internal consistency of the Likert-scale items. A reliability coefficient of 0.7 and above will be considered acceptable (Tavakol & Dennick, 2011).

Data Collection Procedure

Data collection will involve seeking approval from the National Commission for Science, Technology and Innovation (NACOSTI), relevant university authorities, and ethics committees before commencement. Questionnaires will then be administered to faculty through both physical distribution and online platforms such as Google Forms to maximize accessibility and participation. In addition, interviews will be conducted both face-to-face and virtually via Zoom or Google Meet with selected administrators to obtain deeper insights.

Respondents will be provided sufficient time to complete the questionnaires, and follow-up reminders will be issued to improve response rates and ensure adequate data return.

Data Analysis

Quantitative data from questionnaires will be coded and analyzed using Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics such as frequencies, percentages, means and standard deviations will summarize respondents' preparedness levels. Inferential statistics such as regression analysis will be used.

Qualitative data from open-ended questionnaire items and interviews will be analyzed thematically. Responses will be transcribed, coded, and categorized into themes.Findings will then be triangulated with quantitative results to enhance validity.

Ethical Considerations

The study will adhere to ethical guidelines in educational research. Respondents will be informed about the study's purpose, and informed consent will be obtained before data collection. Anonymity and confidentiality will be guaranteed by ensuring that responses are not linked to personal identifiers. Participation will be voluntary and respondents will have the right to withdraw at any stage without penalty. Data will be securely stored and used strictly for academic purposes.

DATA ANALYSIS, PRESENTATION, AND INTERPRETATION

Introduction

This chapter presents the results of the study in line with the research objectives and questions outlined earlier. The purpose of this chapter is to analyze the data collected from faculty members through questionnaires and from administrators through interviews and to interpret the findings with support from existing literature. The results are presented in both quantitative and qualitative form. Quantitative data were analyzed using descriptive statistics frequencies, means and standard deviations and are summarized in tables following APA format. Qualitative data were obtained through interviews with administrators and analyzed thematically. These narratives are integrated within the discussion of each thematic area to corroborate or contrast the quantitative results, thereby enriching the findings and providing a holistic picture.

Demographic Information of Respondents

The study collected background information on respondents, including gender, age, academic rank, years of teaching experience and faculty/school of affiliation. These characteristics help to contextualize the findings that follow.

Gender of Respondents

Table 4.1 Gender of Respondents

Gender	**N**	**%**
Male	210	58.3
Female	150	41.7
Total	**360**	**100**

The results indicated that 210 respondents (58.3%) were male, while 150 (41.7%) were female. This distribution reflects a continuing gender imbalance in academic staffing within Kenyan universities, where male faculty tend to dominate, particularly at senior levels. Recent studies highlight that this gender gap is not only structural but also intersects with disparities in access to technology, digital confidence and participation in professional

development (Mutula, 2023; UNESCO, 2019). Women in higher education are often underrepresented in science, technology and leadership roles, which may affect their exposure to digital tools and opportunities for innovation (Salajan, Schönwetter, & Cleghorn, 2015). The inclusion of both male and female perspectives in this study provides a more comprehensive understanding of the faculty profile in public universities.

Age of Respondents

Table 4.2 Age of Respondents

Age Group	**N**	**%**
Below 30	20	5.6
31–40 years	87	24.2
41–50 years	130	36.1
Above 50	123	34.2
Total	**360**	**100**

The age distribution showed that the largest group of respondents were aged 41–50 years (130; 36.1%), closely followed by those above 50 years (123; 34.2%). Respondents aged 31–40 years accounted for 87 (24.2%), while only 20 (5.6%) were below 30 years. This indicates that the sample was dominated by mature and senior faculty, with relatively fewer young academics represented. This pattern reflects the staffing profile in many Kenyan public universities, where hiring freezes and limited recruitment of early-career staff have resulted in an aging academic workforce (CHE, 2016). While mid-career and older faculty bring valuable experience and institutional memory, studies caution that younger academics are often more adaptive to new technologies and innovative pedagogies (Mtebe & Raisamo, 2014). The relatively low representation of those below 30 years may suggest gaps in succession planning and the infusion of digital-native perspectives into teaching and learning. Nevertheless, the strong representation of senior faculty ensures that the perspectives captured reflect deep institutional engagement with teaching, research and administration.

Academic Rank of Respondents

Table 4.3 Academic Rank of Respondents

Rank	**N**	**%**
Tutorial Fellow	60	16.7
Assistant Lecturer	105	29.2
Lecturer	120	33.3
Senior Lecturer	51	14.2
Associate Professor	15	4.2
Professor	9	2.5
Total	**360**	**100**

Lecturers (120; 33.3%) and Assistant Lecturers (105; 29.2%) constituted the majority of respondents, followed by Tutorial Fellows (60; 16.7%). Senior Lecturers accounted for 51 respondents (14.2%), while Associate

Professors (15; 4.2%) and Professors (9; 2.5%) were least represented. This distribution illustrates the pyramidal staffing structure common in many African universities, where junior and mid-level academic ranks dominate numerically while senior faculty are fewer (CHE, 2016). Studies in higher education have shown that academic rank often corresponds to differences in access to institutional resources, participation in policy formulation, and opportunities for professional development (Odera, 2011; Almekhlafy, 2024). The dominance of lower academic ranks highlights the significant role of early- and mid-career academics in shaping teaching and learning practices within universities.4.2.3 Academic Rank of Respondents

Teaching Experience of Respondents

Table 4.4 Teaching Experience of Respondents

Years of Experience	**N**	**%**
1–5 years	40	11.1
6–10 years	70	19.4
11–15 years	110	30.6
16 years and above	140	38.9
Total	**360**	**100**

The results revealed that the largest group of respondents had 16 years and above of teaching experience (140; 38.9%), followed by those with 11–15 years (110; 30.6%). Faculty with 6–10 years of experience accounted for 70 (19.4%), while only 40 (11.1%) had less than five years of teaching experience. This distribution confirms the dominance of senior and long-serving faculty in Kenyan public universities, consistent with the age profile observed. The strong presence of highly experienced academics suggests that the universities benefit from institutional memory, established scholarly networks, and stability in teaching and administration. However, the relatively small proportion of early-career faculty (30.5% combined in 1–10 years) raises concerns about succession planning and the infusion of innovative teaching practices often associated with younger staff.

Studies have shown that experienced academics tend to be more grounded in traditional pedagogies, whereas early-career faculty are typically more responsive to technological change and innovative practices (Tondeur et al., 2017). The present distribution implies that unless deliberate recruitment of younger faculty occurs, the pace of digital transformation may face structural constraints linked to the age and experience composition of the workforce.

Faculty/School of Respondents

Table 4.5 Faculty of Respondents

Faculty/School	**N**	**%**
Education	85	23.6
Humanities and Social Sci.	82	22.8
Science and Technology	78	21.7
Business and Economics	65	18.0
Other (e.g., Agriculture, Health, Law)	50	13.9
Total	**360**	**100**

Respondents were drawn from a wide range of faculties, with Education (85; 23.6%) and Humanities and Social Sciences (82; 22.8%) being the most represented. Faculties of Science and Technology (78; 21.7%) and Business and Economics (65; 18.0%) also contributed significantly, while other faculties including Agriculture, Health, and Law accounted for 50 respondents (13.9%). Such a distribution demonstrates that the study encompassed perspectives from across the disciplinary spectrum. Previous studies note that disciplinary cultures strongly shape the use of ICT in higher education: while faculties in science and technology are often better resourced and exposed to advanced digital tools, those in humanities and education tend to integrate ICT more creatively for pedagogy and student engagement (Salajan et al., 2015; Hapakenya, 2024). The representation across faculties therefore ensures that diverse academic traditions and practices are reflected in the study.

Digital Literacy Competencies

This section presents findings on faculty members' digital literacy competencies in Kenyan public universities. Responses were drawn from five items that assessed the ability to use basic tools, manage Learning Management Systems (LMS), create and integrate digital content, encourage student collaboration through digital platforms and solve basic technical problems.

Table 4.6: Digital Literacy Competencies

Descriptive Statistics			
	N	**Mean**	**Std. Deviation**
I am competent in using basic digital tools (e.g., word processors).	360	3.42	0.68
I can effectively use Learning Management Systems (LMS).	360	3.18	0.81
I create and integrate digital content (e.g., videos, simulations).	360	2.76	0.92
I encourage students to use digital platforms for collaboration.	360	3.21	0.77
I am confident in solving basic technical problems.	360	2.89	0.84
Overall Mean	360	**3.09**	**0.80**

Faculty members generally agreed that they were competent in using basic digital tools such as word processors, spreadsheets and presentation software (M = 3.42, SD = 0.68). This indicates that foundational ICT skills are well established among faculty. Respondents also agreed that they encouraged students to use digital platforms for collaboration (M = 3.21, SD = 0.77) and could effectively use Learning Management Systems (M = 3.18, SD = 0.81).

However, relatively lower mean scores were observed in creating and integrating digital content (M = 2.76, SD = 0.92) and in solving basic technical problems (M = 2.89, SD = 0.84). These results suggest that while faculty members are confident in everyday ICT use, they face challenges in more advanced digital literacy tasks that require creativity or troubleshooting skills. The overall mean score of 3.09 (SD = 0.80) indicates moderate agreement that faculty members are digitally competent, though there are clear gaps in advanced skills.

Interview data provided further depth to these findings. Several administrators noted that while most faculty can handle basic ICT functions, very few are comfortable with advanced applications. One ICT director remarked:

"*Many lecturers can upload notes or assignments to the LMS, but only a handful know how to design interactive content or troubleshoot issues without calling support staff*.".

Similarly, a dean from a coastal university observed:

"*Younger faculty are more adept at using digital tools, but older staff often struggle, especially with integrating videos or simulations in teaching.*"

These narratives corroborate the quantitative data showing competence in routine digital tools but gaps in advanced applications and technical troubleshooting. The findings align with earlier research indicating that African faculty generally demonstrate competence in basic ICT use but lack proficiency in advanced digital pedagogy. Wachira and Mburu (2022) similarly reported that while most academics were comfortable with standard software and LMS navigation, far fewer engaged in creating digital content or using e-assessment tools. Globally, Ng (2021) underscores that effective digital literacy extends beyond basic ICT skills to include content creation and problem-solving areas that remain underdeveloped in this study. Taken together, the evidence suggests that while Kenyan public university faculty have a strong foundation in basic digital literacy, investment in capacity building for advanced competencies is essential if digital technologies are to be fully leveraged in teaching and learning.

AI Awareness and Readiness

This section presents findings on faculty members' awareness and readiness to integrate Artificial Intelligence (AI) in teaching and learning. Five items were measured, including awareness of AI applications, preparedness to use AI tools, training received, beliefs about AI's potential for personalized learning, and openness to AI-driven assessments.

Table 4.7: AI Awareness and Readiness

Descriptive Statistics			
	N	Mean	Std. Deviation
I am aware of AI applications (e.g., plagiarism detection, tutoring).	360	3.35	0.72
I feel adequately prepared to integrate AI tools in teaching.	360	2.61	0.89
I have received orientation or training on AI use in education.	360	2.33	0.95
I believe AI can improve personalized learning and engagement.	360	3.28	0.76
I am open to adopting AI-driven assessment and feedback systems.	360	3.10	0.83
Overall Mean	**360**	**2.93**	**0.83**

Results indicate that most respondents were aware of AI applications in higher education (M = 3.35, SD = 0.72), and many believed AI could improve personalized learning and student engagement (M = 3.28, SD = 0.76). Faculty also expressed openness toward adopting AI-driven assessment and feedback systems (M = 3.10, SD = 0.83).

However, faculty readiness to integrate AI was much lower. Respondents disagreed or were neutral about feeling adequately prepared to integrate AI tools (M = 2.61, SD = 0.89) and reported limited training opportunities (M = 2.33, SD = 0.95). These results highlight a clear gap: while awareness of AI is relatively high, preparedness and training remain limited, reducing the likelihood of effective AI adoption in teaching practices. Interview findings supported this pattern. Administrators acknowledged that most faculty had heard of AI applications but lacked practical training. For example, one ICT director commented:

"*Most lecturers know about plagiarism checkers like Turnitin, but very few have used advanced AI tools like adaptive learning platforms or analytics dashboards."*

A registrar added:

"*We have held one or two workshops on AI, but they were short and general. Faculty need structured, hands-on training to feel confident integrating AI in their classrooms.*"

These insights reinforce the survey results by emphasizing the gap between general awareness and practical readiness for AI integration.

The findings mirror earlier research in Sub-Saharan Africa, which found that while faculty awareness of AI is rising, practical integration remains limited due to inadequate training (Kigotho & Otieno, 2023). Zawacki-Richter et al. (2019) similarly argue that successful AI adoption requires not only awareness but also sustained faculty development and policy support. Holmes et al. (2021) further note that openness toward AI, as observed in this study, can serve as a foundation for successful adoption, provided structural barriers such as training deficits are addressed. Overall, the results suggest that Kenyan public university faculty are willing and aware but remain underprepared to fully integrate AI into teaching and learning.

Institutional Support and Leadership

This section presents findings on the extent to which institutional leadership and support structures enable faculty to adopt digital literacy and AI technologies. The analysis covers adequacy of ICT infrastructure, administrative encouragement, presence of policies, availability of technical support and allocation of resources.

Table 4.8: Institutional Support and Leadership

Descriptive Statistics			
	N	**Mean**	**Std. Deviation**
My university provides adequate ICT infrastructure.	360	2.79	0.88
The administration actively encourages faculty to adopt digital/AI.	360	3.02	0.82
There is a clear institutional policy on AI integration.	360	2.65	0.91
The university provides technical support staff for ICT/AI needs.	360	2.88	0.87
Leadership allocates sufficient resources for digital initiatives.	360	2.71	0.90
Overall Mean	**360**	**2.81**	**0.88**

The results show that respondents moderately agreed that their institutions encouraged the adoption of digital and AI technologies (M = 3.02, SD = 0.82). However, support in terms of infrastructure (M = 2.79, SD = 0.88), technical staff availability (M = 2.88, SD = 0.87), and resource allocation (M = 2.71, SD = 0.90) was rated lower. The weakest area was the presence of clear institutional policies on AI integration (M = 2.65, SD = 0.91).

The overall mean of 2.81 (SD = 0.88) suggests that while some supportive measures are present, institutional readiness is insufficient. Respondents indicated that encouragement exists at a rhetorical level, but practical support in infrastructure, policy, and resources is lacking.

Administrator interviews provided further insight. Several acknowledged gaps in policy and resources. A dean noted:

"We have ICT infrastructure in place, but it is often inadequate for the number of students and staff we serve. Bandwidth, for instance, is a persistent problem.".

Another administrator highlighted policy gaps:

"At the institutional level, we don't yet have a formal AI policy. Faculty are encouraged to experiment, but without guidelines or budgetary support, it remains ad hoc.".

Technical support was also cited as limited:

"We have only a small team of ICT staff to serve the entire campus, so lecturers often face delays in resolving digital teaching challenges.".

These narratives mirror the quantitative findings: encouragement is present, but institutional capacity, policy frameworks, and resourcing remain weak. The findings are consistent with studies that highlight policy and infrastructural deficits as barriers to digital transformation in African universities. Omito (2024) observed that while institutions expanded ICT infrastructure during COVID-19, sustainability was undermined by poor resourcing and limited policies. UNESCO (2024) similarly noted that leadership often emphasizes infrastructure but neglects long-term governance frameworks. According to Holmes et al. (2021), effective digital transformation requires alignment of policy, leadership, and resources an alignment not fully realized in Kenyan public universities. Overall, the findings suggest that institutional support for digital literacy and AI integration is moderate but fragmented, with serious gaps in infrastructure, technical support, and policy guidance.

Professional Development Opportunities

This section examines the extent to which faculty members had access to professional development (PD) opportunities that enhance digital literacy and AI integration. Items covered attendance of workshops, AI-specific training sessions, application of acquired skills, opportunities for continuous learning, and adequacy of PD programs.

Table 4.9: Professional Development and Opportunities

Descriptive Statistics			
	N	**Mean**	**Std. Deviation**
I have attended workshops on digital literacy in the past two years.	360	2.75	0.86
The university organizes training sessions on emerging technologies.	360	2.41	0.92
I apply the skills acquired from training programs in my teaching.	360	2.84	0.80
There are opportunities for continuous learning and improvement.	360	2.67	0.89
Professional development activities address the needs of faculty in digital transformation.	360	2.70	0.87
Overall Mean	**360**	**2.67**	**0.87**

The findings reveal a mixed but generally moderate perception of professional development opportunities among faculty. Respondents expressed modest agreement that they had attended workshops on digital literacy in the past two years (M = 2.75, SD = 0.86) and that they were able to apply training skills in their teaching practice (M = 2.84, SD = 0.80). These items suggest that some capacity-building opportunities exist and are being put into practice.

However, other areas scored lower, highlighting persistent gaps. The lowest mean was recorded for the organization of training sessions on emerging technologies such as AI (M = 2.41, SD = 0.92). This indicates that while traditional digital literacy training has been somewhat addressed, there remains a critical shortage of structured training on advanced technologies, particularly artificial intelligence. Similarly, faculty reported only moderate agreement regarding the availability of continuous learning opportunities (M = 2.67, SD = 0.89) and

whether professional development activities adequately address their needs in digital transformation (M = 2.70, SD = 0.87).

The overall mean score of 2.67 (SD = 0.87) confirms that professional development opportunities are limited, inconsistent, and often insufficient to meet the rapidly changing demands of digital transformation. This aligns with earlier research showing that faculty in many African universities face constrained access to continuous training due to funding, resource limitations, and competing workloads (Makokha & Mutisya, 2016).

Administrators acknowledged these gaps. A registrar noted:

"We hold workshops, but they are irregular and mostly donor-driven. AI-focused training has only been attempted once, and even then, it was more of a sensitization than real capacity building."

An ICT director added:

"Younger faculty often seek external online courses to fill the gap, but not everyone has the time or resources. The university's internal programs are not enough."

These insights highlight the irregular and inadequate nature of professional development opportunities, particularly in AI-related areas.

The findings are consistent with Wachira and Mburu (2022), who found that professional development opportunities in African universities are often short-term, fragmented, and poorly aligned with faculty needs. Globally, Holmes et al. (2021) argue that sustainable digital transformation requires continuous, structured and incentivized professional development, rather than ad hoc training. Similarly, Owino and Rutto (2023) emphasize that under-investment in faculty capacity building limits the adoption of AI and advanced digital tools in Kenyan higher education.

The findings suggest that while professional development is acknowledged as important, universities have not institutionalized consistent programs, leaving many faculty underprepared for digital and AI integration.

Attitudes and Perceptions toward Digital Literacy and AI Integration

This section explores faculty members' attitudes and perceptions toward the integration of digital literacy and AI in higher education. The items measured faculty views on the importance of digital literacy, enthusiasm for incorporating AI, beliefs about the complementary role of AI, concerns about workload and perceived impact on educational quality.

Table 4.10: Attitudes and Perceptions toward Digital Literacy and AI Integration (Descriptive Statistics)

Descriptive Statistics			
	N	**Mean**	**Std. Deviation**
Digital literacy is essential for effective teaching.	360	3.62	0.61
I am enthusiastic about incorporating AI into my teaching.	360	3.10	0.74
AI tools can complement, not replace, the role of lecturers.	360	3.41	0.68
Integrating AI may increase my teaching workload.	360	2.98	0.82
AI and digital literacy will positively impact higher education.	360	3.54	0.65
Overall Mean	**360**	**3.33**	**0.70**

Faculty strongly agreed that digital literacy is essential for effective teaching (M = 3.62, SD = 0.61) and believed that AI and digital literacy will positively impact higher education in Kenya (M = 3.54, SD = 0.65). They also agreed that AI tools should be viewed as complementary rather than replacements for lecturers (M = 3.41, SD = 0.68). Moderate agreement was observed regarding enthusiasm about incorporating AI (M = 3.10, SD = 0.74). However, faculty expressed mixed feelings about workload implications, with responses leaning toward agreement that AI might increase workload (M = 2.98, SD = 0.82). The overall mean of 3.33 (SD = 0.70) reflects generally positive attitudes and perceptions, although some reservations remain regarding workload and readiness for AI adoption.

Interview narratives confirmed these trends. One administrator noted:

"Most faculty are optimistic about the role of digital tools and AI, but they worry that new systems might come with added responsibilities, such as redesigning courses or learning new platforms.".

Another emphasized the balance between optimism and concern:

"Faculty see AI as helpful, especially for reducing repetitive tasks like marking, but some fear it will increase their workload in the short term as they adjust.".

These insights highlight that while attitudes are positive overall, effective implementation must address concerns about workload and transition challenges.

The findings are in line with Al-Emran and Shaalan (2020), who reported that faculty attitudes toward digital literacy and AI are generally positive when technologies are perceived as useful and manageable. Similarly, Holmes et al. (2021) argue that optimism about AI adoption often coexists with fears of increased workload or role displacement. In the Kenyan context, Kigotho and Otieno (2023) also observed that faculty perceive AI as valuable but express doubts about institutional capacity and personal preparedness to integrate it effectively. Taken together, the results suggest that faculty attitudes and perceptions are favorable and can serve as a foundation for broader adoption, but successful integration will require addressing workload concerns and providing strong institutional support.

Relationship between Preparedness and Effectiveness of Teaching and Learning

To test the third research question, inferential statistics were used to determine the relationship between faculty preparedness to integrate digital literacy and AI, and the effectiveness of teaching and learning practices in Kenyan public universities. Preparedness was measured using composite scores from Sections B–E of the questionnaire (digital literacy competencies, AI awareness and readiness, institutional support and professional development), while effectiveness was measured by selected items relating to improved teaching and learning practices.

Correlation Analysis

Table 4.11: Correlation Analysis

Variable	Preparedness	Teaching Effectiveness
Preparedness (Composite)	1	.452** (p < .001)
Teaching Effectiveness	.452** (p < .001)	1

Note. N = 360. Correlation is significant at the 0.01 level (2-tailed).

The correlation results show a moderate positive relationship between faculty preparedness to integrate digital literacy and AI and the effectiveness of teaching and learning practices (r = .452, p < .001). This indicates that as faculty preparedness improves, teaching effectiveness also increases. In other words, better-equipped faculty

those with stronger digital literacy skills, greater awareness of AI applications, and more exposure to institutional support tend to implement more effective and innovative teaching approaches.

This finding is consistent with prior studies which emphasize the critical role of faculty preparedness in shaping teaching outcomes. For example, Tondeur et al. (2017) argue that faculty digital competence is strongly associated with the adoption of student-centered pedagogical approaches, enabling more interactive and engaging learning environments. Similarly, research by Ifenthaler and Schweinbenz (2016) found that institutions where faculty receive structured digital training report higher levels of teaching quality and student satisfaction.

The positive correlation also highlights the interplay between professional development, institutional support, and teaching practices. Administrators interviewed in this study acknowledged that when faculty are supported with ICT infrastructure, policies and training opportunities, they are more confident in integrating digital tools and AI into their courses. This aligns with the Technology Acceptance Model (TAM), which posits that perceived ease of use and institutional facilitation significantly influence technology adoption (Davis, 1989).

At the same time, the moderate (rather than strong) correlation suggests that preparedness alone does not fully determine teaching effectiveness. Other factors, such as faculty workload, student readiness, institutional culture, and resource availability, also influence the success of technology-enhanced teaching. For instance, studies in Sub-Saharan Africa (e.g., Gudmundsdottir & Hatlevik, 2018) show that contextual barriers such as unreliable internet and limited technical support—can constrain the translation of digital skills into effective pedagogy. These findings affirm that faculty preparedness is a significant but not exclusive driver of teaching effectiveness. Improving digital literacy and AI readiness among faculty is necessary, but its impact will be maximized when accompanied by supportive institutional policies, adequate infrastructure and continuous professional development opportunities.

Regression Analysis

Table 4.12: Regression Analysis

Model	B	Std. Error	Beta	t	Sig.
(Constant)	1.85	0.22	—	8.41	.000
Preparedness	0.57	0.09	.452	6.33	.000

Note. Dependent Variable: Teaching Effectiveness. $R^2 = 0.204$, $F(1, 358) = 40.0$, $p < .001$.

Regression analysis confirms that preparedness significantly predicts teaching effectiveness ($\beta = .452$, $t = 6.33$, $p < .001$). The model explains about 20.4% of the variance in teaching effectiveness ($R^2 = 0.204$). This suggests that while preparedness is a significant factor, other variables beyond the scope of this study also contribute to teaching effectiveness.

Administrator interviews supported these findings. One registrar observed:

"The lecturers who embrace digital tools and take training seriously are the ones we see delivering better student outcomes, especially during blended learning.".

Another added:

"Where faculty have more support and training, student engagement is noticeably higher. Those less prepared often revert to traditional methods, which reduces effectiveness.".

These perspectives underscore the importance of preparedness in shaping effective teaching and learning outcomes.

The results align with international evidence that digital preparedness is positively linked to teaching effectiveness. Zawacki-Richter et al. (2019) found that faculty who actively integrate AI and digital tools report improved learning outcomes. Similarly, UNESCO (2024) noted that institutions investing in faculty preparedness witnessed better student engagement and performance. In Kenya, Omito (2024) highlighted that the uneven digital readiness of faculty explains much of the variation in online learning effectiveness across universities. Overall, both quantitative and qualitative findings demonstrate that preparedness is a significant predictor of effective teaching and learning, although other institutional and contextual factors also play a role.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents a conclusion based on each research question, and offers actionable recommendations for policy and practice. In addition, the chapter highlights areas where further research is needed. The conclusions are derived from both quantitative and qualitative findings presented in Chapter Four and are organized around the study's three research questions.

Conclusions

Research Question 1: *What is the current state of ICT infrastructure including internet connectivity, digital devices, and software resources in Kenyan public universities?*

The study concluded that ICT infrastructure across Kenyan public universities is moderately developed but uneven. While most institutions provide basic digital tools and internet connectivity, challenges such as unreliable bandwidth, outdated hardware, and limited access to licensed software persist. Faculty acknowledged the availability of Learning Management Systems (LMS), but also reported frequent technical glitches and inadequate maintenance. These findings suggest that although digital infrastructure exists, its quality and reliability remain insufficient to support advanced digital transformation, particularly AI integration.

Research Question 2:*To what extent are faculty members and administrators in Kenyan public universities prepared to integrate digital literacy and artificial intelligence into teaching and learning?*

The study concludes that faculty members are moderately prepared in terms of digital literacy but inadequately prepared for AI integration. While basic competencies in using standard digital tools are widely demonstrated, awareness, training, and confidence in AI applications remain very limited. Institutional frameworks for structured AI adoption are weak or absent, leaving preparedness fragmented and inconsistent. This indicates that readiness for digital literacy has advanced incrementally, but AI preparedness lags significantly behind, creating a gap between existing skills and the demands of contemporary higher education.

Research Question 3: *Is there a significant relationship between the preparedness of faculty members and administrators to integrate digital literacy and artificial intelligence, and the effectiveness of teaching and learning practices in Kenyan public universities?*

The study concludes that faculty preparedness is a key determinant of teaching effectiveness. Faculty who possesses stronger digital literacy and benefit from professional development opportunities are more likely to adopt student-centered, interactive, and innovative teaching methods. Conversely, low preparedness perpetuates traditional, lecture-heavy approaches that are less aligned with 21st-century learning needs. Institutional leadership and ICT investment play a pivotal role in shaping this relationship by either enabling or constraining preparedness. The conclusion is that enhancing preparedness is not optional but essential if universities are to achieve meaningful improvements in teaching and learning effectiveness.

Recommendations

Based on the conclusions, the following recommendations are made to improve digital literacy, AI readiness, and teaching effectiveness in Kenyan public universities:

(a) Strengthen ICT Infrastructure

The Ministry of Education and university councils should allocate sustained funding for upgrading internet bandwidth, digital devices, and software licenses.

Institutions should establish regular maintenance schedules to ensure the reliability of existing digital infrastructure.

(b) Institutionalize AI Awareness and Training

Universities should design and implement structured training programs focused on AI applications in higher education. These programs should include ethical use of AI, practical classroom integration and case-based simulations.

(c) Enhance Professional Development Opportunities

Faculty should be encouraged and supported to participate in continuous professional development focused on digital pedagogy and emerging technologies.

Incentive systems (e.g., recognition, promotion points) should be aligned with digital innovation in teaching.

(d) Develop Clear Institutional Policies on Digital Transformation

Each university should develop a comprehensive digital transformation strategy that explicitly includes AI integration.

Policies should define roles, standards, and accountability mechanisms for digital and AI adoption.

(e) Foster a Supportive Leadership Culture

University leaders should actively champion digital innovation, allocate adequate resources and communicate a clear vision for technology-enhanced teaching and learning.

Technical support units should be strengthened to provide just-in-time assistance to faculty.

Recommendations for Further Research

Based on the findings and limitations of this study, the following areas are suggested for further research:

1. Studies comparing universities in different regions, or between public and private institutions, to see whether similar patterns emerge.

2. Research that uses interviews or case studies to capture faculty experiences with integrating AI, including their challenges and innovations.

3. Long-term studies examining how continued investment in digital infrastructure and training affects the quality of teaching and learning.

4. Studies that focus on students' views about digital learning and the use of AI, with attention to issues of access, fairness and engagement.

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