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EDUCATION

EFFECTS OF LECTURERS' ICT SKILLS FOR ONLINE LEARNING TRANSFORMATION IN PUBLIC UNIVERSITIES

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ABSTRACT

Purpose of Study: This study examined the effect of lecturers' ICT skills on online learning transformation in public universities in Kenya. The objectives were to assess lecturers' ICT skills and determine how these competencies influence online learning delivery.

Problem Statement: Although institutions have invested in digital infrastructure, limited lecturer competence in developing and administering e-content still poses a challenge, thereby slowing full e-learning integration.

Methodology: The study focused on seven purposively selected public universities and targeted lecturers, ICT staff, registrars and students. A total population of 537 respondents (153 staff and 384 students) participated, selected using stratified and simple random sampling procedures. Grounded on the Technology Acceptance Model and Diffusion of Innovation Theory, the study applied a descriptive quantitative research design. Data were collected using structured questionnaires and interviews, validated through expert review and pilot testing. Reliability was confirmed with Cronbach's alpha values ranging from 0.762 to 0.778. Data were analyzed using SPSS through descriptive and inferential statistics.

Result: Findings revealed that 68.6% of respondents were male, while 56.3% of ICT staff were aged 31–40 years. Students agreed that lecturers could deliver e-content (M=1.890) and use LMS platforms (M=2.000), while ICT staff were uncertain about lecturers' capacity to develop online materials (M=2.743).

Conclusion and Recommendation: The study concludes that online learning transformation depends heavily on ICT skills, and recommends continuous ICT training, enhanced digital support systems and structured e-learning policies.

Keywords: *Capacity building, E-learning, ICT skills, Online learning, Public universities, Technology adoption.*

INTRODUCTION

The integration of Information and Communication Technologies (ICT) into higher education has become a transformative force in teaching, learning and knowledge dissemination globally. The rapid expansion of digital technologies has shifted many universities from traditional face-to-face instruction to blended and fully online teaching models. Worldwide, universities in developed countries such as the United States, China and the United Kingdom have adopted online learning platforms to expand access, flexibility and learner autonomy (He, 2020). Lecturers' digital skills, including ability to design, deliver and assess online learning materials, remain central to the quality of e-learning outcomes (Johnson et al., 2019). The COVID-19 pandemic further accelerated online pedagogy adoption, exposing digital skill gaps among university instructors globally (UNESCO, 2020).

Regionally, African universities have increasingly embraced online learning as part of higher education modernization. However, despite the growing investment in ICT infrastructure, many lecturers still face challenges in digital literacy, e-content development and LMS usage, limiting the effective transition to online-based instruction (Mtebe & Raisamo, 2014). Studies in South Africa and Nigeria reported that although ICT facilities are available, inadequate training and limited pedagogical integration skills hinder adoption (Adebayo & Sule, 2021). This highlights the need for capacity building to strengthen ICT competencies among teaching staff.

In Kenya, public universities have progressively adopted e-learning systems such as Moodle, Google Classroom and institutional learning management systems to support remote learning. However, empirical evidence indicates that the successful transformation of online learning is deeply dependent on lecturers' ICT preparedness and technical skills (Namisiko et al., 2014). While many institutions provide ICT equipment, gaps still exist in content creation, digital pedagogy, online assessment and diversified use of e-learning tools, leading to varied implementation outcomes (Makori, 2014). Therefore, assessing lecturers' ICT skills and their influence on online learning transformation is crucial for enhancing digital education quality and sustainability in Kenyan public universities.

STATEMENT OF THE PROBLEM

The integration of ICT into higher education has become an essential driver for modern instructional delivery, offering flexible, interactive and learner-centered approaches through online platforms. Globally, universities continue to transition from traditional pedagogies to digital learning environments; however, successful transformation is largely dependent on lecturers' ICT preparedness and competency in designing, delivering and evaluating online content. Despite progress, studies reveal persistent gaps in technical skills, digital pedagogy and blended learning capacity among instructors (Johnson et al., 2019). In Africa, many lecturers possess theoretical knowledge but lack adequate training to effectively develop e-content, use learning management systems and conduct online assessments, resulting in limited e-learning uptake (Mtebe & Raisamo, 2014).

In Kenya, public universities have invested in ICT infrastructure, yet the adoption of online teaching remains uneven and inadequate. Evidence indicates that although lecturers are knowledgeable in their subject fields, many lack specialized ICT skills required for online course development, management of e-learning platforms and diversified use of digital tools for instruction (Namisiko et al., 2014). The findings in the current study show that while lecturers

demonstrate the ability to deliver and evaluate e-content, uncertainty exists regarding their capacity to develop online material, utilize e-learning tools diversely and conduct online examinations effectively. This mismatch between infrastructure availability and lecturer ICT proficiency limits the full realization of online learning transformation in public universities. Therefore, it is unclear to what extent ICT skills among lecturers influence the success of online learning, creating a research gap that this study seeks to address.

OBJECTIVES

i. To assess the level of ICT skills among lecturers in public universities in Kenya.

ii. To evaluate the extent to which lecturers' competencies in developing effective online learning implementation in public universities.

Scope of the study

This study focuses on examining the influence of lecturers' ICT skills on online learning transformation in public universities in Kenya. It specifically evaluates competencies related to the development, delivery and evaluation of e-content, as well as the ability to use Learning Management Systems (LMS) and digital tools for instruction. The study covers selected chartered public universities representing diverse academic environments. It targets lecturers, ICT staff, students and administrative personnel as key respondents. The study is limited to ICT skills and does not evaluate infrastructure adequacy or policy frameworks, although these factors are acknowledged as contributors to online learning outcomes.

Limitation of the study

The study encountered several limitations that may influence generalization of findings. Data was collected from selected public universities, meaning results may not fully represent private institutions or all higher learning contexts in Kenya. Self-reported responses through questionnaires present a possibility of bias, as participants may over- or understate their ICT capabilities. The study concentrated mainly on lecturers' ICT skills and did not deeply assess technical infrastructure, funding or organizational readiness, which could also affect online learning implementation. Additionally, time and resource constraints limited the breadth of sample coverage. Despite these limitations, the findings provide valuable insights for policy and practice.

Significance of the study

This study is significant as it contributes to understanding how lecturers' ICT competencies shape online learning transformation in public universities in Kenya. Findings will guide university management in planning targeted ICT capacity-building programs to strengthen e-learning implementation. Policymakers and curriculum developers may use the results to inform digital learning strategies, resource allocation and staff development frameworks. The study also benefits lecturers by highlighting skill areas requiring enhancement for effective online content development, delivery and assessment. Furthermore, it adds to scholarly literature on digital education in developing countries, providing a foundation for future research on ICT adoption in higher education.

LITERATURE REVIEW

The transformation of higher education through ICT has attracted significant global attention as universities increasingly adopt digital platforms to enhance learning flexibility and educational innovation. In many developed regions, ICT competency among lecturers is viewed as fundamental to effective online teaching, as instructors must combine subject expertise with technical skills to design, deliver and manage digital learning content. The Technological Pedagogical Content Knowledge (TPACK) framework illustrates the importance of integrating pedagogy, content and technology, emphasizing that lecturers' digital literacy directly influences the quality of instruction delivered in virtual environments (Koehler & Mishra, 2016). Studies conducted in Europe further demonstrate that lecturers with strong ICT capabilities tend to achieve higher levels of engagement and instructional effectiveness in online classrooms, highlighting the role of digital skills in enhancing student experiences and learning outcomes (Redecker, 2017). These global perspectives collectively underscore the need for lecturers to possess robust ICT skills to facilitate successful online learning transformation.

Regionally, across the African continent, universities have increasingly adopted e-learning initiatives, but many continue to face challenges rooted in limited lecturer preparedness and inadequate digital pedagogy. Although institutions have invested substantially in ICT infrastructure, research consistently shows that lecturers' capacity to integrate these tools into teaching remains insufficient. For example, studies in Ghana reveal that while technological facilities are available, lecturers often lack adequate training in designing online assessments and developing interactive digital learning materials, resulting in reduced instructional effectiveness (Owusu-Fordjour et al., 2020). Similar findings emerge from Tanzania, where many lecturers rely on ICT primarily for basic communication rather than for structured online instructional design, reflecting significant gaps in pedagogical integration and digital content development (Komba & Mwandanji, 2015). These regional insights suggest that the successful implementation of online learning in Africa requires continuous capacity building, targeted professional development and enhanced digital competency among lecturers.

In Kenya, universities have made notable strides in adopting Learning Management Systems (LMS) such as Moodle and Google Classroom to support blended and online learning. However, the effectiveness of these digital platforms is highly dependent on lecturers' ICT competencies, particularly in areas such as e-content development, online delivery and assessment. Research by Wambugu and Kihoro (2018) indicates that limited skills in multimedia content development inhibit lecturers from designing engaging online courses, thereby affecting the depth of digital learning interactions. Similarly, Mutisya and Makokha (2016) report that while lecturers exhibit willingness to adopt ICT, challenges such as low confidence in digital pedagogy, inadequate technical support and limited exposure to e-learning practices hinder full utilization of available technologies. These local studies highlight the ongoing need for structured ICT training and digital capacity enhancement within Kenyan public universities, as lecturer competency remains a critical determinant of effective online learning transformation and sustained digital integration.

THEORETICAL REVIEW

This study is anchored on two major theories that explain the adoption and utilization of ICT in teaching and online learning transformation. The first guiding theory is the Technology Acceptance Model (TAM) by Davis (1989). TAM argues that the acceptance and use of technology depend on perceived usefulness and perceived ease of use. In relation to the first study

objective to assess the level of ICT skills among lecturers and how these skills influence online learning transformation the theory anchors the independent variable (lecturers' ICT skills). It suggests that lecturers with adequate digital skills are more willing and confident to develop, deliver and evaluate e-content, facilitating online learning adoption. Where lecturers perceive ICT tools as beneficial for instruction, they integrate them more effectively, supporting online learning transformation in public universities.

The second theory anchoring the study is the Diffusion of Innovation Theory (DOI) by Rogers (2003). DOI explains how innovations such as e-learning platforms spread within an organization, influenced by factors such as complexity, compatibility, trialability and observability. This theory anchors the second objective to evaluate the extent to which lecturers' competencies in e-content development and delivery contribute to online learning implementation. In this context, lecturers act as adopters of innovation, and their digital competency determines whether they become early adopters or late adopters of online pedagogy. Thus, DOI supports the study by showing that building ICT capacity among lecturers accelerates online learning transformation, leading to improved adoption and teaching outcomes.

METHODOLOGY

The research employed a descriptive quantitative approach to examine lecturers' ICT readiness and its influence on online learning transformation within public universities in Kenya. This design was suitable for obtaining measurable data on ICT competencies and e-learning practices. The study was anchored in a pragmatic philosophy, applying deductive reasoning to test concepts derived from technology adoption theories. The population comprised students and staff from all 39 public universities, out of which seven institutions were purposively chosen to reflect varied operational environments. A total of 537 respondents participated, including 384 students and 153 staff members, selected through a blend of stratified and simple random sampling to ensure balanced representation.

Data collection relied mainly on structured questionnaires and interviews, supported by institutional documents for secondary information. A pilot test involving 20 participants was undertaken to refine the research tools. Reliability was confirmed through Cronbach's alpha values ranging between 0.762 and 0.778, signifying strong internal consistency. Expert evaluation and exploratory factor analysis further validated the instruments. Data were analysed using SPSS, employing descriptive measures along with inferential techniques such as correlation, ANOVA and logistic regression to determine associations among variables. Ethical clearance was obtained from NACOSTI, and participants were informed about the study's purpose, with voluntary participation, confidentiality and anonymity guaranteed throughout the research process.

RESULTS

Gender of the Respondents

The findings are illustrated in Table 1.

Table 1: Gender of the Respondents

Gender	Frequency	Percent
Male	105	68.6
Female	48	31.4
Total	**153**	**100.0**

The results in Table 1 show that male respondents constituted 68.6%, while female respondents represented 31.4% of the sample. Although the number of male participants was higher, both genders were represented in the study population. The distribution suggests that the sample reasonably reflects gender composition within the targeted institutions, indicating that responses were drawn from a diverse group and minimizing concerns of gender-related bias in the findings.

Age of the Respondents

The results are illustrated in Table 2.

Table 1: Age of the Respondents

		Frequency	Percent
Registrar	31-40 years	9	47.4
	41-50 years	3	15.8
	51-60 years	6	31.6
	61-70 years	1	5.3
	Total	**19**	**100.0**
ICT staff	20-30 years	3	18.8
	31-40 years	9	56.3
	41-50 years	3	18.8
	51-60 years	1	6.3
	Total	**16**	**100.0**
Students	15-19 years	12	10.2
	20-25 years	101	85.6
	26-30 years	4	3.4
	31-35 years	1	.8
	Total	**118**	**100.0**

The age distribution in Table 2 indicates that nearly half of the registrars (47.4%) were between 31–40 years, making this the dominant age bracket. This was followed by 51–60 years at 31.6%, 41–50 years at 15.8%, and a smaller proportion 61–70 years at 5.3%. Among ICT staff, the majority (56.3%) also fell within the 31–40-year age category, with equal proportions (18.8%) in both 20–30 years and 41–50 years, while 6.3% were aged 51–60 years. For students, most respondents were youthful, with 20–25 years accounting for 85.6%, followed by 15–19 years (10.2%), 26–30 years (3.4%), and 31–35 years (0.8%). The sample captures a broad age spectrum across respondent groups, particularly reflecting a youthful student population and mid-career professionals among staff. This diversity supports reliable insights into online learning transformation as perspectives were obtained from individuals at varying stages of academic and professional experience.

Number of Years at the university

The findings are illustrated in Table 3.

Table 3: Number of Years at the university

Category	Frequency	Percent
Less than 5 years	8	22.9
5-10 years	14	40.0
11-15 years	10	28.6
16-20 years	3	8.6
Total	**35**	**100.0**

Table 3 presents the duration respondents had been working in their respective universities. The results indicate that 40.0% had served for 5–10 years, representing the majority. Another 28.6% reported 11–15 years of experience, while 22.9% had been in the institution for less than 5 years. A smaller group, 8.6%, had worked between 16–20 years. This distribution shows that most participants had spent a substantial period within their universities, implying adequate exposure to institutional practices, technological adoption processes and instructional systems. Their experience strengthens the reliability of the insights provided, particularly regarding the adoption and use of ICT for online learning transformation.

Lecturers ICT Skills

The third research objective sought to evaluate respondents' perceptions regarding lecturers' ICT competencies and how these skills influence the shift toward online learning in public universities. Participants were required to rate their level of agreement with statements assessing lecturers' ability to develop, deliver and evaluate digital content, manage learning platforms and utilize e-learning tools. The intention was to determine the extent to which lecturers' ICT capacity contributes to the effectiveness of online learning transformation. A summary of responses is presented in Table 4, highlighting how different stakeholder groups viewed the proficiency levels of lecturers in relation to key ICT-related instructional activities.

Table 4: Statements on Lecturers' ICT Skills for Online Learning Transformation

According professionals (ICT staff and Registrar)	Mean	Std. Dev.
I have the ability to develop online content	2.743	1.336
I have the ability to deliver e-content	2.686	1.367
I have the ability to evaluate e-content	2.743	1.245
I have the ability to manage the learning management system	2.486	1.246
There is a diversified use of the tools offered by the E-learning platform	2.600	1.241
I have received in-service training on ICT skills	2.629	1.395
According to Students	**Mean**	**Std. Dev.**
The lecturers have demonstrated the ability to develop online contents	1.983	0.943
The lecturers have demonstrated the ability to deliver e-content	1.890	0.932
The lecturers have demonstrated the ability to evaluate e-content	1.907	0.896
The lecturers have demonstrated the ability to use the learning management system	2.000	0.925
The lecturers have demonstrated diversified skills to use the e-learning platform	2.144	1.064
The lecturers give and mark exams online	2.593	1.207

The analysis applied a mean-score interpretation scale where values below 1.5 indicated strong agreement, 1.5–2.5 agreement, 2.5–3.5 uncertainty, 3.5–4.5 disagreement, and above 4.5 strong disagreement. Based on this coding, ICT staff and registrars generally agreed that lecturers were capable of managing Learning Management Systems (mean = 2.486). However, they expressed uncertainty regarding several other competencies. They were not fully convinced of lecturers' abilities to develop online content (mean = 2.743), deliver e-content effectively (mean = 2.686), or evaluate digital learning materials (mean = 2.743). They also appeared unsure about the extent to which lecturers used a diverse range of e-learning tools (mean = 2.600) and whether they had received adequate in-service ICT training (mean = 2.629).

Students presented a more positive perception of lecturers' ICT capabilities. They agreed that their instructors could deliver e-content effectively (mean = 1.890), develop online learning materials (mean = 1.983), evaluate digital content (mean = 1.907), and navigate the LMS competently (mean = 2.000). Students also acknowledged some diversity in lecturers' use of e-learning tools (mean = 2.144). Despite this, they were unsure whether lecturers were proficient in administering and grading online examinations, as reflected by a mean of 2.593.

These findings collectively suggest that lecturers play a critical role in online learning transformation, and effective digital instruction demands skills in content development, delivery, assessment, LMS use, and online examination administration. The results reinforce conclusions by Namisiko et al. (2014), DeMaagd et al. (2011), Nagunwa and Lwoga (2012), Bariham et al. (2021), and Makori (2014), who emphasise the necessity for ICT competence and continuous instructor training to enhance e-learning integration. The study therefore demonstrates that lecturers' ICT proficiency significantly influences the transition toward digital learning in public universities.

CONCLUSION

The study sought to examine how lecturers' ICT skills influence the transformation of online learning in public universities in Kenya. Findings revealed that while lecturers possess moderate ability to navigate Learning Management Systems, significant gaps still exist in areas such as online content development, delivery, evaluation and diversified use of e-learning tools. Students expressed confidence in lecturers' ability to manage e-content and LMS platforms; however, uncertainties emerged regarding online examination administration and extensive digital tool utilization. Similarly, ICT staff and registrars were unsure about lecturers' preparedness in content creation and e-learning skills, indicating a need for continuous training and digital capacity enhancement.

The results affirm that ICT competency is central to the successful implementation of online learning. Without adequate digital pedagogy, technical proficiency and continuous professional development, the transformation toward online teaching remains limited. Therefore, the study concludes that investing in ICT capacity-building among lecturers is essential to improve e-learning outcomes, enhance instructional quality and strengthen digital integration in higher education. Strengthening ICT skills will enable institutions to deliver flexible, interactive and technology-driven learning environments, positioning universities for future digital advancements and global educational competitiveness.

RECOMMENDATIONS

Based on the findings, the study recommends that public universities prioritize structured and continuous ICT training for lecturers. Capacity-building programs should focus on online content development, digital assessment methods, e-content delivery techniques and effective use of Learning Management Systems. Universities should establish mandatory digital literacy workshops, refresher courses and certification programs that align with emerging technological trends in higher education. Integrating digital pedagogy into staff development policies will enhance lecturers' readiness to adopt e-learning tools confidently.

Secondly, institutions should invest in accessible e-learning infrastructure and provide consistent technical support to lecturers. Digital resource centers, help desks and ICT support units should be strengthened to offer real-time assistance. Universities are also encouraged to incentivize online teaching innovations through recognition, research grants and workload adjustments. Moreover, policy frameworks should be developed to guide online examination administration, content quality standards and digital instructional practices.

In addition, universities should adopt institutional digital readiness frameworks to systematically evaluate their preparedness for online learning transformation. Such frameworks can assess the availability of digital infrastructure, ICT governance structures, staff competencies, institutional culture and levels of technological integration. Establishing or strengthening clear institutional ICT and e-learning policies will help standardize practices, ensure accountability and provide structured guidance for digital teaching processes. These policies should articulate expectations for LMS use, outline quality assurance standards for e-content, and embed digital competencies within performance appraisal and promotion criteria. Regular policy reviews, informed by stakeholder feedback and technological trends, will ensure institutions remain responsive to evolving digital learning needs.

Furthermore, collaboration between universities, government agencies and ICT sector stakeholders should be enhanced to support technology integration and professional development. Such partnerships can promote resource sharing, training opportunities, funding for innovation and benchmarking against global best practices. By implementing these recommendations, universities will improve lecturers' ICT competence, strengthen institutional readiness and accelerate online learning transformation, ultimately enhancing the student learning experience in digital environments.

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