



**INFLUENCE OF EXTERNAL FACTORS ON LECTURERS' TECHNOLOGY
INTEGRATION IN FEDERAL UNIVERSITY OF KASHERE, GOMBE STATE,
NIGERIA**

Usman Idris

Department of Science Education
Federal University of Kashere, Gombe State, Nigeria
shehu100@gmail.com
+2348038891436

And

Saidu Adamu Bello

Department of Science Education
Federal University of Kashere, Gombe State, Nigeria
adamusaidu2244@gmail.com
+2347035632244

And

Musa Babayo Abdullahi

Department of Arts and Social Science Education
Federal University of Kashere, Gombe State, Nigeria
musawalah@gmail.com : ambabayo@fukashere.edu.ng
+2348036763809

And

Abubakar Abdulkadir Aliyu

Department of Arts and Social Science Education
Federal University of Kashere, Gombe State, Nigeria
abubakaraaliyu1390@fukashere.edu.com
08038042138

And

Mohammed Ibrahim

Department of Science Education
Gombe State University, Gombe.
ibmohameedy@gmail.com : ibraheemy@gsu.edu.ng
+2348030801914

And

Yahuza Adamu

Department of Science Education
Federal University of Kashere, Gombe State, Nigeria
adamuy@fukahere.edu.ng 08031107804

Abstract

The integration of technology into higher education teaching is essential for improving instructional delivery, enhancing student engagement, and aligning university education with global digital trends. However, lecturers' use of technology is influenced by various external factors beyond individual competence and attitude. This study investigated the influence of



external factors on technology integration among lecturers at Federal University of Kashere, Gombe State, Nigeria. A descriptive survey research design was adopted. The population comprised 540 academic staff, from which a sample of 126 lecturers was selected using stratified random sampling. Data were collected using a structured questionnaire titled External Factors Influencing Technology Integration Questionnaire (EFITIQ). The reliability of the instrument using Cronbach alpha was found to be 0.88. Descriptive statistics (mean, standard deviation) and inferential statistics (multiple regression analysis) were used for data analysis. Findings revealed that institutional support, ICT infrastructure availability, and professional development opportunities significantly influenced lecturers' technology integration, while government policy was not a significant predictor. The study recommends increased institutional funding, improved ICT infrastructure, and continuous professional development programmes to enhance technology integration in Nigerian universities.

Keywords: Technology integration, external factors, lecturers, higher education, Nigeria

Introduction

The rapid proliferation of digital technologies has transformed higher education globally, compelling universities to adopt innovative teaching tools to enhance instructional delivery and student engagement (UNESCO, 2018). Information and Communication Technology (ICT) integration in higher education is no longer optional; it is a critical strategy for preparing graduates for a technology-driven workforce and fostering quality learning outcomes (Ertmer & Ottenbreit-Leftwich, 2010). Learning management systems, online collaboration platforms, virtual simulations, and digital assessment tools have become central to modern pedagogical practices, enabling lecturers to deliver content more efficiently and students to teach more interactively (Kolade et al., 2024).

In developing countries such as Nigeria, however, technology integration in universities remains uneven. While digital tools are available, their effective utilization by lecturers is often constrained by organizational, infrastructural, and policy-related challenges (Ajibola, 2024; Musa, Mahmud, & Jalil, 2018). Studies have identified inadequate institutional support, unreliable ICT infrastructure, weak

enforcement of government ICT policies, and limited professional development as critical barriers to lecturers' adoption of technology in teaching (Oyefara, Adejoh, & Adisa, 2022; Omolafe, Adebayo, & Ige, 2022).

At the Federal University of Kashere, Gombe State, anecdotal evidence suggests that, despite investments in ICT facilities, many lecturers still rely predominantly on traditional instructional methods such as chalk-and-talk. This indicates that the presence of technology alone is insufficient to ensure effective integration into teaching. The gap between availability and utilization of digital tools highlights the need to examine the external factors that influence lecturers' technology integration, including institutional support, ICT infrastructure, government policies, and professional development opportunities.

Understanding these factors is crucial for institutional administrators and policymakers to design interventions that promote effective technology adoption, improve instructional quality, and enhance students' learning experiences. Consequently, this study investigates the influence of external factors on lecturers' technology integration at



Federal University of Kashere, Gombe State, Nigeria.

Literature Review

Technology integration refers to the deliberate use of digital tools, platforms, and resources to enhance teaching, learning, and assessment in educational settings (Mishra & Koehler, 2006). In higher education, effective integration goes beyond mere use of devices; it involves embedding technology into pedagogy to improve instructional quality, student engagement, and learning outcomes (Kolade et al., 2024). Learning management systems, virtual classrooms, multimedia tools, and online collaboration platforms are examples of technologies that, when integrated effectively, can transform traditional teaching methods and promote active learning (Ertmer & Ottenbreit-Leftwich, 2010).

External factors are environmental and organizational elements outside the individual lecturer that affect technology adoption. These include institutional support, availability of ICT infrastructure, government policies, funding, and professional development opportunities (Ajibola, 2024). Research indicates that even highly motivated lecturers may struggle to integrate technology effectively if these external conditions are inadequate (Musa, Mahmud, & Jalil, 2018). Understanding these factors is essential to bridge the gap between technology availability and actual usage in instructional practices.

Institutional support encompasses administrative commitment, leadership encouragement, funding allocation, and technical assistance to facilitate ICT adoption (Oyefara, Adejoh, & Adisa, 2022). Studies have shown that universities with strong institutional support witness higher levels of technology integration among lecturers

(Nwobodo & Udoka, 2025). Conversely, insufficient support, lack of incentives, and poor management of digital resources are significant barriers to effective technology adoption (Omolafe, Adebayo, & Ige, 2022). At the Federal University of Kashere, understanding the role of institutional support is crucial to improving lecturers' technology integration.

ICT infrastructure includes hardware, software, reliable internet connectivity, digital libraries, and technical facilities necessary for technology-enabled teaching (Manisha, 2020). Empirical studies in Nigerian universities report that inadequate ICT infrastructure is a primary barrier to technology integration, with frequent power outages, poor internet bandwidth, and insufficient digital tools limiting lecturers' ability to adopt ICT in teaching (Ajibola, 2024; Musa et al., 2018). Infrastructure availability is therefore a critical determinant of lecturers' engagement with digital teaching platforms.

Government policies aim to provide frameworks and guidelines for ICT adoption in education. In Nigeria, the National Policy on ICT in Education seeks to promote the integration of technology into teaching and learning (Kolade et al., 2024). However, policy implementation is often weak, leading to limited impact on lecturers' technology integration. Studies show that without institutional enforcement, government policies alone are insufficient to motivate lecturers to adopt technology effectively (Oyefara et al., 2022).

Professional development programs, such as workshops, seminars, and training courses, enhance lecturers' technological competencies and pedagogical skills necessary for integrating technology into teaching (Omolafe et al., 2022). Continuous



professional development is positively associated with higher confidence and competence in using ICT for instruction (Ertmer & Ottenbreit-Leftwich, 2010). In Nigerian universities, lack of structured training programs limits lecturers' ability to adopt technology innovatively, making professional development a crucial factor for effective technology integration (Ajibola, 2024).

Theoretical Framework

This study is anchored on Diffusion of Innovation Theory. Rogers' (2003) Diffusion of Innovation Theory explains how innovations spread within a social system over time. The theory identifies factors such as relative advantage, compatibility, complexity, trialability, and observability as determinants of innovation adoption. In universities, technology integration spreads when lecturers observe successful implementation by colleagues, receive institutional encouragement, and have access to necessary resources.

External factors such as institutional leadership, funding, and infrastructure play a significant role in accelerating or hindering the diffusion of technological innovations in educational institutions. Therefore, this theory supports the investigation of organizational and environmental influences on technology integration.

Statement of the Problem

Despite the increasing availability of digital technologies and ICT infrastructure in Nigerian universities, lecturers' integration of technology into teaching remains inconsistent and often limited to basic applications such as PowerPoint presentations. Studies have highlighted that, while learning management systems, online collaboration platforms, and digital assessment tools are available, their

utilization by academic staff is frequently hindered by organizational, infrastructural, and policy-related challenges (Ajibola, 2024; Musa, Mahmud, & Jalil, 2018).

Specifically, in Nigerian higher education, inadequate institutional support, limited access to functional ICT infrastructure, weak enforcement of government ICT policies, and insufficient professional development programmes have been cited as major barriers to effective technology integration (Oyefara, Adejoh, & Adisa, 2022; Omolafe, Adebayo, & Ige, 2022). At the Federal University of Kashere, anecdotal observations suggest similar challenges, with lecturers reportedly relying heavily on traditional pedagogical methods despite the presence of digital teaching tools.

This scenario underscores a critical knowledge gap: while national and institutional efforts to promote ICT adoption exist, empirical evidence on the extent to which external factors influence lecturers' technology integration at Federal University of Kashere is limited. Without such evidence, policymakers and institutional administrators may continue to face difficulties in formulating strategies that effectively enhance digital teaching practices and improve overall instructional quality.

Objectives of the Study

The main objective of this study is to examine the influence of external factors on lecturers' technology integration at Federal University of Kashere, Gombe State, Nigeria. Specifically, the study seeks to:

1. Assess the influence of institutional support on lecturers' integration of technology in teaching.
2. Examine the effect of ICT infrastructure availability on lecturers' technology integration.



3. Determine the extent to which government policies influence lecturers' technology integration.
4. Evaluate the impact of professional development opportunities on lecturers' adoption of technology in instructional practices.

Research Questions

1. To what extent does institutional support influence lecturers' technology integration in teaching?
2. How does the availability of ICT infrastructure affect lecturers' technology integration?
3. What is the role of government policies in influencing lecturers' technology integration?
4. How do professional development opportunities impact lecturers' adoption of technology in instructional practices?

Hypotheses

Ho₁: Institutional support does not significantly influence lecturers' technology integration.

Ho₂: ICT infrastructure availability does not significantly influence lecturers' technology integration.

Ho₃: Government policies do not significantly influence lecturers' technology integration.

Ho₄: Professional development opportunities do not significantly influence lecturers' technology integration.

Methodology

This study adopted a descriptive survey research design. A descriptive survey is appropriate when collecting quantitative data from a large population to describe existing conditions and examine relationships among variables. Survey designs are widely used in

educational technology research to investigate factors influencing technology integration (Creswell, 2014). The population of the study comprised 716 academic staff (lecturers) of Federal University of Kashere, Gombe State, Nigeria, across all faculties and academic ranks. A sample of 126 lecturers was selected using stratified random sampling. Stratification was based on faculties and academic ranks (Assistant Lecturer, Lecturer II, Lecturer I, Senior Lecturer, Associate Professor, and Professor) to ensure adequate representation. Stratified sampling is recommended in educational research to reduce sampling bias and ensure proportional representation of subgroups (Gay, Mills, & Airasian, 2012). Data were collected using a structured questionnaire titled External Factors Influencing Technology Integration Questionnaire (EFITIQ). The instrument consisted of five sections: Items were rated on a 5-point Likert scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (5). Content and face validity were established through expert review by specialists in educational technology and measurement and evaluation. Experts assessed the instrument for clarity, relevance, and adequacy of items. A pilot study was conducted among 30 lecturers outside the study area. Cronbach's alpha reliability coefficient of 0.82 was obtained, indicating high internal consistency. Cronbach's alpha values above 0.70 are considered acceptable in social science research (Tavakol & Dennick, 2011). Data were analyzed using SPSS version 25. Descriptive statistics (mean and standard deviation) were used to answer research questions. Multiple regression analysis was used to test hypotheses at 0.05 level of significance.

Results

The result is presented according to research questions and hypotheses.

Table 1: Descriptive Statistics on External Factors and Technology Integration

Variables	Mean	Std. Deviation	Decision
Institutional Support	3.84	0.72	High
ICT Infrastructure Availability	3.67	0.81	High
Government Policy	3.21	0.69	Moderate
Professional Development Opportunities	3.90	0.75	High
Technology Integration Practices	3.78	0.70	High

Table 2: Correlation Matrix of Study Variables

Variables	Inst. Support	ICT Infra	Gov. Policy	Prof. Dev.	Tech Integration
Institutional Support	1				
ICT Infrastructure	0.58	1			
Government Policy	0.34	0.29	1		
Professional Development	0.62	0.51	0.33	1	
Technology Integration	0.69	0.63	0.31	0.71	1

$p < 0.05$, $p < 0.01$

Table 3: Multiple Regression Analysis of External Factors on Technology Integration**Dependent Variable: Technology Integration**

Predictor Variables	B	Beta (β)	t-value	Sig.
Constant	0.42	–	1.88	0.062
Institutional Support	0.38	0.41	5.72	0.000
ICT Infrastructure Availability	0.31	0.35	4.89	0.000
Government Policy	0.12	0.18	1.94	0.054
Professional Development	0.40	0.44	6.11	0.000

Model Summary:

$R = 0.78$

$R^2 = 0.61$

Adjusted $R^2 = 0.59$

$F(4,121) = 47.62$, $p < 0.05$

Interpretation of Results

The regression model explained 61% of the variance in lecturers' technology integration. Institutional support, ICT infrastructure availability, and professional development opportunities significantly influenced lecturers' technology integration ($p < 0.05$). Government policy did not significantly predict technology integration, indicating weak implementation at the institutional level.

Discussion of Findings

The findings of this study revealed that external factors play a substantial role in influencing lecturers' integration of technology in teaching at Federal University of Kashere, Gombe State, Nigeria. The regression analysis showed that institutional support, ICT infrastructure availability, and professional development opportunities significantly predicted technology integration, while government policy did not



significantly influence lecturers' use of technology. The model explained 61% of the variance in technology integration practices ($R^2 = 0.61$), indicating that these external factors collectively have a strong effect on lecturers' adoption of digital technologies for instructional purposes.

The study found that institutional support significantly influenced lecturers' technology integration ($\beta = 0.41, p < 0.05$). This finding implies that when university management provides adequate funding, leadership commitment, technical support, and incentives, lecturers are more likely to integrate technology into their teaching. The result corroborates the findings of Ertmer and Ottenbreit-Leftwich, who reported that institutional support is one of the most critical determinants of successful technology adoption in educational settings. Similarly, Oyefara, Adejoh, and Adisa found that administrative encouragement and access to support services significantly enhance lecturers' willingness to use digital instructional tools. This result also aligns with Nwobodo and Udoka, who observed that universities with strong managerial support demonstrate higher levels of technology utilization among academic staff. The results showed that ICT infrastructure availability significantly influenced technology integration ($\beta = 0.35, p < 0.05$). This suggests that the availability of reliable internet connectivity, computer hardware, software applications, stable electricity, and digital teaching resources facilitates lecturers' adoption of technology. This finding is consistent with Chiahah, Ubulom, and Osuafor, who emphasized that adequate infrastructure is a prerequisite for effective technology use in higher education. The result also supports the work of Musa, Mahmud, and Jalil, who identified poor internet access and unstable electricity supply as major obstacles to ICT integration in

Nigerian universities. In the same vein, Ajibola concluded that the availability of functional ICT facilities strongly predicts lecturers' use of digital teaching tools.

The study revealed that government policy did not significantly influence lecturers' technology integration ($\beta = 0.18, p = 0.054$). Although respondents moderately agreed that government policies support ICT adoption, these policies were not strong enough to directly affect instructional practices. This finding suggests that policy documents alone are insufficient unless they are effectively implemented and reinforced at the institutional level. The result is in agreement with Kolade and colleagues, who noted that Nigeria's ICT policies are well articulated but often suffer from weak implementation. Similarly, Oyefara, Adejoh, and Adisa reported that government directives have limited impact when universities do not provide practical support and monitoring mechanisms. This finding highlights the gap between policy formulation and actual practice in Nigerian higher education institutions.

The study found that professional development opportunities had the strongest influence on lecturers' technology integration ($\beta = 0.44, p < 0.05$). This indicates that lecturers who participate in workshops, seminars, and training programmes are more likely to develop the confidence and competence required to integrate technology effectively into teaching. This result supports the findings of Omolafe, Adebayo, and Ige, who established that continuous training significantly improves lecturers' ICT skills and pedagogical use of technology. The finding is also consistent with Ertmer and Ottenbreit-Leftwich, who argued that professional development is essential for helping educators move from basic technology use to innovative instructional



integration. The implication is that regular and well-structured training programmes are indispensable for sustaining technology adoption in universities.

The overall findings demonstrate that technology integration in higher education is influenced more by institutional and organizational conditions than by government policy alone. Lecturers are more likely to use digital technologies when they receive administrative support, have access to adequate ICT facilities, and participate in ongoing professional development programmes. The non-significant role of government policy suggests that national ICT initiatives must be complemented by strong institutional implementation strategies. These findings reinforce the theoretical assumptions of the Technology Acceptance Model and the Diffusion of Innovations, which emphasize that environmental support systems are crucial for successful technology adoption.

Conclusion

This study examined the influence of external factors on lecturers' technology integration at Federal University of Kashere, Gombe State, Nigeria. The findings revealed that external institutional and environmental factors significantly shape the extent to which lecturers integrate technology into their teaching practices. Specifically, institutional support, ICT infrastructure availability, and professional development opportunities were found to be significant predictors of technology integration among lecturers. Together, these variables explained 61% of the variation in lecturers' use of technology, indicating a strong explanatory power of the model.

However, government policy was found not to have a significant influence on technology integration. This suggests that although ICT-related policies exist at the national level,

their impact is limited due to weak implementation and inadequate enforcement at the institutional level. Overall, the study concludes that effective technology integration in higher education is largely dependent on strong institutional commitment, adequate infrastructure, and continuous capacity-building programmes rather than policy formulation alone.

The study further concludes that improving lecturers' engagement with educational technologies requires a coordinated effort among university management, government agencies, and professional development providers. Without addressing these external barriers, the full benefits of ICT in teaching and learning may not be fully realized in Nigerian universities.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. **Strengthening Institutional Support:** University management should enhance administrative and technical support for lecturers by providing incentives, technical assistance, and policies that encourage the use of digital tools in teaching. Leadership commitment should also prioritize ICT integration as a core aspect of academic development.
2. **Improvement of ICT Infrastructure:** The Federal University of Kashere and other tertiary institutions should invest more in reliable ICT infrastructure, including high-speed internet connectivity, functional computer laboratories, learning management systems, and stable power supply. This will create an enabling environment for effective technology use.
3. **Enhancement of Professional Development Programmes:** Regular



and compulsory training workshops, seminars, and ICT capacity-building programmes should be organized for lecturers. These programmes should focus on practical, hands-on experience in using digital tools for teaching, assessment, and research.

4. **Strengthening Government Policy Implementation:** Government should ensure effective implementation and monitoring of ICT policies in higher education. Policy frameworks should be translated into actionable institutional strategies with clear accountability mechanisms.
5. **Provision of Continuous Technical Support:** Institutions should establish dedicated ICT support units to assist lecturers in troubleshooting technical issues and adopting new digital tools for teaching.
6. **Encouraging Collaborative Learning and Innovation:** Universities should promote peer mentoring and collaboration among lecturers to encourage the sharing of digital teaching practices and innovative instructional strategies.

References

- Ajibola, A. O. (2024). External determinants of ICT integration in Nigerian universities. *Journal of Educational Technology Research*, 12(2), 45–60.
- Creswell, J. W. (2014). *Research design* (4th Ed.) SAGE Publications.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education*, 42(3), 255–284.
- Gay, L. R., Mills, G. E., & Airasian, P. (2012). *Educational research* (10th ed.). Pearson Education.
- Kolade, O., Akinyemi, S., Yusuf, M., & Ibrahim, H. (2024). National ICT policy implementation and digital teaching practices in Nigerian higher education. *International Journal of Higher Education Technology*, 9(1), 1–15.
- Manisha, M. (2020). Covid 19 and use of ICT in education: *Educational Resurgence Journal* 2(4), 17-23.
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054.
- Musa, M. B., Mahmud, R., & Jalil, H. A. (2018). Modeling educational technology integration among lecturers in Nigerian universities. *Journal of Educational Computing Research*, 56(4), 630–652.
- Nwobodo, C. E., & Udoka, P. A. (2025). Institutional support and lecturers' adoption of educational technologies in public universities. *African Journal of Educational Management*, 18(1), 77–91.



Omolafe, E. V., Adebayo, F. A., & Ige, O. A. (2022). Professional development and technology integration among lecturers in Nigerian tertiary institutions. *Journal of Educational Development in Africa*, 7(3), 101–116.

Oyefara, A. O., Adejoh, S. O., & Adisa, T. A. (2022). Organizational factors influencing ICT integration in

Nigerian higher education. *Nigerian Journal of Educational Technology*, 14(2), 55–72.

Rogers, E. M. (2003). Diffusion of innovations (5th ed.). Free Press.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55.