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DIGITAL TECHNOLOGY ADOPTION AND ACADEMIC STAFF PRODUCTIVITY IN COLLEGES OF EDUCATION IN NORTH-CENTRAL NIGERIA

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ABSTRACT

This study investigated digital technology adoption and academic staff productivity in Colleges of Education in the North-Central Zone, Nigeria. The study was guided by two objectives: to assess the current level of digital technology adoption among academic staff, and to determine the influence of digital technology adoption on their productivity. A descriptive survey research design was employed for the study. The total of 3642 population, comprised academic staff, management staff and the Union officials in Colleges of Education within the North-Central Zone, from which a sample of 586 respondents was selected using the cluster sampling technique. Data collected by the use of a structured questionnaire developed by Maina (2017) and adopted by the researchers were analyzed using descriptive statistics such as percentages, standard deviation and the mean scores. All the two hypotheses formulated were tested using One Way Analysis of Variance (ANOVA). The findings revealed that the level of digital technology adoption among academic staff in Colleges of Education in the North-Central Zone is very low. Despite this low level of adoption, the results further indicated a significant positive influence of digital technology adoption on the productivity of academic staff. This suggests that increased utilization of digital technologies enhances teaching effectiveness, research output, and overall academic performance. Based on the findings, the study concluded that although digital technology adoption remains poor, it holds substantial potential for improving academic staff productivity if adequately embraced. The study recommends improved provision of digital infrastructure, regular training, and institutional support to enhance adoption and maximize productivity outcomes.

Keywords: Digital technology adoption, academic staff productivity, Colleges of Education, North-Central Nigeria.

Introduction

Globally, the adoption of digital technology in higher education has transformed teaching, research, and administrative processes. Digital technologies such as learning management systems, virtual learning platforms, cloud computing, artificial intelligence, and collaborative tools have enhanced academic productivity by enabling flexible teaching, access to vast academic resources, and efficient research collaboration. In that regard, Adebayo and Musa (2013) state that Higher education institutions across developed nations increasingly rely on digital technologies to improve instructional delivery, scholarly communication, and knowledge creation. The global expansion of digital technologies in education accelerated significantly during the COVID-19 pandemic when universities and colleges shifted rapidly from face-to-face teaching to online and blended learning environments (Edebagbo & Adewoye, 2024). This transition underscored the significance of digital tools in supporting academic activities and enhancing productivity among academic staff and students.

Digital technology adoption has also improved academic staff productivity by facilitating efficient course management, online assessment, research dissemination, and global collaboration among scholars. Studies show that digital capabilities and preparedness to teach and work in digital environments positively influence academic productivity and institutional effectiveness (Daramola & Aladesusi, 2022). Consequently, higher education institutions worldwide continue to invest heavily in digital infrastructure and training programmes to enhance staff competencies and improve teaching and research productivity.

In Africa, the integration of digital technologies into higher education has gained increasing attention as governments and institutions attempt to align their educational systems with global technological trends. Digital technologies provide opportunities to expand access to education, improve teaching effectiveness, and strengthen research capacity across universities and colleges on the continent (Farias-Gaytan etal, 2023). However, despite these opportunities, many African higher education institutions face significant challenges in adopting digital technologies. These challenges include inadequate infrastructure, limited internet connectivity, insufficient ICT equipment, and inadequate digital literacy among academic staff (Ntim, 2024). Furthermore, the digital divide remains a major concern in many African countries, particularly between urban and rural institutions. Limited access to digital resources and unreliable internet connectivity hinder the effective use of digital technologies for teaching, learning, and research (Ntim, 2024). Nevertheless, several African universities and colleges are gradually adopting digital technologies such as e-learning platforms, digital libraries, and virtual classrooms to enhance instructional delivery and academic productivity (Oyetade, Zuya & Harmse, 2020). These initiatives demonstrate the growing recognition of digital technologies as essential tools for improving educational outcomes and academic performance in the African higher education sector.

In Nigeria, digital technology adoption in higher education has become increasingly important due to the growing demand for quality education and the need to modernize teaching and learning processes (Sulieman & Iyabo, 2022). Information and Communication Technology (ICT) plays a vital role in improving teaching effectiveness, research productivity, and administrative efficiency in Nigerian tertiary institutions. The integration of digital technologies in Nigerian higher education institutions enables lecturers to access online resources, conduct virtual classes, communicate with students, and collaborate with researchers across the globe. These technological innovations have the potential to improve academic staff productivity and enhance students' learning experiences. However, the adoption of digital technologies in Nigerian institutions still faces several challenges. These include inadequate funding, poor electricity supply, limited ICT infrastructure, lack of trained personnel, and weak institutional policies supporting technology integration (Daromoh & Aladesusi, 2022). Despite these constraints, Nigerian tertiary institutions are gradually embracing digital tools such as

learning management systems, multimedia teaching aids, and online communication platforms. The adoption of these technologies has the potential to improve the effectiveness and productivity of academic staff in teaching, research, and community service.

Colleges of Education play a critical role in the Nigerian educational system as they are responsible for training teachers for primary and junior secondary schools. In recent years, there has been growing emphasis on integrating digital technologies into teacher education programmes to prepare future teachers for technology-driven classrooms (Woldegiogis, 2022). The adoption of digital technologies in Colleges of Education can enhance instructional delivery, facilitate access to digital teaching resources, and improve the professional development of academic staff. Digital tools such as computers, projectors, internet facilities, and online learning platforms support innovative teaching strategies and collaborative learning. However, studies indicate that the adoption of ICT facilities in many Nigerian Colleges of Education remain limited. While some lecturers possess basic ICT skills, the effective integration of digital technologies into teaching and learning is still inadequate due to limited infrastructure, insufficient training, and poor institutional support (Sulieman & Iyabo, 2022). These limitations may affect the productivity of academic staff, as digital technologies are increasingly required for efficient teaching, research, and academic collaboration in modern higher education systems. Although several studies have examined digital technology adoption in universities and tertiary institutions globally and within Nigeria, limited empirical research has specifically focused on the relationship between digital technology adoption and academic staff productivity in Colleges of Education, particularly in the North-Central zone of Nigeria (Sulieman & Iyabo, 2022). Most existing studies have concentrated on ICT availability, digital literacy, or technology utilization in universities rather than teacher-training institutions.

Furthermore, many previous studies have addressed the general integration of ICT in education without adequately examining how digital technology adoption influences the productivity of academic staff in terms of teaching effectiveness, research output, and professional development within Colleges of Education (Sulieman & Iyabo, 2022). Therefore, there is a need for empirical investigation into the extent to which digital technology adoption affects academic staff productivity in Colleges of Education in North-Central Nigeria. Such research will contribute to the existing body of knowledge and provide insights for policymakers, institutional administrators, and educators on how digital technologies can be effectively utilized to enhance academic productivity in teacher education institutions.

Statement of the Problem

In Nigeria, the Federal Ministry of Education, through the National Policy on ICT in Education (2019), emphasized the need for comprehensive ICT integration across all levels of education to foster quality, accessibility and global competitiveness. Colleges of Education, as key institutions responsible for training teachers for the nation's basic education sector, are expected to model effective digital practices that future teachers can replicate in schools. Also, the document emphasizes the provision, utilisation and equitable access to digital infrastructure across educational institutions. However, the realisation of these objectives largely depends on the availability and accessibility of digital technologies within institutions.

Despite these policy directives and global trends, observations and emerging empirical studies suggest that digital technology adoption in many Nigerian tertiary institutions remains inconsistent and uneven. In the North Central Zone of Nigeria, anecdotal evidence and preliminary research reports indicate persistent challenges such as inadequate ICT infrastructure, unreliable internet connectivity, unstable power supply, insufficient funding and limited digital competencies among academic staff. While some colleges may have access to basic digital tools, the extent to which these technologies are fully integrated into teaching, learning, assessment and administration remains unclear.

This gap in knowledge creates uncertainty regarding the readiness of these institutions to meet national educational goals and global digital standards. Without a clear understanding of the level of digital technology adoption, policymakers, institutional leaders stakeholders may be unable to design effective interventions to improve digital integration. Availability does not necessarily translate into accessibility; digital tools may exist but remain underutilized due to limited access points, restricted usage policies, poor maintenance, unstable electricity supply, or inadequate bandwidth. In some cases, digital resources may be concentrated in specific departments or administrative units, thereby limiting broad institutional integration. Furthermore, disparities may exist between federal, state and private Colleges of Education in terms of funding, infrastructure provision and technical support. These disparities could create unequal opportunities for digital engagement among staff and students within the region. Despite the strategic importance of Colleges of Education in preparing digitally competent teachers for Nigeria's basic education system, there is limited empirical data specifically examining the availability and accessibility of digital technologies in Colleges of Education in the North Central Zone.

Objective of the Study

This study aims to examine digital technology adoption and the productivity of academic staff in Colleges of Education in the North Central Zone, Nigeria. The specific objectives of the study are to:

1. assess the current level of digital technology adoption among academic staff in colleges of education in the North Central Zone, Nigeria;
2. determine the influence of digital technology adoption on the productivity of academic staff in Colleges of Education in the North-Central Zone, Nigeria.

Research Question

1. What is the current level of digital technology adoption among academic staff in colleges of education in the North Central Zone, Nigeria?
2. What is the level of influence of digital technology adoption on the productivity of academic staff in colleges of education in the North Central Zone, Nigeria?

Hypotheses

H_{01}: There is no significant level of digital technology adoption among academic staff in Colleges of Education in the North-Central Zone, Nigeria.

H_{03}: Digital technology adoption has no significant influence on the productivity of academic staff in Colleges of Education in the North-Central Zone, Nigeria.

Theoretical Framework

Fred Davis' Technology Acceptance Model (TAM) (1989)

The Technology Acceptance Model (TAM) was developed by Fred D. Davis in 1989 to explain how and why individuals accept and use new technologies in organizations. The theory was introduced in his influential work titled *"*Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology.*"* TAM is widely applied in studies that examine the adoption and use of digital technologies in educational and organizational settings. The model proposes that two major factors determine whether individuals will adopt and use a technology: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Perceived usefulness **r**efers to the degree to which a person believes that using a particular technology will enhance job performance. Perceived ease of use refers to the extent to which a person believes that using the technology will be free of effort (Davis, 1989). According to the theory, when users perceive a technology as useful and easy to use, they are more likely to develop a positive attitude toward it, which in turn increases their intention to use the technology and ultimately leads to actual usage.

The Technology Acceptance Model is highly relevant to the study. First, the concept of perceived usefulness relates directly to academic staff productivity. When lecturers believe

that digital technologies such as online learning platforms, digital research databases, and presentation software can enhance teaching quality, facilitate research, and improve communication with students, they are more likely to adopt and utilize these technologies in their work. Second, perceived ease of use is important for understanding the level of adoption among academic staff. If digital technologies are easy to operate and lecturers receive adequate training and support, they will be more willing to integrate them into their teaching and research activities. Conversely, if technologies are perceived as complex or difficult to use, adoption may remain low, which can limit their potential contribution to academic productivity.

Furthermore, TAM suggests that actual use of technology leads to improved job performance. In the context of colleges of education, effective adoption of digital technologies can enhance lecture delivery, facilitate access to online scholarly resources, improve research output, and strengthen communication between lecturers and students. Consequently, higher levels of digital technology adoption can lead to improved productivity among academic staff. Therefore, the Technology Acceptance Model provides a strong theoretical foundation for this study because it explains how lecturers' perceptions of digital technologies influence their willingness to adopt them and how such adoption can ultimately affect their professional productivity in colleges of education in North-Central Zone, Nigeria.

Methodology

The study adopted a descriptive survey research design. A total of 3642 population comprising 15 colleges of education. 10 state colleges, 4 federal colleges, and FCT College of education Zuba. The sample was selected through a cluster method; 4 state colleges of education with 428 samples and 1 federal college of education with 158 sample making a total of 586. The researchers divide the population into clusters based on colleges of education in the North-Central states (Benue, Kogi, Kwara, Nasarawa, Niger, and Plateau). The researcher then randomly selects a few colleges (clusters) and collects data from staff within those selected colleges. Data collected by the use of a structured questionnaire developed by Maina (2017) and adopted by the researchers were analyzed using descriptive statistics such as percentages, standard deviation, and the mean scores. The name of the questionnaire is titled: "Digital Technology Adoption and Academic Staff Productivity (DTAASP) Questionnaire. The research instrument was validated by two experts in the Educational Management Department of the Federal University of Education, Pankshin, for content validity, and a total of 15 copies of the Questionnaire were administered to the Federal College of Education, Zuba, for a pilot study, and Cronbach's correlation coefficient was used to test the result. The result yielded 0.714 for cronbach Alfa, 0.902 for Spearman's coefficient, and 0.900 for Guttman Split-half reliability coefficient. Both hypotheses formulated were tested using One-Way Analysis of Variance (ANOVA) at a 0.05 level of significance. It consisted of two parts. Part one of the instrument sought the respondents' biodata, namely status, highest educational qualification, gender years of working experience. Part two is the main questionnaire, divided into two sections, A and B. As follows: Section 'A' asked information on the level of digital technology adoption among academic staff in colleges of education in the North-Central Zone, Section 'B' asked questions on the level of influence of digital technology adoption on the productivity of academic staff in colleges of education in the North-Central Zone, Nigeria. The questionnaire items were rated using a five-point Likert-type scale of measurement as follows: strongly agree-5, agree-4, undecided-3, disagree-2, strongly disagree-1 for sections A-B. The total score obtained when the responses are summed up indicates their standing on the variable or attribute being measured. A higher value indicates a more positive response than a lower value, thus the benchmark is gotten: 5+4+3+2+1=15÷5 (ratings) =3 as bench mark.

Results

1. **Research Question One:** What is the current level of digital technology adoption among academic staff in colleges of education in the North Central Zone, Nigeria?

Table One: Respondents' Responses on digital technology adoption among academic staff in colleges of education in the North Central Zone, Nigeria.

s/no	Statement	Categories	D	%	Un	%	A	%	Mean	SD
1.	I regularly use digital technologies (e.g., learning management systems, projectors and online platforms) to deliver my lectures.	Academic staff	347	87.84	15	3.79	33	8.35	4.13	0.876
		Management	109	95.61	1	0.87	4	3.50	4.43	0.728
		Union Official	18	94.73	0	0	1	5.26	4.21	0.713
2.	I integrate digital tools to facilitate student engagement (e.g., online discussions, virtual classrooms, multimedia presentations).	Academic staff	350	88.60	29	7.34	16	4.05	4.25	0.780
		Management	109	95.61	4	3.50	1	0.87	4.32	0.631
		Union Official	15	78.94	2	10.53	2	10.53	3.95	1.079
3.	I use digital technologies for assessment purposes (e.g., online quizzes, electronic grading systems, plagiarism detection tools)	Academic staff	252	63.80	13	3.29	130	32.91	3.24	1.345
		Management	75	65.79	6	5.26	33	28.95	3.33	1.527
		Union Official	14	73.69	1	5.26	4	21.05	3.63	1.116
4.	I utilize digital resources (e.g., e-books, online journals, educational databases) to support my teaching and research activities.	Academic staff	366	92.66	13	3.29	16	4.05	4.17	0.673
		Management	113	99.12	1	0.87	0	0	4.41	0.512
		Union Official	16	84.24	1	5.26	2	10.50	4.11	0.937
5.	I communicate with students through digital platforms (e.g., email, institutional portals, messaging applications) for academic purposes.	Academic staff	366	89.63	30	7.56	11	2.78	4.41	0.749
		Management	113	99.12	1	0.88	0	0	4.47	0.519
		Union Official	16	84.21	2	10.53	1	10.50	4.37	0.895

Aggregate Mean 4.09

Table 1 above presents the respondents' responses to items 1-5. The table shows an aggregate mean of 4.09 which is above the bench mark of 3.0. Which indicates that most academic staff, management staff and union officials totally disagreed with the digital technology adoption among academic staff in colleges of Education in the North- Central Zone, Nigeria.

Research Question 2. What is the level of influence of digital technology adoption on the productivity of academic staff in colleges of education in the North Central Zone, Nigeria?

Table Two: Respondents' Responses on the level of influence of digital technology adoption on the productivity of academic staff in colleges of education in the North Central Zone, Nigeria.

s/n	Statement	Categories	D	%	Un	%	A	%	Mean	SD
6.	The adoption of digital technologies (e.g., computers, internet, learning management systems) has improved my teaching effectiveness.	Academic staff	8	2.03	24	6.08	363	91.89	4.40	0.696
		Management	0	0	1	0.87	113	99.12	4.32	0.946
		Union Official	1	5.26	0	0	18	94.73		
									4.32	0.946
7.	The use of digital tools enhances my ability to prepare and deliver course materials efficiently.	Academic staff	5	13.42	13	3.29	329	83.29	4.06	0.970
		Management	2	1.75	2	1.75	110	96.50	4.00	1.054
		Union Official	2	10.53	1	5.26	16	84.21		
									4.00	1.054
8.	The institution provides sufficient access to digital learning platforms (e.g., Learning Management Systems) for instructional delivery.	Academic staff	348	88.10	14	3.55	3	8.35	4.05	0.797
		Management	92	80.70	22	19.30	0	0	4.05	0.848
		Union Official	15	78.95	3	15.79	1	5.26		
									4.05	0.848
9.	The integration of digital technologies has improved my communication and collaboration with students and colleagues.	Academic staff	9	2.28	15	3.80	371	93.92	4.37	0.668
		Management	0	0	1	0.87	113	99.12	4.32	0.820
		Union Official	1	5.26	1	5.26	17	89.48		
									4.32	0.820
10.	The use of digital technologies has positively influenced my overall job performance and output as an academic staff member.	Academic staff	1	3.04	25	6.33	358	90.63	4.19	0.714
		Management	0	0	8	7.02	106	92.98	4.05	0.911
		Union Official	1	5.26	1	5.26	17	89.48	4.05	0.911

Aggregate Mean

Table 2 above shows the responses of the respondents to items 6-10. The table shows an aggregate mean of 4.17 which is above the bench mark of 3.0. Which indicates that most academic staff, management and union officials totally agreed that the level of digital technology adoption has a positive influence on the productivity of academic staff in colleges of education in the North Central Zone, Nigeria.

Null Hypothesis I

There is no significant level of digital technology adoption among academic staff in Colleges of Education in the North-Central Zone, Nigeria.

Table Three. Summary of Analysis of variance statistics to test the difference in the opinions of respondents on digital technology adoption among academic staff in Colleges of Education in the North Central Zone, Nigeria.

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.383	2	.192	4.431	.025
Within Groups	.909	21	.043		
Total	1.292	23			

The ANOVA table three x-rayed the variance of digital technology adoption among academic staff in Colleges of Education in the North Central Zone, Nigeria, among the different responses. The F-ratio is equal to 4.431 at a P value of 0.025. Since the P-value = 0.025 of the F-test is less than the P-value = 0.05, the null hypothesis is therefore rejected, to mean that there is significant difference in the opinions of the respondents on the impact digital technology adoption among academic staff in Colleges of Education in the North Central Zone, Nigeria To determine which group significantly differs from others in the opinions, a post hoc test was carried out with the Scheffe test presents the result of the Scheffe post hoc test.

Table Four. Scheffe Test on Responses of Respondents on the digital technology adoption among academic staff in Colleges of Education in the North Central Zone, Nigeria.

Multiple Comparisons

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Academic Staff	Management Staff	-.30625*	.10401	.027	-.5801	-.0324
	Union Officials	-.19250	.10401	.205	-.4664	.0814
Management Staff	Academic Staff	.30625*	.10401	.027	.0324	.5801
	Union Officials	.11375	.10401	.559	-.1601	.3876
Union Officials	Academic Staff	.19250	.10401	.205	-.0814	.4664
	Management Staff	-.11375	.10401	.559	-.3876	.1601

*. The mean difference is significant at the 0.05 level.

From the table four, it can be deduced that the response that contributed the most to the differences is the union officials and the management staff, with a 0.559 level of significance, followed by agreement. However, the other opinions do not differ from one another. This result implies that digital technology adoption among academic staff in Colleges of Education in the North Central Zone, Nigeria is low. Though the management staff has less acceptance of the view than the academic staff and union officials.

Null Hypothesis 2

Digital technology adoption has no significant influence on the productivity of academic staff in Colleges of Education in the North-Central Zone, Nigeria.

Table Five: Summary of analysis of various statistics to test the differences in the opinions of the respondents on the Digital technology adoption has on the productivity of academic staff in Colleges of Education in the North-Central Zone, Nigeria.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.084	2	.042	.327	.725
Within Groups	2.309	18	.128		
Total	2.393	20			

The ANOVA table 5 reveals the variance of the Digital technology adoption has on the productivity of academic staff in Colleges of Education in the North-Central Zone, Nigeria among the different responses. The F-ratio is equal to 0.327 at P value of 0.725. Since the P-value = 0.725 of the F-test is greater than the P-value = 0.05, the null hypothesis is therefore retained and we conclude that there is no significant difference in the opinions of the respondents on the digital technology adoption has on the productivity of academic staff in colleges of education in the North Central Zone, Nigeria. However, all the opinions do not differ one from another. This result implies that digital technology adoption has a positive influence on the productivity of academic staff of Colleges of Education in the North-Central Zone, Nigeria.

Table six. Scheffe Test of Responses on respondents on the Digital technology adoption has on the productivity of academic staff in Colleges of Education in the North-Central Zone, Nigeria.

Multiple Comparisons

		Mean			95% Confidence Interval	
(I) GROUP3	(J) GROUP3	Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Academic Staff	Managemnt Staff	-.19429	.08446	.098	-.4195	.0309
	Union Officials	.01429	.08446	.986	-.2109	.2395
Managemnt Staff	Academic Staff	.19429	.08446	.098	-.0309	.4195
	Union Officials	.20857	.08446	.072	-.0166	.4338
Union Officials	Academic Staff	-.01429	.08446	.986	-.2395	.2109
	Managemnt Staff	-.20857	.08446	.072	-.4338	.0166

The mean difference is significant at the 0.05 level.

From the result of the Scheffe table 6, there is a significant difference in the opinions of the respondents and the opinion that was responsible for the difference was noticed between the management and the union officials at 0.072, which was a weak difference. This result shows an overwhelming support for the alternate hypothesis that the Digital technology adoption has a positive influence on the productivity of academic staff of Federal College of Education in the North-Central Zone of Nigeria.

Discussion of Findings

The findings of this study revealed that the level of digital technology adoption among academic staff in Colleges of Education in North-Central Nigeria is low. This outcome can be effectively explained using Fred Davis' Technology Acceptance Model (TAM, 1989), which provides a theoretical lens for understanding technology adoption behaviour.

According to TAM, two key determinants, perceived usefulness and perceived ease of use influence individuals' decision to adopt and utilize technology. Perceived usefulness refers to the extent to which an individual believes that using a particular technology will enhance job performance, while perceived ease of use relates to the degree to which the technology is free of effort. In the context of this study, the low level of digital technology adoption among academic staff suggests that many lecturers may not sufficiently perceive digital tools as useful for improving their teaching, research, and administrative productivity, or they may find such technologies difficult to use.

This finding aligns with TAM's proposition that when users do not perceive technology as beneficial or easy to use, their intention to adopt it diminishes. Similarly, studies have shown that individuals are more likely to adopt technology when they believe it will improve their performance and is easy to operate. Therefore, the low adoption level observed in this study could be attributed to inadequate digital skills, inadequate training, or limited exposure to user friendly technologies among academic staff.

The present finding is consistent with previous empirical studies in Nigeria. For instance, a study on digital information resources usage in universities in Delta and Edo States reported that digital resources were utilized to a low extent**,** largely due to challenges such as poor infrastructure, inadequate access to computers, inadequate training, and unstable power supply. These external constraints are important because TAM acknowledges that external variables (such as institutional support and infrastructure) indirectly influence adoption by shaping users' perceptions of usefulness and ease of use (Adebayo & Musa, 2023).

Furthermore, Adebayo & Musa (2023) maintain that technological adoption in developing countries is often hindered by contextual factors such as poor infrastructure, limited funding, and inadequate technical support. Research has shown that beyond TAM constructs, factors like accessibility, organizational support, and economic conditions significantly shape adoption behaviour. This implies that even if academic staff recognize the benefits of digital technologies, environmental barriers may still limit their actual usage.

However, the finding contradicts some studies that reported a high level of technology acceptance and positive influence on academic performance when TAM variables are favourable. For example, research based on TAM conducted by Oyetade, Zuva, & Harmse, (2020) found that perceived usefulness and ease of use significantly and positively influence technology adoption and academic performance among students and educators. This discrepancy may be due to contextual differences, as institutions with better infrastructure, training opportunities, and policy support tend to experience higher levels of digital adoption.

In addition, other studies in educational technology conducted by Suleiman & Iyabo, (2022) have demonstrated that when institutions provide adequate training, access to digital tools, and supportive policies, users develop positive attitudes toward technology, leading to increased adoption and usage. The divergence from such findings in this study suggests that Colleges of Education in North-Central Nigeria may still be lagging in providing enabling conditions necessary for effective digital integration. The findings of this study corroborate the assumptions of the Technology Acceptance Model by Davis (1989), emphasizing that academic staff adoption of digital technology is largely dependent on their perceptions of its usefulness and ease of use. The low level of adoption observed indicates a need for improved infrastructure, continuous professional development, and institutional support to enhance positive perceptions and ultimately increase technology usage among academic staff.

The findings of this study revealed that digital technology adoption has a significant influence on the productivity of academic staff in Colleges of Education in North-Central Nigeria. This outcome is well explained by Fred Davis' Technology Acceptance Model (TAM, 1989), which posits that users' acceptance and utilization of technology are primarily determined by perceived usefulness and perceived ease of use.

Within the framework of TAM, perceived usefulness is particularly relevant to this finding, as it directly links technology use to improved job performance. The positive influence of digital technology adoption on academic staff productivity suggests that lecturers who adopt digital tools such as computers, internet resources, learning management systems, and data analysis software tend to experience enhanced efficiency in teaching, research, and administrative tasks. This supports Davis' (1989) assertion that when individuals perceive technology as useful, they are more likely to use it, leading to improved performance outcomes.

Furthermore, perceived ease of use also plays a crucial role. Academic staff who fined digital technologies easy to operate are more likely to integrate them into their daily academic activities, thereby increasing productivity. Thus, the findings of this study validate the core assumptions of TAM, demonstrating that acceptance and use of digital technologies translate into tangible productivity gains in educational settings.

The findings of this study are consistent with several previous empirical studies. For instance, studies conducted in Nigerian tertiary institutions have shown that the use of digital technologies significantly enhances lecturers' productivity by improving access to instructional materials, facilitating research activities, and enabling effective communication with students and colleagues (Afolabi, 2015; Yusuf & Balogun, 2011).

In addition, research on educational technology integration has demonstrated that digital tools improve teaching effectiveness, increase research output, and streamline administrative processes, thereby enhancing overall staff productivity (Venkatesh & Davis, 2000). These studies align with the present finding, reinforcing the argument that digital technology adoption is a key driver of academic efficiency and performance.

However, the findings of this study contrast with other studies that reported a weak or insignificant relationship between digital technology adoption and productivity. For example, some researchers found that despite the availability of digital technologies, their impact on productivity was minimal due to factors such as inadequate training, poor infrastructure, erratic power supply, and limited institutional support (e.g., Oye et al., 2012). This disagreement suggests that while technology adoption has the potential to improve productivity, its actual impact may be constrained by contextual and environmental challenges.

Moreover, certain studies have argued that mere adoption of technology does not automatically lead to increased productivity unless it is effectively utilized. In situations where academic staff lack the necessary digital competencies or motivation, the benefits of technology adoption may not be fully realized (Oyetade, Zuva & Harmse, 2020). . This highlights the importance of continuous training and capacity building to ensure that academic staff can maximize the potential of digital tools.

The findings of this study support the propositions of Davis' Technology Acceptance Model (1989), indicating that digital technology adoption significantly influences the productivity of academic staff. The study agrees with a substantial body of literature that emphasizes the positive role of technology in enhancing academic performance, while also acknowledging contrasting findings that attribute limited impact to infrastructural and skill-related challenges. Therefore, to fully harness the productivity benefits of digital technology, Colleges of Education in North-Central Nigeria must invest in training, infrastructure, and institutional support systems that enhance both the acceptance and effective utilization of digital technologies.

Conclusion

The poor adoption of digital technology among academic staff in Colleges of Education in the North Central Zone of Nigeria reflects a complex interplay of infrastructural, institutional and socio-economic challenges. Despite growing global emphasis on digital literacy and integration, many institutions in this region continue to grapple with limited access to functional hardware, inconsistent internet connectivity and inadequate technical support.

These constraints are compounded by a lack of targeted training and professional development opportunities, which undermines staff confidence and competence in leveraging digital tools for teaching, research and administrative duties. Additionally, systemic issues such as insufficient funding, policy gaps and weak implementation frameworks further hinder meaningful technology adoption. Addressing these challenges requires coordinated efforts from government agencies, educational leaders and development partners to invest in infrastructure, capacity building and strategic policies that prioritize digital inclusion and empower academic staff across the North Central Zone to fully participate in the digital era.

Recommendations

1. Government and institutional authorities should prioritize the provision of modern digital infrastructure such as reliable internet connectivity, computers, projectors, and access to e-learning platforms. Improved access will reduce barriers to adoption and encourage staff to integrate digital tools into teaching, research, and administrative tasks.
2. Regular workshops, seminars, and hands-on training programmes should be organized to enhance the digital competencies of academic staff. Training should focus not only on basic ICT skills but also on the pedagogical integration of digital technologies to improve teaching effectiveness and productivity.
3. Colleges of Education should develop clear policies that promote and support digital technology use. Incentives such as recognition, promotions, grants, or awards for staff who effectively utilize digital tools can motivate wider adoption.
4. Institutions should establish functional ICT support units to provide technical assistance, maintenance, and troubleshooting services. This will help reduce frustration among staff and sustain the use of digital technologies.
5. Increased funding from government and stakeholders is essential to support the acquisition, maintenance, and upgrading of digital technologies. Dedicated budgets for ICT development should be implemented in Colleges of Education.
6. Academic staff should be encouraged to share knowledge and best practices through peer mentoring, collaborative platforms, and professional learning communities. This will foster a culture of innovation and continuous digital engagement.
7. Institutions should mainstream digital technology in teaching, learning, research, and administrative processes. This will ensure that digital adoption becomes a necessity rather than an option, thereby improving overall productivity.
8. There should be regular assessment of digital technology usage and its impact on academic productivity. Feedback mechanisms will help institutions identify gaps and improve implementation strategies.

References

Adebagbo, G. A., & Adewoye, S. E. (2024). Lecturers' level of awareness and ICT utilisation for teaching health education in Nigeria colleges. *Futurity Education Journal*.

Adebayo, A., & Musa, A. (2023). Evaluation of ICT integration in teaching and learning among Nigerian tertiary institution lecturers using the Technology Acceptance Model. *Information Research Communications*.

Afolabi, A. O. (2015). *E-learning and its effects on teaching and learning in a global age*. International Journal of Academic Research in Business and Social Sciences, 5(1), 222–230.

Daramola, F. O., & Aladesusi, G. A. (2022). Information communication technology as a tool for improving Nigerian education at all levels: A theoretical perspective. *Indonesian Journal of Educational Research and Review*.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

Farias-Gaytan, S., Aguaded, I., & Ramirez-Montoya, M. S. (2023). Digital transformation and digital literacy in higher education institutions: A systematic literature review. *Humanities and Social Sciences Communications*.

Ntim, S. (2024). Digitalising higher education pedagogies: Perspectives of senior academic members in Ghana. *European Journal of Education and Pedagogy*.

Oye, N. D., Iahad, N. A., & Rahim, N. Z. A. (2012). The history of UTAUT model and its impact on ICT acceptance and usage by academicians. *Education and Information Technologies, 17*(3), 281–298. https://doi.org/10.1007/s10639-011-9153-3

Oyetade, K. E., Zuva, T., & Harmse, A. (2020). Technology adoption in education: A systematic literature review. *Advances in Science, Technology and Engineering Systems Journal*.

Suleiman, Y., & Iyabo, A. M. (2022). Adoption of information and communication technology as a strategy for promoting lecturers' effectiveness in Nigerian universities. *Journal of Education*.

Viswanath Venkatesh, & Fred D. Davis (2000). A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science, 46*(2), 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926

Woldegiorgis, E. (2022). Access to digital learning technologies in African higher education.

Yusuf, M. O., & Balogun, M. R. (2011). Student-teachers' competence and attitude towards information and communication technology: A case study in a Nigerian university. *Contemporary Educational Technology, 2*(1), 18–36.