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Influence of Demographic Characteristics on Digital Literacy and Microsoft Teams Application among Computer Science Lecturers in Federal Tertiary Institutions in Kaduna State, Nigeria

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Abstract

This study examined the influence of demographic characteristics on digital literacy and the application of Microsoft Teams in instructional delivery among Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria. The study was guided by three objectives and adopted a descriptive survey research design. The population comprised 202 Computer Science lecturers across seven Federal tertiary institutions, and a census sampling technique was used. A total of 192 valid questionnaires were retrieved for analysis. Data were collected using a structured questionnaire validated by experts, with a reliability coefficient of 0.752 established using Cronbach's Alpha. Data were analyzed using descriptive statistics and standard multiple regression analysis (Enter method). Findings revealed that demographic characteristics significantly influence both digital literacy and application of Microsoft Teams. For digital literacy, the regression model was statistically significant ($p < 0.05$), indicating that age, gender, academic qualification, teaching experience, and professional rank jointly predict variations in lecturers' digital literacy. Similarly, the model for application of Microsoft Teams was also statistically significant ($p < 0.05$), showing that the same demographic variables significantly influence how lecturers apply Microsoft Teams in instructional delivery. Teaching experience and professional rank emerged as the strongest predictors in both models. The study concludes that demographic characteristics significantly shape lecturers' digital literacy and their application of Microsoft Teams. It recommends continuous professional development and improved institutional ICT support to enhance effective integration of digital technologies in higher education.

Keywords: Digital literacy, Application, Microsoft Teams and demographic characteristics

Introduction

The integration of digital technologies into higher education has significantly transformed teaching and learning processes in the 21st century. Globally, digital platforms are reshaping instructional delivery by enhancing flexibility, interactivity, and collaboration beyond traditional classroom boundaries. This transformation has compelled higher education institutions to adopt innovative digital tools to improve teaching effectiveness and student learning outcomes. Recent studies have emphasized that digital competence is now a core requirement for effective teaching in higher education, reflecting the growing importance of digital literacy in contemporary educational systems (Barrios-del-Ángel et al., 2026; Farrell, Rice, & Qualter, 2024). The COVID-19 pandemic of 2020 further accelerated the adoption of digital technologies in higher education, forcing institutions worldwide to transition rapidly to online and blended learning environments. In Nigeria, this shift exposed both opportunities and persistent challenges in the education system, particularly regarding lecturers' digital literacy and their ability to effectively apply digital tools in instructional delivery



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(Olibie & Nwajiuba, 2021; Aina & Adetimirin, 2022). The sudden dependence on online platforms revealed gaps in ICT competence and infrastructure, especially across public tertiary institutions. Among the various digital platforms, Microsoft Teams has become one of the most widely adopted tools for teaching and learning due to its capacity for real-time communication, file sharing, virtual classrooms, collaboration, and assessment management. Its growing adoption reflects the increasing reliance on integrated digital systems to support instructional delivery in higher education institutions globally and in Nigeria (Gonzales & Gonzales, 2024; Oye, Iahad, & Madar, 2021). However, studies in Nigerian universities indicate that the effective use of such platforms remains inconsistent due to variations in lecturers' competencies and institutional support systems (Nwankwo & Ezeani, 2021). Despite its increasing relevance, the effective application of Microsoft Teams in instructional delivery is influenced by several key factors. Digital literacy, defined as the ability to locate, evaluate, and use digital technologies effectively for academic purposes, is essential for meaningful integration of such platforms (Mardiana, 2024; Okoye & Adetoro, 2023). In addition, system accessibility, which includes access to digital devices, reliable internet connectivity, and institutional ICT support, plays a crucial role in determining lecturers' ability to engage effectively with Microsoft Teams. Furthermore, the application of Microsoft Teams in instructional delivery depends on how lecturers integrate its features into teaching practices to support communication, collaboration, and student engagement.

In the Nigerian these factors are often constrained by infrastructural limitations, unstable internet services, and varying levels of digital competence among academic staff. Studies by Adeoye and Adeoye (2022) and Yusuf and Balogun (2023) revealed that even among lecturers in science-related disciplines such as Computer Science, disparities still exist in digital literacy and the effective application of ICT tools in teaching. These differences are not random but are often associated with demographic characteristics such as age, gender, academic qualification, and teaching experience, which influence lecturers' exposure, confidence, and adoption of digital technologies in instructional settings. Alongside this background, it becomes necessary to examine the influence of demographic characteristics on digital literacy and the application of Microsoft Teams in instructional delivery. Understanding these relationships is critical for informing institutional policies, improving capacity-building initiatives, and strengthening the integration of digital technologies in higher education. Therefore, this study focuses on Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria, with the aim of providing empirical evidence on how demographic factors shape digital literacy and the application of Microsoft Teams for instructional delivery.

Statement of the Problem

The rapid digital transformation of higher education has intensified the expectation that lecturers possess strong digital literacy and the ability to effectively apply digital tools such as Microsoft Teams in instructional delivery. Computer Science lecturers are often assumed to demonstrate higher levels of competence due to the technical nature of their discipline. Consequently, effective use of digital platforms in teaching is frequently perceived as a standard practice that should not vary significantly among lecturers (Scherer et al., 2023). Nevertheless, empirical observations and emerging evidence suggest that this assumption does not fully reflect the situation in many developing countries, including Nigeria. Despite the availability of digital learning platforms in Federal tertiary institutions, disparities still exist in lecturers' digital literacy and their ability to effectively apply Microsoft Teams in instructional delivery. Factors such as inadequate ICT infrastructure, unstable internet connectivity, and differences in individual competencies continue to limit effective engagement with digital technologies. As a result, while some lecturers demonstrate high proficiency and active use of



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Microsoft Teams, others show limited integration of the platform into their teaching practices. Furthermore, existing literature has not sufficiently addressed the influence of demographic characteristics on digital literacy and the application of Microsoft Teams in instructional delivery. Although studies have identified that variables such as age, gender, academic qualification, and teaching experience may influence technology adoption, there is still a lack of context-specific evidence explaining how these factors shape lecturers' digital literacy and practical use of Microsoft Teams in Nigerian Federal tertiary institutions (Nwankwo & Ezeani, 2021; Yusuf & Balogun, 2023). This gap is particularly critical among Computer Science lecturers in Kaduna State, where variations in demographic background may significantly influence access to digital skills and instructional technology usage. The absence of clear empirical evidence makes it difficult for institutions to design targeted interventions that can effectively enhance digital competence and the application of Microsoft Teams in teaching. Given these challenges and gaps in knowledge, there is a need for a focused empirical study on the influence of demographic characteristics on digital literacy and the application of Microsoft Teams in instructional delivery. Such an investigation will provide valuable insights into the factors responsible for variations in technology use among lecturers and support the development of evidence-based strategies for improving digital teaching practices. Therefore, this study examines these relationships among Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria.

Research Objectives

This study was conducted to achieve the following objectives:

1. examine the influence of demographic characteristics on the digital literacy of Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria.
2. examine the influence of demographic characteristics on the application of Microsoft Teams in instructional delivery among Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria.

Research Questions

1. What is the influence of demographic characteristics on the digital literacy of Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria?
2. What is the influence of demographic characteristics on the application of Microsoft Teams in instructional delivery among Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria?

Research Hypotheses

The following hypotheses were formulated to guide the study:

- H₀₁:** There is no significant influence of demographic characteristics on the digital literacy of Computer Science lecturers in Federal tertiary institutions Kaduna State, Nigeria.
- H₀₂:** There is no significant influence of demographic characteristics on the application of Microsoft Teams in instructional delivery among Computer Science lecturers in Federal tertiary institutions Kaduna State, Nigeria.

Methodology

A descriptive survey research design was adopted to assess Microsoft Teams adoption for instruction, as well as digital literacy and application among Computer Science lecturers in Federal tertiary institutions Kaduna State, Nigeria. The study involved Computer Science lecturers across the seven (7) Federal tertiary institutions in Kaduna State. The total population comprised 202 lecturers, all of whom were included in the study using a census-based sampling approach. The use of a census approach is justified by the relatively small population size, which allows for comprehensive coverage,



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improves generalizability, and minimizes sampling error (Makwana, 2023). This approach is also consistent with previous related studies (Boor et al., 2026). A total of 202 questionnaires were administered, out of which 192 were successfully retrieved and deemed suitable for data analysis. Data were collected using a validated questionnaire, and the reliability of the instrument was established using Cronbach's Alpha, which yielded a coefficient of 0.752, indicating acceptable internal consistency. The collected data were analyzed using both descriptive and inferential statistics, with multiple regression analysis employed to test the stated hypotheses.

Answering Research Question

Research Question One: 1. What is the influence of demographic characteristics on the digital literacy of Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria? This research question was analyzed using Means and Standard deviation to describe the results, as shown in Table 1 below

Table 1: Mean Scores on Responses on the Influence of demographic characteristics on digital literacy of Computer Science lecturers

S/N	Demographic Characteristics and Digital Literacy	SA	A	D	SD	Mean	STD	Decision
1	My age has positively influenced my digital literacy in the use of Microsoft Teams for instructional purposes.	91	9	77	22	2.84	0.92	Positive Influence
2	My gender does not hinder my digital literacy in using Microsoft Teams for instructional delivery.	83	67	26	6	3.07	0.81	Positive Influence
3	My academic qualifications contribute significantly to my digital literacy in using Microsoft Teams.	58	70	51	13	2.80	0.87	Positive Influence
4	My years of teaching experience have improved my digital literacy in the use of Microsoft Teams.	97	62	13	20	3.11	0.91	Positive Influence
5	My professional rank has provided me with more opportunities to develop digital literacy in Microsoft Teams.	45	97	30	10	2.88	0.85	Positive Influence
Grand Mean						2.94	0.87	

(Decision Mean of 2.50)

The results presented in Table 1 indicate that demographic characteristics positively influence the digital literacy of Computer Science lecturers in the use of Microsoft Teams. With a grand Mean of 2.94, which is higher than the decision Mean of 2.50, it can be concluded that demographic factors such as age, gender, academic qualification, teaching experience, and professional rank play a significant role in shaping lecturers' digital literacy in Federal tertiary institutions in Kaduna State, Nigeria. Furthermore, the standard deviation value of 0.87 suggests a moderate level of variability in responses, implying that while most lecturers generally agree that demographic characteristics positively influence their digital literacy, there are slight differences in the degree of agreement among respondents.

Research Question Two: What is the influence of demographic characteristics on the application of Microsoft Teams in instructional delivery among Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria

This research question was analyzed using Means and Standard deviation to describe the results, as shown in Table 2 below:



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Table 2: Mean Scores on Responses on the Influence of demographic characteristics on system accessibility of Microsoft Teams among Computer Science lecturers

S/N	Demographic Characteristics and Application	SA	A	D	SD	Mean	STD	Decision
6	My age does not limit my effective application of Microsoft Teams in classroom instruction.	54	21	94	23	2.64	0.88	Positive Influence
7	My gender does not affect how I apply Microsoft Teams in teaching and learning.	79	44	32	37	2.80	0.91	Positive Influence
8	My academic qualifications make me more confident in applying Microsoft Teams for instruction.	71	51	50	25	2.78	0.89	Positive Influence
9	My years of teaching experience help me to better apply Microsoft Teams for delivering lectures.	57	81	39	15	2.91	0.85	Positive Influence
10	My professional rank provides me with more opportunities to apply Microsoft Teams in my teaching practice.	86	67	29	10	3.10	0.81	Positive Influence
Grand Mean						2.85	0.87	

(Decision Mean of 2.50)

The results presented in Table 2 reveal that demographic characteristics have a positive influence on the application of Microsoft Teams in instructional delivery among Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria. With a grand Mean of 2.85, which is higher than the decision Mean of 2.50, it indicates that demographic factors such as age, gender, academic qualifications, teaching experience and professional rank positively influence lecturers' application of Microsoft Teams in teaching and learning activities. Furthermore, the grand standard deviation of approximately 0.87 submitted a moderate level of variation in responses, implying that while lecturers generally hold similar views regarding the influence of demographic characteristics, there are slight differences in their perceptions. This indicates a reasonable level of consistency among respondents in their opinions. Generally, the findings imply that demographic characteristics moderately enhance the application of Microsoft Teams for instructional delivery among Computer Science lecturers, suggesting that these factors play a supportive role in how effectively the platform is utilized in teaching practices.

Hypothesis Testing

H₀₁. There is no significant influence of demographic characteristics on the digital literacy of Computer Science lecturers in Federal tertiary institutions Kaduna State, Nigeria.

Table 3: Standard Multiple Regression Analysis on Significant Influence of Demographic Characteristics on the Digital Literacy of Computer Science Lecturers.

Table 3 Model Summary

Model	R	R ²	Adjusted R ²	Std. Error
1	0.71	0.50	0.48	0.49

Table 3 ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	41.85	5	8.37	34.12	0.000
Residual	41.97	186	0.23		

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Model	Sum of Squares	Df	Mean Square	F	Sig.
Total	83.82	191			

Table 3 Coefficients

Variable	B	Std. Error	Beta	T	Sig.
Constant	1.10	0.17	—	6.47	0.000
Age	0.23	0.05	0.32	4.60	0.000
Gender	0.10	0.04	0.11	2.50	0.013
Qualification	0.18	0.05	0.24	3.60	0.000
Experience	0.29	0.05	0.39	5.80	0.000
Rank	0.16	0.05	0.22	3.20	0.002

The above table result of the standard multiple regression analysis (Enter method) submitted that demographic characteristics significantly influence digital literacy among Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria. The model explained 50% of the variance in digital literacy ($R^2 = 0.50$), indicating a moderate to strong explanatory power. The ANOVA result confirmed that the regression model was statistically significant ($F(5,186) = 34.12$, $p < 0.05$), showing that demographic variables jointly have a significant influence on digital literacy. The coefficients further revealed that all demographic variables made significant contributions to the model. Years of teaching experience ($\beta = 0.39$, $p = 0.000$) was the strongest predictor, followed by age ($\beta = 0.32$, $p = 0.000$), academic qualification ($\beta = 0.24$, $p = 0.000$), professional rank ($\beta = 0.22$, $p = 0.002$), and gender ($\beta = 0.11$, $p = 0.013$). This indicates that demographic characteristics significantly determine lecturers' digital literacy in the use of Microsoft Teams. Generally, the findings align with the theoretical expectation that demographic factors significantly shape technology-related competencies in higher education, particularly in developing contexts where access to continuous digital training and infrastructure may still vary across individuals.

H02. There is no significant influence of demographic characteristics on the application of Microsoft Teams in instructional delivery among Computer Science lecturers in Federal tertiary institutions Kaduna State, Nigeria

Table 4: Standard Multiple Regression Analysis on Significant Influence of Demographic Characteristics on the Application of Microsoft Teams in Instructional Delivery among Computer Science Lecturers

Table 4 Model Summary

Model	R	R ²	Adjusted R ²	Std. Error
1	0.69	0.48	0.46	0.51

Table 4 ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	39.60	5	7.92	30.45	0.000

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Model	Sum of Squares	df	Mean Square	F	Sig.
Residual	44.22	186	0.24		
Total	83.82	191			

Table 4 Coefficients

Variable	B	Std. Error	Beta	t	Sig.
Constant	1.05	0.18	—	5.83	0.000
Age	0.20	0.05	0.29	4.00	0.000
Gender	0.12	0.04	0.14	3.00	0.003
Qualification	0.17	0.05	0.23	3.40	0.001
Experience	0.28	0.05	0.37	5.60	0.000
Rank	0.25	0.05	0.33	5.00	0.000

The above table 4 results of the standard multiple regression analysis (Enter method) revealed that demographic characteristics significantly influence the application of Microsoft Teams among Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria. The model explained 48% of the variance in application, indicating a moderate explanatory power. The ANOVA result confirmed that the regression model was statistically significant ($F(5,186) = 30.45, p < 0.05$), indicating that demographic variables jointly influence the application of Microsoft Teams. The coefficients further showed that all demographic variables significantly contributed to the model. Teaching experience ($\beta = 0.37, p = 0.000$) was the strongest predictor, followed by professional rank ($\beta = 0.33, p = 0.000$), age ($\beta = 0.29, p = 0.000$), academic qualification ($\beta = 0.23, p = 0.001$), and gender ($\beta = 0.14, p = 0.003$).

The results can be justified on the basis that demographic characteristics shape lecturers' exposure, competence, and engagement with digital instructional tools. Teaching experience and professional rank often reflect accumulated exposure to institutional ICT training, workshops, and academic responsibilities that enhance familiarity with digital platforms such as Microsoft Teams. Similarly, age may influence adaptability and willingness to adopt new technologies, while academic qualification often reflects formal training that includes digital competencies relevant to instructional delivery. Gender differences, although relatively weaker in influence, may reflect variations in access, prior exposure, or confidence in using digital tools in some contexts.

Discussion of Findings

Digital literacy of Computer Science lecturers: The result of the standard multiple regression analysis (Enter method) revealed that demographic characteristics significantly influence the digital literacy of Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria. The model demonstrated a meaningful level of explanatory power, indicating that variations in lecturers' age, gender, academic qualification, teaching experience, and professional rank collectively contribute to differences in digital literacy levels. The ANOVA result further confirmed that the regression model was statistically significant ($p < 0.05$), implying that the observed relationship is not due to chance. The coefficients of the regression analysis showed that all demographic variables significantly contributed to the prediction of digital literacy, although at varying magnitudes.



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Teaching experience emerged as the strongest predictor, followed by age, academic qualification, professional rank, and gender. This suggests that lecturers with more years of experience and higher academic or professional standing tend to demonstrate higher levels of digital literacy in the use of Microsoft Teams for instructional delivery.

This finding is consistent with the study of Ghavifekr and Rosdy (2022), who reported that teaching experience significantly enhances educators' confidence and competence in integrating digital tools into classroom instruction. Similarly, Voogt, Knezek, Cox, Knezek, and Brummelhuis (2023) emphasized that professional development and academic advancement are strongly associated with improved digital competence among higher education lecturers. Their findings support the view that continuous exposure to teaching responsibilities and institutional ICT training contributes to stronger digital literacy skills. In addition, the result aligns with the work of Lawless and Pellegrino (2021), who found that age and professional experience influence educators' adaptability to emerging technologies, particularly in environments undergoing rapid digital transformation. Likewise, Ertmer and Ottenbreit-Leftwich (2022) observed that academic qualification and institutional position often determine access to professional learning opportunities, which in turn enhances digital literacy development. However, contrasting evidence was reported by Siddiq, Scherer, and Tondeur (2021), who found that demographic characteristics alone may not fully explain variations in digital literacy, as factors such as institutional support, access to infrastructure, and personal motivation also play critical roles. This suggests that while demographic variables are important predictors, they may interact with contextual and environmental factors in shaping digital literacy outcomes. Generally, the findings of this study indicate that demographic characteristics significantly influence the digital literacy of Computer Science lecturers in their use of Microsoft Teams. The observed variation reflects the combined effects of individual background factors and professional exposure, highlighting the importance of continuous capacity building and institutional support to strengthen lecturers' digital competencies in higher education settings.

Application of Microsoft Teams: The result of the standard multiple regression analysis (Enter method) revealed that demographic characteristics significantly influence the application of Microsoft Teams for instructional delivery among Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria. The ANOVA result confirmed that the regression model was statistically significant ($p < 0.05$), indicating that age, gender, academic qualification, teaching experience, and professional rank jointly predict variations in lecturers' application of Microsoft Teams in instructional activities. This implies that demographic background plays a meaningful role in shaping how lecturers integrate the platform into teaching and learning processes. The coefficients further showed that all demographic variables contributed significantly to the model, though with different levels of influence. Teaching experience emerged as the strongest predictor of application, followed by professional rank, age, academic qualification, and gender. This suggests that lecturers with longer years of teaching experience and higher academic or professional status are more likely to effectively apply Microsoft Teams in instructional delivery, while demographic differences account for variations in depth and frequency of use.

This finding is supported by Nigerian-based studies. For instance, Olatunji and Adebayo (2022) reported that lecturers' teaching experience and institutional rank significantly influence their adoption and classroom integration of digital learning tools in Nigerian universities. Similarly, Nwankwo and Ezeani (2021) found that academic qualification and years of exposure to ICT training strongly predict lecturers' ability to effectively apply digital platforms in teaching activities. Their



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findings emphasize that professional maturity enhances confidence and competence in technology integration. In addition, Okoro, Obi, and Eze (2023) observed that demographic factors such as age and teaching experience significantly influence lecturers' classroom use of learning management systems and collaboration tools in Nigerian higher education institutions. They explained that more experienced lecturers tend to have greater exposure to institutional ICT initiatives, which enhances their application of digital tools in instructional delivery. Likewise, Ibrahim and Yusuf (2020) highlighted that gender differences, though less influential, may still reflect disparities in access, confidence, and prior ICT exposure among academic staff in some Nigerian institutions. However, contrasting evidence was reported by Adedeji and Ajayi (2021), who found that institutional factors such as infrastructure, training opportunities, and technical support are often stronger determinants of technology application than demographic characteristics alone. This suggests that while demographic variables are important, they interact with institutional conditions in shaping lecturers' effective use of digital platforms. Generally, the findings indicate that demographic characteristics significantly influence the application of Microsoft Teams among Computer Science lecturers in Federal tertiary institutions in Kaduna State. The observed differences reflect variations in professional exposure, academic attainment, and teaching experience, highlighting the need for continuous ICT capacity building and improved institutional support to enhance effective integration of digital tools in instructional delivery.

Conclusion

Based on the findings from the study concludes that demographic characteristics significantly influence both digital literacy and the application of Microsoft Teams among Computer Science lecturers in Federal tertiary institutions in Kaduna State, Nigeria. The model results indicate that variables such as age, gender, academic qualification, teaching experience, and professional rank collectively play a meaningful role in shaping lecturers' competence and engagement with Microsoft Teams for instructional delivery.

The findings further reveal that Computer Science lecturers generally demonstrate a relatively high level of digital literacy in the use of Microsoft Teams, as indicated by positive model estimates and significant predictor effects. This suggests that lecturers are largely familiar with the platform and possess the basic competencies required for its instructional use. Conversely, the application of Microsoft Teams for instructional delivery is moderate, although statistically significant in relation to demographic characteristics. This implies that while lecturers possess the necessary digital skills, the extent of actual application varies across demographic groups and may be influenced by factors such as experience, professional rank, and institutional exposure. It also suggests that effective utilization is not uniform, and some lecturers may still face constraints in fully integrating the platform into teaching activities.

Recommendations

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

1. Federal tertiary institutions in Kaduna State should strengthen continuous professional development programmes focused on digital literacy for Computer Science lecturers. Regular training workshops, hands-on ICT sessions, and institutional capacity-building initiatives should be organized to ensure that lecturers maintain and improve their competence in using Microsoft Teams and other emerging digital learning platforms. In addition, institutions should provide structured mentorship and peer-support systems to help less digitally experienced lecturers enhance their skills and confidence in instructional technology use.



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2. Institutions should develop clear policies and provide adequate ICT infrastructure to promote the full integration and consistent application of Microsoft Teams in instructional delivery. This includes ensuring reliable internet connectivity, access to functional digital devices, and institutional subscriptions to Microsoft Teams across all departments. Furthermore, lecturers should be encouraged and supported to expand their use of the platform beyond basic communication functions to include assessment, student engagement, collaboration, and feedback processes, thereby maximizing its instructional benefits.

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