

Predictors of Teaching Effectiveness among Academic Staff in Higher Education Institutions in Gusau, Zamfara State, Nigeria: The Roles of Digital Readiness and Institutional Support

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Abstract- Teaching effectiveness is central to the quality of higher education, while increasing reliance on digital technologies has made academic staff's digital readiness and institutional support important considerations in instructional practice. This study examined digital readiness and institutional support as predictors of teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State, Nigeria. A cross-sectional quantitative research design was adopted. The population comprised 954 academic staff across five higher education institutions in Gusau, from which a sample of 282 academic staff was selected using the Taro Yamane formula and proportionate sampling. Data were collected using a structured questionnaire measuring digital readiness, institutional support, and teaching effectiveness. Expert review was used to establish content validity, while a pilot study was conducted to assess the instrument's clarity and reliability. The questionnaire demonstrated good internal consistency, with an overall Cronbach's alpha coefficient of 0.83. Data were analysed using descriptive statistics, Pearson's product-moment correlation, and multiple linear regression at the 0.05 significance level. The findings revealed a significant positive relationship between digital readiness and teaching effectiveness ($r = .286, p = .012$). Institutional support also demonstrated a significant positive relationship with teaching effectiveness ($r = .151, p = .041$). Furthermore, digital readiness and institutional support jointly significantly predicted teaching effectiveness, $F(2, 279) = 14.38, p < .001$, explaining 9.5% of the variance. Digital readiness made the stronger unique contribution ($\beta = .243, p = .001$), compared with institutional support ($\beta = .147, p = .027$). The study concludes that strengthening academic staff's digital capabilities alongside institutional support may enhance teaching effectiveness in higher education.

Keywords - Teaching Effectiveness, Digital Readiness, Institutional Support, Academic Staff, Higher Education Institutions.

I. INTRODUCTION

Teaching effectiveness is fundamental to the quality of higher education because academic staff are responsible for facilitating students' learning, engagement, and academic development. Effective teaching requires more than disciplinary knowledge; it involves appropriate instructional planning and delivery, classroom interaction, student engagement, assessment, feedback, and the ability to respond to diverse learning needs (Darling-Hammond et al., 2020; OECD, 2019). In higher education, effective teaching is also associated with lecturers' ability to create supportive learning environments and employ appropriate instructional strategies that promote meaningful student learning (Kember & Leung, 2006). In Nigeria, these demands have increasingly included the use of digital technologies and technology-supported approaches to teaching and learning, requiring academic staff to develop capabilities that extend beyond traditional classroom practices (Afolabi & Segun, 2021; Nwagwu, 2020).

One factor that may influence teaching effectiveness is digital readiness, which refers to academic staff's preparedness, confidence, and capability to use digital technologies for instructional purposes. Digital readiness encompasses not only access to technology but also the knowledge, skills, confidence, and willingness required to integrate

digital technologies into teaching and learning activities (van Laar et al., 2017; Redecker, 2017). This includes the ability to use digital resources, communication platforms, online learning environments, and technology-supported assessment. Evidence from higher education indicates that lecturers' readiness to adopt digital teaching is influenced by their technological capabilities as well as their perceptions of institutional preparedness and available support (Nwagwu, 2020). Nwagwu (2020) found that ICT equipment, training, e-learning content, and institutional readiness were important considerations in lecturers' perceptions of e-learning preparedness. Similarly, Ogbodoakum et al. (2022) reported that lecturers' self-efficacy, management support, online content readiness, and perceived benefits significantly influenced their readiness to adopt online learning in Nigerian higher education institutions.

However, individual digital readiness may not translate into effective teaching where institutional conditions are inadequate. Institutional support encompasses the resources and organizational conditions provided to academic staff, including ICT infrastructure, teaching materials, technical assistance, professional development, and administrative support. Previous research has shown that organizational support can influence employees' ability to perform their roles effectively by providing the resources and conditions necessary for successful task performance (Eisenberger et al., 1986; Kurtessis et al., 2017). In higher education, institutional support is particularly important because lecturers require adequate infrastructure, professional development opportunities, instructional resources, and administrative assistance to respond effectively to changing teaching demands (Nwagwu, 2020). Evidence from Nigerian universities further suggests that institutional support is relevant to faculty effectiveness. Falola et al. (2020), for example, found that institutional support strategies were associated with faculty job effectiveness in selected Nigerian public universities. This suggests that academic staff require not only individual capabilities but also an enabling institutional environment to perform their teaching responsibilities effectively.

The relationship between individual capabilities, institutional conditions, and teaching behaviour can be explained through Social Cognitive Theory, which proposes that human behaviour results from reciprocal interactions among personal factors, behaviour, and environmental influences (Bandura, 1986). The theory recognizes that individuals' capabilities and beliefs influence their behaviour while environmental conditions can facilitate or constrain the expression of those capabilities (Bandura, 1986). In the present study, digital readiness represents an individual capability, institutional support represents an environmental condition, and teaching effectiveness represents the behavioural outcome. The framework therefore provides a basis for examining whether academic staff's digital preparedness and the institutional environment jointly contribute to effective teaching.

The growing integration of digital technologies into higher education has consequently increased the importance of lecturers' digital competencies and institutional preparedness. Digital technologies can support access to learning resources, communication, collaboration, assessment, and flexible modes of instructional delivery when they are appropriately integrated into teaching practice (Redecker, 2017; UNESCO, 2023). However, the availability of technology alone does not guarantee effective educational use, as successful integration also depends on educators' competence, confidence, pedagogical application, and the support provided by their institutions (Tondeur et al., 2017; Nwagwu, 2020).

Although Nigerian studies have examined lecturers' readiness for e-learning, institutional support, and technology adoption, there is limited evidence examining digital readiness and institutional support simultaneously as predictors of teaching effectiveness. Moreover, available evidence is largely drawn from broader university or national contexts, with limited empirical attention to academic staff in higher education institutions in Gusau, Zamfara State. The local institutional context may differ in terms of technological resources, staff development opportunities, and organizational support, making context-specific evidence necessary.

Against this background, this study therefore examines the relationships between digital readiness, institutional support, and teaching effectiveness and determines the extent to which digital readiness and institutional support jointly predict teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State, Nigeria.

Research Questions

The study was guided by the following research questions:

- i. What significant relationship exists between digital readiness and teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State, Nigeria?
- ii. What significant relationship exists between institutional support and teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State, Nigeria?
- iii. To what extent do digital readiness and institutional support jointly predict teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State, Nigeria?

Hypotheses

The following null hypotheses were tested:

H₀₁: Digital readiness has no significant relationship with teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State, Nigeria.

H₀₂: Institutional support has no significant relationship with teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State, Nigeria.

H₀₃: Digital readiness and institutional support do not significantly predict teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State, Nigeria.

Methodology

The study employed a cross-sectional quantitative research design to examine the relationships between digital readiness, institutional support, and teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State, Nigeria. The study population comprised academic

staff in five higher education institutions in Gusau: Federal University, Gusau (FUGUS), Federal College of Education (Technical), Gusau, Zamfara College of Arts and Science (ZACAS), Huda University, Gusau, and College of Nursing and Midwifery, Gusau. The total population comprised 954 academic staff, distributed as follows: 315 from FUGUS, 220 from Federal College of Education (Technical), 234 from ZACAS, 72 from Huda University, and 113 from the College of Nursing and Midwifery.

The sample size was determined using the Taro Yamane (1967) formula:

$$n = \frac{N}{1 + N(\ell)^2}$$

Where n represents the required sample size, N represents the population size, and ℓ represents the level of precision. With a total population of 954 academic staff and a 5% level of precision, the sample size was calculated as:

$$n = \frac{954}{1 + 954(0.05)^2} = \frac{954}{1 + 2.385} = \frac{954}{3.385} = 281.83$$

The resulting value was rounded to 282 academic staff, which constituted the sample size for the study. Proportional sampling was subsequently used to distribute the sample across the five institutions according to their respective academic-staff populations. The proportional allocation was determined using:

$$n_i = \frac{N_i}{N} \times n$$

where n_i represents the sample allocated to institution i , N_i represents the academic-staff population of institution i , N represents the total population of 954, and n represents the total sample size of 282. The resulting distribution was 93 respondents from FUGUS, 65 from Federal College of Education (Technical), 69 from ZACAS, 21 from Huda University, and 34 from the College of Nursing and Midwifery, giving a total of 282 respondents.

Data were collected using a structured questionnaire comprising measures of digital readiness, institutional support, and teaching effectiveness. The measurement items were adapted from established

instruments reported in relevant empirical literature and modified where necessary to reflect the context of higher education institutions in Nigeria. Digital readiness was operationalized in terms of academic staff's digital skills, confidence and preparedness, and ability to use digital technologies for teaching and related academic activities. Institutional support was measured through items covering ICT facilities, technical support, teaching resources, professional development opportunities, and administrative or institutional support. Teaching effectiveness, the dependent variable, was measured as a multidimensional construct covering instructional organization, instructional delivery, student engagement, and assessment and feedback. The items were measured using a five-point Likert scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), with higher scores indicating higher levels of the respective constructs.

The questionnaire was subjected to expert review to establish content validity and ensure that the items adequately represented the constructs under investigation. A pilot study was conducted among academic staff who were not included in the main study to assess the clarity, suitability, and preliminary reliability of the instrument. The internal consistency of the scales was assessed using Cronbach's alpha, which yielded an overall reliability coefficient of 0.83, indicating a good level of internal consistency and demonstrating that the instrument was sufficiently reliable for the main study.

The data collection process was conducted after obtaining the necessary institutional permissions and ethical approval. Respondents were informed about the purpose of the study, and participation was voluntary. Confidentiality and anonymity were maintained throughout the data collection process, and the information obtained was used solely for research purposes.

The collected data were analyzed using descriptive and inferential statistical techniques. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the characteristics of the respondents and the study variables. Preliminary diagnostic analyses were

conducted to examine missing data, outliers, normality, and multicollinearity. Pearson's product-moment correlation was used to examine the relationships between digital readiness, institutional support, and teaching effectiveness. Multiple linear regression analysis was subsequently employed to determine the joint predictive contribution of digital readiness and institutional support to teaching effectiveness.

The regression model was specified as:

$$TE_i = \beta_0 + \beta_1 DR_i + \beta_2 IS_i + \varepsilon_i$$

where TE_i represents teaching effectiveness, DR_i represents digital readiness, IS_i represents institutional support, β_0 represents the regression intercept, β_1 and β_2 represent the regression coefficients for digital readiness and institutional support, respectively, and ε_i represents the random error term. The regression results were evaluated using R^2 , adjusted R^2 , standardized beta coefficients, 95% confidence intervals, F-statistic, t-statistics, and p-values. The hypotheses were tested at the 0.05 level of significance.

Result of Data Analysis

The results are presented according to the three research questions and corresponding hypotheses. Pearson's product-moment correlation was used to examine the relationships between digital readiness, institutional support, and teaching effectiveness, while multiple linear regression was used to determine the joint predictive effect of digital readiness and institutional support on teaching effectiveness. All hypotheses were tested at the 0.05 level of significance.

Research Question 1: What significant relationship exists between digital readiness and teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State, Nigeria?

Table 1. Relationship between Digital Readiness and Teaching Effectiveness

Variables	N	Mean	SD	r	p
Digital Readiness	282	3.38	0.61	0.286	.012
Teaching Effectiveness	282	3.57	0.55		

The result indicates a positive but weak relationship between digital readiness and teaching effectiveness ($r=.286$, $P=.012$). Although the relationship is statistically significant at the 0.05 level, its relatively small magnitude suggests that digital readiness alone is not a strong determinant of teaching effectiveness. H_{01} : Digital readiness has no significant relationship with teaching effectiveness among academic staff. Since $p=.012<.05$, H_{01} was rejected.

Research Question 2: What significant relationship exists between institutional support and teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State, Nigeria?

Table 2. Relationship between Institutional Support and Teaching Effectiveness

Variables	N	Mean	SD	r	p
Institutional Support	282	3.11	0.69	0.151	.041
Teaching Effectiveness	282	3.57	0.55		

The result shows a weak positive relationship between institutional support and teaching effectiveness ($r=.151$, $p=.041$). Although statistically significant, the magnitude of the association is small, indicating that institutional support has only a limited bivariate association with teaching effectiveness.

H_{02} : Institutional support has no significant relationship with teaching effectiveness among academic staff.

Since $p=.041<.05$, H_{02} was rejected.

Research Question 3: To what extent do digital readiness and institutional support jointly predict teaching effectiveness among academic staff in

higher education institutions in Gusau, Zamfara State, Nigeria?

Multiple linear regression was conducted to determine whether digital readiness and institutional support jointly predicted teaching effectiveness.

Table 3. Model Summary

R	R ²	Adjusted R ²	Std. Error of Estimate
.309	.095	.089	.528

The model produced an R^2 of .095, indicating that digital readiness and institutional support jointly explained 9.5% of the variance in teaching effectiveness. The adjusted R^2 was .089, indicating that approximately 8.9% of the variance remained explained after adjustment for the number of predictors.

Table 4. ANOVA for the Regression Model

Model	SS	df	MS	F	p
Regression	8.02	2	4.01	14.38	<.001
Residual	77.84	279	.279		
Total	85.86	281			

The regression model was statistically significant, $F(2,279)=14.38$, $p=<.001$. Thus, digital readiness and institutional support jointly contributed significantly to the prediction of teaching effectiveness. However, the relatively low R^2 indicates that their explanatory contribution was modest.

Table 5. Regression Coefficients

Predictor	B	SE	β	t	p	95% CI
Constant	2.836	.201	—	14.11	<.001	[2.440, 3.232]
Digital Readiness	.219	.061	.243	3.593	.001	[.099, .339]
Institutional Support	.118	.053	.147	2.237	.027	[.014, .222]

The results indicate that both predictors made statistically significant positive contributions to teaching effectiveness. Digital readiness had a standardized coefficient of $\beta = .243$, while institutional support had a smaller standardized coefficient of $\beta = .147$. Thus, digital readiness made the stronger unique contribution to the prediction of teaching effectiveness.

The estimated regression equation was:

$$TE = 2.836 + 0.219DR + 0.118IS$$

H₀₃: Digital readiness and institutional support do not significantly predict teaching effectiveness among academic staff.

Since the overall regression model was statistically significant ($F(2,279) = 14.38, p = .003$), H₀₃ was rejected.

Table 6: Summary of Hypothesis Testing

Hypothesis	Statistical Result	Decision
H ₀₁	$r = .286, p = .012$	Rejected
H ₀₂	$r = .151, p = .041$	Rejected
H ₀₃	$F(2,279) = 14.38, p = .003$	Rejected

Discussion of Findings

Digital Readiness and Teaching Effectiveness

The first finding revealed a positive and statistically significant relationship between digital readiness and teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State ($r = .286, p = .012$). Although the relationship was weak in magnitude, the result indicates that higher levels of digital readiness were associated with higher levels of teaching effectiveness. This suggests that academic staff who possess greater confidence, preparedness, and capability in using digital technologies may be better positioned to support instructional delivery, student engagement, communication, learning activities, and technology-supported assessment.

The finding is consistent with Nwagwu (2020), who reported that lecturers' readiness for e-learning was associated with factors such as ICT equipment, training, e-learning content, and institutional

readiness. The present finding extends this evidence by demonstrating that digital readiness was significantly associated not only with readiness for e-learning but also with the broader construct of teaching effectiveness. Similarly, Ogbodoakum *et al.* (2022) found that individual and organizational factors, including lecturers' self-efficacy, influenced readiness to accept online learning among higher education lecturers in Nigeria. The positive relationship observed in the present study therefore supports the view that lecturers' technological preparedness and confidence may contribute to more effective teaching practices.

However, the relatively small correlation coefficient ($r = .286$) indicates that digital readiness has only a limited bivariate association with teaching effectiveness. This is understandable because teaching effectiveness is a multidimensional construct involving several aspects of academic practice, including instructional planning, delivery, classroom interaction, student engagement, assessment, and feedback. Consequently, possessing digital skills alone may not necessarily result in highly effective teaching. Rather, digital readiness may complement other pedagogical and professional competencies required for effective teaching. The finding therefore suggests that digital readiness is a relevant but not sufficient factor in explaining variations in teaching effectiveness among academic staff.

Institutional Support and Teaching Effectiveness

The second finding showed that institutional support had a positive and statistically significant relationship with teaching effectiveness ($r = .151, p = .041$). The relationship was weak, indicating that academic staff who reported higher levels of institutional support also tended to report higher levels of teaching effectiveness. The result suggests that access to ICT facilities, instructional resources, technical assistance, professional development, and administrative support may contribute to lecturers' ability to perform their teaching responsibilities effectively.

This finding agrees with Falola *et al.* (2020), who reported a significant relationship between institutional support strategies and faculty job

effectiveness in selected Nigerian public universities. The present study provides additional evidence that the institutional environment is relevant to academic staff effectiveness, particularly teaching effectiveness, within the context of higher education institutions in Gusau, Zamfara State.

The finding also complements Nwagwu (2020), who identified institutional readiness, ICT equipment, training, and e-learning content as important factors in lecturers' perceptions of e-learning preparedness. While Nwagwu's study focused primarily on e-learning readiness, the present study demonstrates that institutional support also has a statistically significant relationship with teaching effectiveness. Nevertheless, the weak magnitude of the association ($r = .151$) indicates that institutional support alone explains only a small part of the variation in teaching effectiveness. This may imply that the availability of institutional resources and support does not automatically result in effective teaching unless academic staff also possess the competencies and confidence required to use available resources effectively.

Joint Predictive Effect of Digital Readiness and Institutional Support

The third finding showed that digital readiness and institutional support jointly significantly predicted teaching effectiveness among academic staff, $F(2, 279) = 14.38$, $p < .001$. The regression model produced an R^2 of .095, indicating that digital readiness and institutional support jointly accounted for 9.5% of the variance in teaching effectiveness. The adjusted R^2 of .089 indicates that approximately 8.9% of the variance was explained after adjusting for the number of predictors in the model.

The statistically significant overall regression model indicates that digital readiness and institutional support, when considered together, provide significant predictive information about teaching effectiveness. However, the relatively modest R^2 value indicates that the two predictors explain only a small proportion of the observed variation in teaching effectiveness. Therefore, although digital readiness and institutional support are statistically significant predictors, they should not be regarded as the

principal determinants of teaching effectiveness. Other factors not included in the present model are likely to account for a substantial proportion of the remaining variation.

The individual regression coefficients further showed that digital readiness made a statistically significant positive contribution to teaching effectiveness ($B = .219$, $\beta = .243$, $p = .001$). Institutional support also made a statistically significant positive contribution ($B = .118$, $\beta = .147$, $p = .027$). The standardized coefficients indicate that digital readiness made the stronger unique contribution to the prediction of teaching effectiveness compared with institutional support. Specifically, a one-standard-deviation increase in digital readiness was associated with a .243 standard-deviation increase in teaching effectiveness, holding institutional support constant. Similarly, a one-standard-deviation increase in institutional support was associated with a .147 standard-deviation increase in teaching effectiveness, holding digital readiness constant.

The stronger contribution of digital readiness is consistent with Ogbodoakum *et al.* (2022), who identified individual factors, particularly lecturers' self-efficacy, as important in explaining readiness to accept online learning. It also complements Nwagwu (2020), who emphasized the relevance of lecturers' technological capabilities alongside institutional preparedness. The present findings therefore suggest that the capabilities possessed by academic staff may have a relatively greater predictive contribution to teaching effectiveness than institutional support when both factors are considered simultaneously.

At the same time, the significant contribution of institutional support demonstrates that the organizational environment remains relevant. This finding is consistent with Falola *et al.* (2020), who established a relationship between institutional support strategies and faculty effectiveness. The results therefore indicate that both individual and institutional factors should be considered when examining teaching effectiveness among academic staff.

The findings can also be interpreted within the framework of Social Cognitive Theory (Bandura, 1986), which emphasizes the influence of personal factors and environmental conditions on human behaviour. In the present study, digital readiness represents an individual capability, whereas institutional support represents an environmental condition. The significant contributions of both variables to teaching effectiveness are consistent with the theoretical proposition that individual capabilities and environmental conditions can jointly be relevant to behavioural outcomes. However, the present study did not directly test reciprocal interactions among these components; therefore, the findings should be interpreted as providing empirical support for the relevance of personal and environmental factors rather than demonstrating reciprocal causation.

The relatively low explanatory power of the model is also important. The R^2 of .095 means that 9.5% of the variance in teaching effectiveness was not explained by digital readiness and institutional support in the present model. This does not imply that the predictors are unimportant; rather, it indicates that teaching effectiveness is a complex outcome that is likely influenced by several additional factors. Such factors may include pedagogical competence, teaching experience, workload, motivation, leadership, class size, professional development, institutional culture, availability of instructional materials, and student-related characteristics. Future studies could therefore incorporate additional variables to develop a more comprehensive model of teaching effectiveness in higher education.

Overall, the findings demonstrate that digital readiness and institutional support are statistically significant but relatively modest predictors of teaching effectiveness. Digital readiness demonstrated both the stronger bivariate relationship and the stronger unique predictive contribution, while institutional support also made a significant but smaller contribution. These findings highlight the importance of developing academic staff's digital capabilities while simultaneously creating institutional conditions that enable those capabilities to be applied effectively in teaching practice.

CONCLUSION

The study concludes that digital readiness and institutional support are significant factors associated with teaching effectiveness among academic staff in higher education institutions in Gusau, Zamfara State. Digital readiness demonstrated a stronger relationship with teaching effectiveness than institutional support and also made the greater unique contribution in the regression model. Institutional support, although weaker, remained a statistically significant predictor.

The joint significance of the regression model further demonstrates that academic staff's individual technological preparedness and the institutional environment in which they operate both matter for effective teaching. However, because the two predictors explained only 9.5% of the variance in teaching effectiveness, the study concludes that other factors beyond digital readiness and institutional support are likely to play substantial roles in determining teaching effectiveness.

RECOMMENDATIONS

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

- i. The management of higher education institutions in Gusau, Zamfara State should regularly organize practical digital skills training and professional development programmes for academic staff to improve their competence, confidence, and preparedness in using digital technologies for instructional delivery, assessment, communication, and student engagement.
- ii. The management of higher education institutions in Gusau, Zamfara State should provide and maintain adequate ICT infrastructure, reliable internet connectivity, digital learning platforms, and appropriate technology-supported instructional resources to enable academic staff to effectively apply their digital competencies in teaching.
- iii. The management of higher education institutions in Gusau, Zamfara State should establish accessible and responsive technical support

services to assist academic staff in addressing technology-related challenges and effectively integrating digital technologies into their teaching activities.

- iv. The management of higher education institutions in Gusau, Zamfara State should integrate digital skills training with adequate institutional support by ensuring that academic staff who receive digital training are provided with the facilities, technical assistance, teaching resources, and administrative support required to apply the acquired competencies effectively.
- v. Future researchers should examine additional personal, pedagogical, and institutional factors, such as teaching experience, pedagogical competence, workload, motivation, leadership, class size, and availability of instructional resources, because digital readiness and institutional support jointly explained only 9.5% of the variance in teaching effectiveness.

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