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Al-Hikmah Journal of Education (AJE)
Volume 13 Number 1 June, 2026
e-ISSN: 2705-2508; p-ISSN: 2384-7662

DEMOGRAPHIC INVARIANCE AND INFRASTRUCTURE DEFICITS IN SMART CLASSROOM INTEGRATION: EVIDENCE FROM ARMED FORCES SECONDARY SCHOOLS IN NORTH-CENTRAL NIGERIA

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Abstract
In educational policies, teachers' qualifications and experience in teaching affect teachers' use of technology in the classroom. However, there is limited evidence of such demographic factors and infrastructural constraints in specialised education systems. The study looked into the predictive power of teachers' educational qualifications and teaching experience in the deployment of Smart Classroom technology in Armed Forces Secondary Schools (AFSS), North-Central Nigeria, with the availability of infrastructure. The study design was a correlational survey, which was done according to the theory of Diffusion of Innovation that was developed by Rogers. All 557 teachers of 15 schools were targeted and seven schools were purposively selected. The members of the sample were of the total number of teachers (364). A validated questionnaire (QMSBISCI) was used to collect the data, and the Cronbach alpha coefficient for availability and integration were found to be .86 and .89, respectively. Descriptive statistics and multiple linear regression were used to analyse the data at 5% level of significance. These findings showed that the educational qualification (β = -.060, p = .206) and teaching experience (β = -.045, p = .344) were not significant factors in explaining the smart classroom integration. The overall regression model was also non-significant (R^2 = .0055, F(2,361) = 0.997, p = .370). Availability of infrastructure (M = 2.06, SD = 1.09) and in particular scheduled access (M = 1.76) and technical support (M = 1.89) were assessed as low, as were interactive smartboards (M = 1.90). The study indicates the possibility of a 'infrastructure wall' that weakens the impact of teachers' demographic characteristics on technology use when there is an infrastructural gap. It recommends equitable distribution of the hardware, solar power for backup, provision of specific technical support and a properly arranged access to the class timetables across Armed Forces Secondary Schools (AFSS).

Keywords: Educational qualification, Teaching experience, Smart Classroom integration, Infrastructure deficits, Diffusion of Innovation, Armed Forces Secondary Schools, Demographic invariance.

Introduction

Contemporary educational technology policies in developing nations frequently rest upon the assumption that teacher human capital, specifically formal academic qualifications and classroom teaching longevity, serves as the primary catalyst for pedagogical innovation and digital technology uptake (Abdulraheem et al., 2025; Ronfeldt, 2021). In Nigeria, educators are systematically encouraged to pursue advanced postgraduate degrees (B.Ed., M.Ed., Ph.D.) under the premise that higher qualifications enhance technological pedagogical content knowledge, digital self-efficacy, and instructional adaptability (Anyaobi & Echedom, 2025; Ngozi, 2021).

Parallel to academic credentials, years of teaching experience are widely regarded as a fundamental repository of classroom management expertise and instructional judgment (Hobbiss et al., 2020). However, empirical literature regarding how teaching experience and advanced credentials directly influence the rate

of Smart Classroom integration remains contradictory (Anggraini et al., 2024; Muhinat, 2022). While some scholars contend that veteran educators establish instructional routines that are resilient during technological disruptions (Ademola et al., 2021), others argue that highly credentialed teachers possess greater cognitive flexibility to master complex digital tools (Eke, 2024).

Crucially, educational technology integration does not occur in an institutional vacuum. In Armed Forces Secondary Schools across North-Central Nigeria, educators operate within military administrative structures characterized by centralized governance and strict organizational protocols (Bekesiene & Vasiliauskas, 2025). While these institutions benefit from structured management, they simultaneously face acute systemic limitations in accessing, maintaining, and operating Smart Classroom infrastructure (Ezeobi, 2026). Where essential physical resources, such as interactive smartboards, reliable high-speed internet connectivity, operational power backup systems, and dedicated technical support personnel are severely deficient, the theoretical pedagogical advantages conferred by teacher qualification and experience may be entirely neutralized.

The deployment and active utilization of Smart Classroom facilities across Armed Forces Secondary Schools in North-Central Nigeria are strikingly uneven (Chukwuemeka et al., 2025). Low technology adoption is frequently attributed to teacher demographic traits; for instance, conventional wisdom suggests that older or long-tenured teachers are reluctant to adopt digital tools, or that under-credentialed teachers lack technical fluency (Femi-Adeoye, 2025). However, focusing exclusively on individual demographic factors overlooks critical systemic bottlenecks within the school environment. Even highly qualified teachers possessing doctoral degrees or extensive instructional tenure cannot integrate Smart Classroom technologies if their schools lack functional smartboards, stable power supply, high-speed internet, or on-site technical assistance (Adejumobi & Aligwo, 2025; Oshowole, 2024). A critical empirical gap exists regarding whether demographic characteristics predict actual Smart Classroom integration when contextualized against self-reported infrastructure availability. This study addresses this gap by quantitatively

examining demographic predictors and providing a comprehensive descriptive evaluation of infrastructure deficits in military secondary schools.

Purpose of the Study, Research Questions, and Hypotheses

The primary objective of this study was to investigate the predictive relationship of educational qualification and teaching experience on the availability of Smart Classroom technologies among teachers in Armed Forces Secondary Schools in North-Central Nigeria. Specifically, the study sought to:

1. Assess the level of availability of Smart Classroom technologies and supporting infrastructure across the schools.
2. Examine whether educational qualification significantly predicts Smart Classroom integration.
3. Determine whether years of teaching experience significantly predicts Smart Classroom integration.

Research Question

To align fully with these research objectives, four specific research questions were formulated:

1. What is the level of availability of Smart Classroom technologies in Armed Forces Secondary Schools in North-Central Nigeria?

Hypotheses

The following null hypotheses were formulated and tested at the .05 level of significance:

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e-ISSN: 2705-2508; p-ISSN: 2384-7662

H_o1: Teachers' educational qualification does not significantly predict Smart Classroom integration among teachers in Armed Forces Secondary Schools in North-Central Nigeria.
H_o2: Teachers' years of teaching experience do not significantly predict Smart Classroom integration among teachers in Armed Forces Secondary Schools in North-Central Nigeria.

Theoretical Framework: Diffusion of Innovation (DOI) Theory

This study is anchored in Everett Rogers' (1962, 2003) Diffusion of Innovation (DOI) Theory. DOI Theory provides a robust theoretical framework for explaining, describing, and predicting how technological innovations spread through a social system over time (Acikgoz et al., 2023; Wang et al., 2023). Rogers posited four essential structural elements that govern innovation diffusion: the innovation itself, communication channels, time, and the social system context (Mbatha, 2024).

Within DOI Theory, prospective adopters are categorized along an adoption curve based on individual innovativeness: Innovators (2.5%), Early Adopters (13.5%), Early Majority (34%), Late Majority (34%), and Laggards (16%) (Kasneci et al., 2023). In educational research, teacher attributes such as academic qualification and teaching tenure are frequently conceptualized as adopter characteristics determining an individual's position on this adoption spectrum (Menzli et al., 2022). However, DOI Theory explicitly emphasizes that individual adopter innovativeness cannot materialize in isolation; it is bounded by systemic facilitating conditions, resource access, and trialability within the social system (Al-Adwan et al., 2024; Badshah et al., 2023).

In the context of this study, DOI Theory facilitates a comparative synthesis between individual adopter attributes (qualification and experience) and contextual social system factors (perceived infrastructure availability). When the social system fails to provide foundational physical infrastructure, reliable power, and equipment trialability, the adoption process stalls regardless of individual adopter credentials. In this manuscript, this phenomenon is conceptualized theoretically as the 'infrastructure wall'—a framework illustrating how severe environmental deficits impose an upper boundary that suppresses the predictive influence of individual demographic capital.

Methodology

The study was descriptive survey research design of the correlational (predictive) type to evaluate the availability of the self-reported Smart Classroom infrastructure and predictive influence of teachers' educational qualifications and teaching experience on technology integration. A total of 557 teachers in 15 Armed Forces Secondary Schools (AFSS) in the North-Central region of Nigeria were targeted. The sampling was done using a multistage sampling technique, with seven schools randomly selected, each representing one of the four States (Plateau, Nasarawa, Niger and Federal Capital Territory) where the Smart Classroom was installed and where it was made administrative accessible. Then, a total enumeration technique was employed and all 364 teachers in the accessible population were selected. Data were gathered by researcher adapted questionnaire named as Questionnaire on Demographic Indicators, Smart Classroom Infrastructure Availability, and Technology Integration (QMSBISCI). The instrument consisted of three parts related to demographic characteristics, availability of infrastructure and integration of Smart Classroom. Educational qualifications and teaching experience were ordinally categorized and used as continuous proxy variables for regression analysis. Infrastructure availability and technology integration were assessed with 10-item scales each, rated on 4-point scales, and with a benchmark mean of 2.50 for

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e-ISSN: 2705-2508; p-ISSN: 2384-7662

infrastructure availability. This measure of availability was based on teacher self-report, not on facility audits.

The content and construct validity of the instrument have been determined by three university professors namely Educational Technology and Measurement. In a pilot study with 30 teachers from non-selected military schools, the Cronbach's alpha coefficients were .86 for infrastructure availability and .89 for the integration of Smart Classroom and the composite reliability was between .89 and .91. IBM SPSS Statistics Version 26 was used to analyse the data. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to answer Research Questions 1 and 2. The two null hypotheses were tested with multiple linear regression with the Enter method in which the two predictors, i.e., educational qualification and teaching experience, were entered simultaneously at the .05 level of significance.

Results and Findings

Demographic Distribution of Respondents

Table 1

Distribution of Respondents by Highest Educational Qualification.

Qualification Level	Academic Description	Frequency (f)	Percentage (%)
NCE / Diploma	National Certificate in Education / Diploma	23	6.3%
Bachelor's Degree	First Degree (B.Ed. / B.Sc. / B.A.)	192	52.7%
Master's Degree	Postgraduate Degree (M.Ed. / M.Sc.)	120	33.0%
Doctorate Degree	Doctor of Philosophy (Ph.D.)	28	7.7%
Others / Cert.	Professional Teaching Certification	1	0.3%

As presented in Table 1, the workforce is highly qualified: 93.4% of teachers held a bachelor's degree or higher (n = 340), and 40.7% possessed postgraduate qualifications (M.Ed./M.Sc. = 33.0%; Ph.D. = 7.7%). The mean qualification code was 2.43 (SD = 0.74). Table 2 outlines the distribution by years of teaching experience.

Table 2

Distribution of Respondents by Years of Teaching Experience

Experience Category	Career Stage Description	Frequency (f)	Percentage (%)
1 – 5 Years	Early-Career Teachers	133	36.5%
6 – 10 Years	Mid-Career Teachers	140	38.5%
11 – 15 Years	Experienced Teachers	40	11.0%
16 Years & Above	Senior / Veteran Teachers	51	14.0%

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Volume 13 Number 1 June, 2026
e-ISSN: 2705-2508; p-ISSN: 2384-7662

Table 2 reflects a balanced experience distribution: 75.0% of teachers were in early- to mid-career stages (1–10 years), while 25.0% possessed over 10 years of service (mean code = 2.02, SD = 1.02).

Research Question 1: What is the level of availability of Smart Classroom technologies in Armed Forces Secondary Schools in North-Central Nigeria?

Table 3

Descriptive mean and standard deviation scores for Smart Classroom technology availability.

Smart Classroom Infrastructure Facility	Mean ($\bar{x}$)	Std. Dev. (SD)
Interactive smartboards installed and accessible in classrooms	1.90	1.08
Multimedia projectors and projection screens available daily	2.21	1.11
Reliable high-speed internet connectivity accessible for lessons	2.25	1.17
Classroom computer systems and laptops functional for teachers	2.08	1.10
Digital educational software and subject modules installed	2.13	1.10
Audio-visual sound systems integrated into teaching spaces	2.15	1.09
Alternative power backup (solar power / generators) operational	2.03	1.10
Technical support personnel available on-site for setup & troubleshooting	1.89	1.02
Smart Classroom access schedules granting regular teacher time	1.76	1.01
Digital learning repositories and e-libraries accessible to staff	2.19	1.22
Overall Cluster Mean & Standard Deviation	2.06	1.09

Table 3 reveals an overall cluster mean of 2.06 (SD = 1.09), which falls significantly below the established benchmark criterion mean of 2.50. This indicates a severe, self-reported infrastructure deficit across the sampled military secondary schools. While internet access (M = 2.25, SD = 1.17) and multimedia projectors (M = 2.21, SD = 1.11) scored relatively higher, critical operational components scored lowest: structured access schedules (M = 1.76, SD = 1.01), on-site technical support staff (M = 1.89, SD = 1.02), and interactive smartboards (M = 1.90, SD = 1.08).

Hypotheses Testing: Multiple Regression Analysis

To test H_o1 and H_o2, which states:

H_o1: Teachers' educational qualification does not significantly predict Smart Classroom integration among teachers in Armed Forces Secondary Schools in North-Central Nigeria.
H_o2: Teachers' years of teaching experience do not significantly predict Smart Classroom integration among teachers in Armed Forces Secondary Schools in North-Central Nigeria.

A multiple linear regression analysis was conducted with educational qualification and teaching experience entered simultaneously as independent predictors of Smart Table 4 provides the unstandardized and standardised regression coefficients, t-values, significance levels, and unique variance contributions (sr^2) for both predictors.

Table 4

Multiple Linear Regression Analysis of the Predictive Influence of Teachers' Educational Qualification and Teaching Experience on Smart Classroom Integration

Predictor Variable	N	B	SE B	β	t-value	p-value	sr^2 (Unique)
Educational Qualification	364	-0.0637	0.050	-.060	-1.266	.206	.003 (0.3%)
Teaching Experience	364	-0.0350	0.037	-.045	-0.947	.344	.002 (0.2%)

Table 4 presents the multiple linear regression analysis of the predictive influence of teachers' educational qualification and teaching experience on Smart Classroom integration among teachers in Armed Forces Secondary Schools in North-Central Nigeria. The results revealed that educational qualification did not significantly predict Smart Classroom integration (β = -.060, t = -1.266, p = .206), accounting for only 0.3% of the unique variance in Smart Classroom integration. Similarly, teaching experience did not significantly predict Smart Classroom integration (β = -.045, t = -0.947, p = .344), contributing only 0.2% of the unique variance. Since both p-values were greater than the .05 significance level, the null hypotheses (H_o1 and H_o2) were not rejected. This implies that teachers' educational qualifications and years of teaching experience do not independently make significant contributions to predicting Smart Classroom integration in the study area.

Summary of the Findings

1. The availability of Smart Classroom technologies in Armed Forces Secondary Schools was low (M = 2.06, SD = 1.09), indicating significant infrastructural deficits.
2. Educational qualification did not significantly predict Smart Classroom technology integration among teachers (β = -.060, p = .206).
3. Teaching experience did not significantly predict Smart Classroom technology integration among teachers (β = -.045, p = .344).

5. DISCUSSION OF FINDINGS

The findings of this study demonstrate that neither educational qualification nor teaching experience significantly predicts Smart Classroom integration among teachers in Armed Forces Secondary Schools in North-Central Nigeria. This empirical result establishes the concept of 'demographic invariance' in resource-constrained military secondary schools. Regardless of whether an educator holds a Master's degree or a Doctorate, or possesses two decades of classroom experience, the rate of Smart Classroom integration remains uniformly constrained.

Theoretical Synthesis of the 'Infrastructure Wall': Interpreted through Rogers' (1962, 2003) Diffusion of Innovation Theory, these findings illustrate how social system context conditions dictate technology

Volume 13 Number 1 June, 2026
e-ISSN: 2705-2508; p-ISSN: 2384-7662

adoption. While DOI Theory acknowledges that adopter attributes (qualification and tenure) influence innovativeness, it asserts that facilitating conditions are foundational prerequisites. In this study, the severe infrastructure deficit (overall mean = 2.06)—characterised by lack of structured schedules, scarce IT support, and inadequate smartboards creates an 'infrastructure wall'. This infrastructure wall should be understood as a theoretical framing: when environmental facilities fall below operational thresholds, systemic barriers suppress the realisation of teacher human capital, rendering demographic advantages predictive invariant.

These results align with prior findings in developing educational contexts. Oguezue (2025) identified inadequate funding and limited computer access as major impediments neutralising teacher readiness in Nigeria. Similarly, Oladiji et al. (2023) observed that formal qualifications failed to translate into Smartboard proficiency when exposure was lacking. Internationally, Brown (2023) and Prakasha et al. (2025) emphasised that contextual readiness and physical equipment availability outweigh individual educator seniority in determining technology adoption.

CONCLUSION AND RECOMMENDATIONS

This study concludes that teacher demographic characteristics (qualification and experience) exhibit predictive invariance regarding Smart Classroom integration in Armed Forces Secondary Schools in North-Central Nigeria. The inability of teacher credentials to predict integration is driven by severe self-reported infrastructure deficits. Without functional interactive hardware, reliable power, on-site technical support, and scheduled access, investment in teacher qualifications alone cannot achieve successful smart classroom integration.

Recommendations

1. Military Education Directorates (Army, Navy, Air Force) should prioritise equipping all Command and Armed Forces schools with functional interactive smartboards and dedicated teacher laptops.
2. School proprietors should install dedicated solar power backup systems for Smart Classrooms to overcome national grid instability.
3. Military school administrations should employ full-time, on-site IT support personnel to handle setup and troubleshooting.
4. School principals must establish structured access schedules ensuring equitable, weekly Smart Classroom teaching slots for all subjects.
5. In-service training should shift from general academic upgrading to hands-on, practical Smart Board pedagogical workshops.

Limitations and Ethical Considerations

A primary measurement limitation of this study is that infrastructure availability was evaluated through teachers' self-reported survey responses rather than objective physical facility audits. Future studies should incorporate direct observational checklists. Additionally, the cross-sectional correlational design precludes causal inferences. Written research permission was obtained from military school commanding officers and education directors. Informed consent was secured from all 364 participating teachers, and complete participant anonymity and data confidentiality were strictly maintained.

REFERENCES

Abdulraheem, A. J., Bolaji, H. O., Ibrahim, A., Owolarafe, K. I., & Lawal, M. D. (2025). Biology teachers' academic qualifications as a predictor of ICT skill level on pedagogical approaches in North-Central, Nigeria. Journal of Education Technology, 9(2), 344–352. https://doi.org/10.23887/jet.v9i2.98730

Acikgoz, F., Elwalda, A., & De Oliveira, M. J. (2023). Curiosity on cutting-edge technology via theory of planned behavior and diffusion of innovation theory. International Journal of Information Management Data Insights, 3(1), 100152. https://doi.org/10.1016/j.jjimei.2022.100152

Adejumobi, G. O., & Aligwo, V. B. (2025). Digital divide revisited: A comprehensive literature review on the impact of unequal ICT infrastructural quality on student learning outcomes in science education. International Journal of Economics, Finance, Accounting and Management, 1(3), 33–45.

Ademola, I. A., Okebukola, P. A., Oladejo, A. I., & Agbanimu, D. (2022). Teachers' qualifications and teaching experience: Impact on quality assurance in Nigeria secondary education. *ResearchGate*. https://www.researchgate.net/publication/360334796_Teachers'_Qualifications_and_Teaching_Experience_Impact_on_Quality_Assurance_in_Nigeria_Secondary_Education

Akther, R., Hossain, M. M., Kamrozzaman, M., & Manik, M. M. H. (2024). Professional standards and educational leadership: Higher secondary teachers' behavioral intention towards adopting new teaching technologies. *Business Ethics and Leadership*, *8*(3), 184–198. https://doi.org/10.61093/bel.8(3).184-198.2024.

Al-Adwan, A. S., Meet, R. K., Kala, D., Smedley, J., Urbaníková, M., & Al-Rahmi, W. M. (2024). Closing the divide: Exploring higher education teachers' perspectives on educational technology. Information Development, 42(4), 1823–1849. https://doi.org/10.1177/02666669241279181

Anggraini, T., Ahmad, M., & Hanafi, I. (2024). Digital literacy and teaching experience as predictors of pedagogical competence in the digital era. Tarbawi Jurnal Keilmuan Manajemen Pendidikan, 10(2), 295–306. https://doi.org/10.32678/tarbawi.v10i02.10795

Anyaobi, G., & Echedom, A. U. (2025). Educational qualification and experience as correlates to Digital Literacy and Information Access Among Library And Information Science Educators in Universities in South-South Nigeria. *Journal of Applied Information Science & Technology*, *18*(1), 64–80. https://doi.org/10.70118/jaist.202501801.8

Badshah, A., Ghani, A., Daud, A., Jalal, A., Bilal, M., & Crowcroft, J. (2023). Towards smart education through Internet of Things: A survey. ACM Computing Surveys, 56(2), 1–33. https://doi.org/10.1145/3610401

Bekesiene, S., & Vasiliauskas, A. V. (2025). Building adaptive and resilient distance military education systems through data-driven decision-making. Systems, 13(10), 852. https://doi.org/10.3390/systems13100852

Brown, A. M. (2023). Exploring expertise of inner-city high school teachers in integrating technology (Publication No. 15050) [Doctoral dissertation, Walden University]. ScholarWorks.

Cao, L., Rasul, M. S., Omar, M., & Zulnaidi, H. (2025). Modeling English teachers' intention to use ICT: technology acceptance and TPACK. *International Journal of Evaluation and Research in Education (IJERE)*, *14*(3), 2314. https://doi.org/10.11591/ijere.v14i3.30444

Chukwuemeka, E. J., Dominic, S., Akanbi, K. R., & Aregbesola, B. G. (2025, June 26). *Transforming from Traditional to Smart Education in Nigeria: Challenges and Opportunities for Learning*. https://ije.unilorinedu.sch.ng/index.php/ije/article/view/304

Eke, E. O. (2024). Assessment of Nigerian teacher educators' strategies for professional digital competent development. Eduphoria, 2(4), 51–63. https://doi.org/10.59231/eduphoria/230418

Ezeobi, C. (2026, July 29). GOC urges commanders to leave lasting legacy, inaugurates education projects at Command Day Secondary School. ThisDay.

Femi-Adeoye, K. O. (2025). Blending digital literacy and pedagogical innovation: Enhancing teacher competence for transformative ICT-based curriculum delivery. Journal of Global Research in Education and Social Science, 19(3), 84–95. https://doi.org/10.56557/jogress/2025/v19i39394

Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2019). Multivariate data analysis (8th ed.). Cengage Learning.

Hobbiss, M., Sims, S., & Allen, R. (2020). Habit formation limits growth in teacher effectiveness: A review of converging evidence from neuroscience and social science. Review of Education, 9(1), 3–23. https://doi.org/10.1002/rev3.3226

Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Groh, G., & Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. Learning and Individual Differences, 103, 102274. https://doi.org/10.1016/j.lindif.2023.102274

Mbatha, B. (2024). Diffusion of innovations: How adoption of new technology spreads in society. In *Synthesis lectures on information concepts, retrieval, and services* (pp. 1–18). https://doi.org/10.1007/978-3-031-60267-2_1

Menzli, L. J., Smirani, L. K., Boulahia, J. A., & Hadjouni, M. (2022). Investigation of open educational resources adoption in higher education using Rogers' diffusion of innovation theory. Heliyon, 8(7), e09885. https://doi.org/10.1016/j.heliyon.2022.e09885

Muhinat, B. B. (2022). Influence of teachers' years of teaching experience on their teaching approaches in secondary school, Ilorin Metropolis, Kwara State. Forum Ilmu Sosial, 49(1), 1–9. https://doi.org/10.15294/fis.v49i1.31791

Ngozi, O. O. (2021). Teachers Qualification as a Determinant of Students Achievement and Attitude towards the English Language. *Journal of Research in Humanities and Social Science*, *9*(12), 73–81. www.questjournals.org.

Ogegbo, A. A. (2024). ICT integration into the teaching and learning of science: Experiences and perceptions of secondary school teachers. African Perspectives of Research in Teaching and Learning Journal, 8(1), 102–118.

Oguezue, N. K. (2025). Technology integration in upper-basic education in Nigeria. Journal of Science Learning, 8(1), 60–67. https://doi.org/10.17509/jsl.v8i1.71715

Oladiji, A., Oyelade, A., & Iwintolu, R. (2023). Qualification and ICT knowledge as predictors of technical subject teaching competence of teachers in Osun State, Nigeria. KIU Journal of Education, 3(2), 9–20. https://doi.org/10.59568/KJED-2023-3-2-02

Al-Hikmah Journal of Education (AJE)
Volume 13 Number 1 June, 2026
e-ISSN: 2705-2508; p-ISSN: 2384-7662

Oshowole, S. A. (2024). Barriers impacting the integration of classroom technology in primary schools in Lagos, Nigeria (Doctoral dissertation, Saint Leo University).

Prakasha, G. S., Rawat, S., Ashton-Bell, R. L. T., & Lapina, M. (2025). Investigating educators' behavioural intentions towards smart tools in education. CHRIST (Deemed to be University).

Rogers, E. M. (1962). Diffusion of innovations. Free Press.

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

Ronfeldt, M. (2021). Links among teacher preparation, retention, and teaching effectiveness. National Academy of Education.

Tabachnick, B. G., & Fidell, L. S. (2019). Using multivariate statistics (7th ed.). Pearson.