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**EDUCATIONAL TECHNOLOGY ADOPTION AND JOB
PERFORMANCE OF PRIVATE SCHOOL TEACHERS IN KUBWA
AND GWARINPA, ABUJA**

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Abstract

This study examined the effect of educational technology adoption on the job performance of private school teachers in Kubwa and Gwarinpa, Abuja. It assessed technology competency, technology usage frequency, technology access, and institutional support. A descriptive cross-sectional survey was conducted among teachers in selected private nursery, primary, and secondary schools. From a population base of 32,489 teachers and a planned sample of 395, 346 usable questionnaires were analyzed. The instrument used a five-point response scale and demonstrated satisfactory reliability, with Cronbach's alpha coefficients ranging from .761 to .867. Descriptive statistics, Pearson correlations, and multiple regression were computed in SPSS 28. The predictors jointly explained 17.5% of the variance in teacher job performance, $R = .419$, $R^2 = .175$, adjusted $R^2 = .166$, $F(4, 341) = 18.140$, $p = .001$. Technology usage frequency was the strongest positive predictor ($\beta = .433$, $p = .001$). Technology access had a significant negative coefficient after controlling for the other predictors ($\beta = -.217$, $p = .002$). Technology competency ($\beta = .094$, $p = .125$) and institutional support ($\beta = .040$, $p = .558$) were not significant. The findings show that access and skill do not automatically improve performance; productive results depend on consistent, task-relevant use and effective integration. Private schools should embed digital tools in routine instructional work, audit the usability of technology provision, strengthen technical support, and evaluate technology investment against teaching outcomes.

Keywords: educational technology; teacher performance; technology competency; usage frequency; technology access; institutional support; private schools

Introduction

As the world enters the fourth industrial revolution, it's easy to agree that modern education technology is no longer a choice but a must in any education system. In the recent past, schools use to rely solely on technology-enabled infrastructure like classroom infrastructure to enable teaching, learning and management of school information system. However, recent innovation has seen the development of digital based tools, platforms, and system, which have become indispensable components of a modernized and comprehensive educational process (Bond et al., 2018).

Recently, the focus of literature has been shifting away from learning outcomes towards teacher-related outcomes as determinants of effective technology integration, particularly in school-based environments. Among teacher related variables, teacher job performance becomes important outcome measure of the use of EdTech in schools. In particular, teachers play an important role in determining the adoption and integration of digital technology into the teaching process. The ability of a teacher to integrate EdTech successfully depends largely on factors like: level of teacher technology competence, technology use frequency, availability of technology access, and institutional support in schools (Akinbo, 2025; Bamidele et al., 2022; Ogwu et al., 2023; Tzenios, 2020).

The term 'job performance' is used in this study to describe the effectiveness and efficiency with which teachers perform their tasks at school. Job performance refers to such factors as lesson delivery, class management, assessment process, student engagement and motivation, provision of feedback, recording keeping, administrative tasks and the overall contribution to educational goal achievement (Bamidele et al., 2022). Particularly in private schools, due to increased competition and expectations, a high performing teacher becomes more vital and important (Akinbo, 2025).

Despite the growing presence of educational technology in private schools within the study area, there remains limited empirical evidence on how technology competency, usage frequency, access and institutional support influence the job performance of private school teachers in Kubwa and Gwarinpa. Much existing research has focused on student learning outcomes or higher education contexts, leaving a gap in understanding teacher-level performance in basic and secondary private school settings in Nigeria. It is against this background that this study examines the effect of EdTech-related factors, specifically technology competency, usage frequency, access and institutional support, on the job performance of private school teachers in Kubwa and Gwarinpa, Abuja.

The increasing infusion of educational technology (EdTech) in classroom instruction has raised new demands on private school teachers. There is the expectation that in a modern classroom, teachers would utilize digital tools for lesson preparation, delivery, and effective delivery of learning to students; effective communication with the school and students, recording keeping and management of the classroom and the delivery. Education in technology should help improve both efficiency, effectiveness and ultimately teacher job performance. Empirical research however show it is neither linear nor linear (Lu & Song, 2020; Verma, Verma, & Goswami, 2025; Quttainah et al., 2025).

The access to digital technologies doesn't guarantee improvement of the job performance rather technology competence, frequent use of the same by the teacher; and the institution supports a teacher to access the tools of adoption (Boothby, Dufour, & Tang, 2010). Technology contributes to productivity if the users receive adequate guidance from an educator or instructor (Boothby, Dufour, & Tang, 2010, p. 21). Without teacher tech competence and appropriate support then there can't be any form of innovation, efficiency and effective delivery that leads to teacher job performance increase (Ogwu et al., 2023; Sabiteka et al., 2025; Fakhri & Sridhar, 2025).

The study's general objective was to examine the effect of educational technology adoption on private school teachers' job performance in Kubwa and Gwarinpa. Specifically, it assessed the effects of technology competency, technology usage frequency, technology access, and institutional support. Four null hypotheses stated that each dimension had no significant effect on job performance.

The evidence is relevant to school owners deciding how to allocate technology budgets, administrators responsible for teacher training and digital policy, teachers seeking practical support, and policymakers promoting digital education. The study covered teachers in selected private primary and secondary schools in Kubwa and Gwarinpa and measured performance through lesson delivery, classroom management, student engagement, assessment and feedback, record keeping, communication, and work productivity.

Literature Review

2.1 Conceptual Review

Educational technology and adoption

Educational technology, generally referred to as EdTech, is the systematic deployment of digital tools, platforms, apps and technical resources to improve teaching, learning, assessment and educational administration. It involves the use of technology to assist instructional delivery, boost access to learning resources, improve teacher-student engagement and promote more successful educational results. Educational technology, according to Bond et al. (2018) is the systematic and systematic design and implementation of digital tools and resources in education to increase learning outcomes and to improve students' learning processes. Here there are the deliberate and planned implementation and use of technology for learning and instruction. Dhwani (2020) conceptualized EdTech as Technology-facilitated learning systems are systems of educational technology which support flexibility, access and the continuity of learning, particularly in disruptions of regular education caused by health crises (like pandemics, schools' shutdowns, or any other circumstances influencing the physical class space).

EdTech adoption refers to the acceptance, use and integration of educational technology tools into teaching, learning and school-related duties. It goes beyond mere availability of digital tools. A teacher may have access to a smartphone, computer, school portal or online platform but may not completely adopt EdTech if those resources are not consistently used for professional teaching activities. Adoption consequently involves actual use, frequency of use, confidence in use and the ability to integrate technology into work routines.

Technology competency

Technology competency refers to the knowledge, skills and confidence that teachers possess in using digital technologies for instructional and administrative purposes. It indicates the level of one's ability to use and operate technology, manipulate computers, produce digital learning resources, manage a virtual classroom and use technology applications in instruction (Ogwu et al., 2023; Liang et al., 2024; Sabiteka et al., 2025).

Technology usage frequency

It means how frequently the teachers use digital devices and tools for teaching and work-related activities. The concept relates to how often teachers apply e-learning platforms, mobile apps, digital instructional materials, virtual classroom, digital assessment systems for their teaching tasks (Ogwu et al., 2023; Sabiteka et al., 2025). It is important for the frequency of use, as it increases familiarity with technology, reduce resistance to adopt innovation and improve the efficiency of delivering lecture. Higher frequency would have greater likelihood to foster teachers' self-efficacy, improve their proficiency to implement various teaching functions using technology, and thereby enhance the quality of job performance. In contrast, infrequent use would likely have lower degree of familiarity with the tools and have little contribution to the quality of instruction.

Technology access

It indicates the degree of availability of adequate digital device, internet connection, software application and other technology facilities to effectively deliver instruction. Technology access determines whether teachers can practically use their skills in the classroom (Ogwu et al., 2023; Sabiteka et al., 2025).

Institutional support

It means to what extent the management of the school provides environment conducive to efficient use of e-learning materials. It implies various factors such as training, technical support, technological infrastructure, policy of technology use, encouragement and assistance by administration (Ogwu et al., 2023; Sabiteka et al., 2025).

Teacher job performance

Job performance refers to the extent to which a person effectively carries out given activities and contributes to organisational goals. In education, teachers' job performance relates to how well teachers accomplish their instructional, assessment, classroom management, communication and administrative obligations. It comprises lesson preparation, lesson delivery, student participation, classroom control, assessment, feedback, record keeping, punctuality, professional conduct and productivity (Quttainah et al., 2025).

EdTech and instructional work

Lesson delivery relates to the way teachers convey subject knowledge, explain concepts, engage learners and achieve instructional objectives. A successful classroom delivery should possess clarity, organisation, effective communication skills, subject knowledge and ability to use effective instructional tools (Ravichandran & Shanmugam, 2024; Liang et al., 2024).

Classroom management comprises of the process to maintain order, regulate activities and manage behaviour, ensure learning environment for positive results. Classroom management appears to be one of the strongest predictors of teacher's performances (Tzenios, 2020).

Challenges of EdTech adoption

In addition to the benefit already, the adoption of EdTech among private schools' teachers will encounter challenges: Digital Competency Some teachers do not have adequate digital skills to employ digital assessment, multimedia applications and on-line learning resources efficiently; therefore, it can lead to teacher fear and resistance towards learning. Moreover, some teachers would depend more on technologically capable colleagues, making them feel incompetent and isolated (Liang et al., 2024). Poor Infrastructure Internet reliability and consistent electricity can be a crucial impediment for teachers using EdTech in classrooms.

Increased Teacher Workload When technology is not incorporated in a planned way and workload distribution not properly redistributed, then the implementation of the technology is perceived by teachers as increased workload.

2.2 Empirical Review

Technology competency and performance

2.3.1 Technology Competency and Job Performance

Usage frequency and performance

2.3.2 Frequency of Technology Use and Job Performance

Technology access and performance

2.3.3 Technology Access and Job Performance

Institutional support and performance

2.3.4 Institutional Support and Job Performance

Research gap

In the existing literature, significant lacunas were found. The issues were identified under the following research gap categories; Firstly, population gap: Most of the empirical studies focusing on educational technology have placed emphasis on students, university students or graduates, rather than on teachers. For example, Liang et al. (2024), analyzed how educational technology enhanced learning, productivity and motivation in students. Similarly Anekwe (2017) and Monil et al. (2022) investigated the impact of virtual classroom learning among students in Nigerian universities and students' online learning readiness in relation to satisfaction and performance, respectively. While these studies prove the relevance of educational technology in education, they are unlikely to provide data on how the technology characteristics of teachers impact on their job performance.

2.3 Theoretical Review

Technology Acceptance Model

The Technology Acceptance Model was developed by Fred Davis in 1985. The model explains the factors that influence individuals' acceptance and use of new technologies. According to the model, two major factors determine technology adoption: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which a person believes that using a particular technology will improve job performance. Perceived ease of use refers to the extent to which a person believes that using the technology will be free from difficulty.

Human Capital Theory

2.2.2 Human Capital Theory

Diffusion of Innovation Theory

2.2.3 Diffusion of Innovation Theory

Theoretical position

2.2.4 Justification for the Adopted Theories

Table 1 Analytical framework

Predictor		Outcome	Proposed mechanism
Technology competency		Teacher performance	job Knowledge and confidence to use digital tools
Technology usage frequency		Teacher performance	job Routine application in instructional tasks
Technology access		Teacher performance	job Availability of devices, connectivity, and software
Institutional support		Teacher performance	job Training, policy, encouragement, and technical help

Methodology

3.1 Research Design and Setting

This study adopted a descriptive survey research design. The design is considered appropriate because it enables the researcher to collect quantitative data on the relationship between technology competency, technology usage frequency, technology access, institutional support and job performance among private school teachers in Kubwa and Gwarinpa, Abuja. The design allowed the researcher to gather data on teachers' level of technology competency, how frequently they use digital technologies in teaching, their level of access to technological resources, and the level of institutional

support provided by their schools. It also helped to examine how these variables influence teachers' job performance in areas such as lesson delivery, classroom management, assessment practices, feedback, record keeping and productivity. According to Onodugo, Ugwuonah and Ebinne (2010), descriptive survey research is appropriate for studies that seek to collect standardized data from a population in order to describe relationships among variables. The design is suitable for this study because it does not manipulate variables but examines existing conditions as they naturally occur among private school teachers in the study area.

The study was undertaken in Kubwa and Gwarinpa, Abuja, Federal Capital Territory (FCT), Nigeria. Kubwa and Gwarinpa are major residential and educational areas in Abuja with a significant number of private nursery, primary and secondary schools. These areas are suitable for the study because private schools within them increasingly use digital tools such as online learning platforms, mobile learning applications, digital instructional materials, virtual classroom platforms, school portals and digital assessment systems to support teaching and learning activities.

3.2 Population Sample and Sampling

The population base comprised 32,489 private school teachers in the Federal Capital Territory. Taro Yamane's formula at a 5% margin of error produced a planned sample of 395. Stratified sampling divided the sample equally by study location: 198 respondents in Kubwa and 197 in Gwarinpa. A total of 346 usable responses were obtained, representing 87.6% of the planned sample.

Table 2 Planned sample distribution

Location	Allocation	Planned sample
Kubwa	50%	198
Gwarinpa	50%	197
Total	100%	395

3.3 Instrument Validity and Reliability

For the purpose of data collection, the study adopted the use of a structured questionnaire. In the structured questionnaire, participants were required to respond to options that ranged from Strongly Agree (5), Agree (4), Undecided (3), Disagree (2), and Strongly Disagree (1). The questionnaire contains two sections. Section A focuses on demographic information (age, gender, educational qualification, employment status, etc.), while Section B borders on items measuring the study variables, which include technology competency, technology usage frequency, technology access, institutional support and teacher job performance.

To ensure the validity of the instrument, the questionnaire was subjected to face and content validation by experts in Educational Technology, Business Administration, and Measurement and Evaluation. The experts examined the questionnaire items to determine their clarity, relevance, adequacy and alignment with the objectives, research questions and hypotheses of the study. The validation process helped to ensure that the items properly measure the key variables of the study, measuring technology competency, usage frequency, access and institutional support was reviewed to ensure they adequately capture the constructs under investigation. Similarly, job performance items were assessed to ensure they reflect lesson delivery, assessment practices, classroom management, record keeping, feedback and productivity. The observations, corrections and recommendations of the experts were incorporated into the final version of the questionnaire before it is administered to the respondents.

A pilot study was conducted to determine the reliability of the research instrument. The pilot test was carried out among private school teachers outside the selected schools in Kubwa and Gwarinpa, but within a similar educational environment in Abuja. This is to ensure that the pilot respondents share similar characteristics with the actual study respondents but are not part of the main sample. The data obtained were analyzed using Cronbach's Alpha to determine internal consistency. The coefficient of

the reliability for all variables was found to be higher than 0.7094 that is 76%. This indicates a strong and positive correlation. Therefore, the research instrument was adjudged as being very reliable.

Table 3 Scale reliability

Scale	Items	Cronbach alpha
Technology competency	5	.830
Technology usage frequency	5	.761
Technology access	5	.832
Institutional support	5	.822
Teacher job performance	8	.867

3.4 Data Analysis and Model

The data collected was evaluated using both descriptive and inferential statistics. Descriptive statistics (frequency distribution, percentages, mean, and standard deviation) were utilized to answer the study questions. Inferential statistics was employed to test the hypotheses at the 0.05 level of significance. Specifically, the regression analysis was utilized to determine the predictive influence of independent factors on the dependent variable. Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS) version 28

The estimated model was $TPP = \beta_0 + \beta_1TEC + \beta_2TEU + \beta_3TEA + \beta_4TIS + \varepsilon$, where TPP denotes teacher job performance; TEC, technology competency; TEU, technology usage frequency; TEA, technology access; and TIS, institutional support. Hypotheses were evaluated at the 5% significance level.

3.5 Ethical and Design Considerations

Participation was voluntary, and responses were reported in aggregate. The cross-sectional, self-report design supports association and prediction but does not establish causal order. Results are specific to selected private schools in Kubwa and Gwarinpa and should be generalized cautiously.

Results and Discussion

4.1 Respondent and Descriptive Results

The final sample comprised 346 teachers. Women represented 73.1% and men 26.9%. Most respondents were aged 31–40 years (58.7%), followed by those aged 41 years and above (29.2%). Mean scores were high for technology competency ($M = 4.289$, $SD = .617$), job performance ($M = 4.157$, $SD = .565$), institutional support ($M = 3.879$, $SD = .816$), technology access ($M = 3.811$, $SD = .920$), and usage frequency ($M = 3.746$, $SD = .702$). The relatively lower usage mean suggests that having competence and resources did not always translate into routine classroom use.

Table 4 Descriptive statistics

Variable	Mean	SD	Minimum	Maximum
Technology competency	4.289	.617	2.00	5.00
Technology usage frequency	3.746	.702	1.80	5.00
Technology access	3.811	.920	1.00	5.00
Institutional support	3.879	.816	1.20	5.00
Teacher job performance	4.157	.565	1.50	5.00

4.2 Correlation Results

Teacher job performance correlated positively with technology competency ($r = .279$, $p < .01$), usage frequency ($r = .375$, $p < .01$), and institutional support ($r = .183$, $p < .01$). Its correlation with technology access was weak and nonsignificant ($r = .093$). The predictors were moderately intercorrelated, but tolerance values of .501–.646 and variance inflation factors of 1.547–1.996 indicated no serious multicollinearity.

Table 5 Correlations among study variables

Variable	TEC	TEU	TEA	TIS	TPP
Technology competency	1				
Usage frequency	.530**	1			
Technology access	.294**	.597**	1		
Institutional support	.477**	.533**	.610**	1	
Teacher performance	.279**	.375**	.093	.183**	1

Note. N = 346. ** $p < .01$.

4.3 Regression and Hypothesis Tests

The multiple-regression model was statistically significant, $F(4, 341) = 18.140$, $p = .001$. The multiple correlation was .419; R^2 was .175 and adjusted R^2 was .166. Thus, the four dimensions jointly explained 17.5% of the variance in teacher job performance. The standard error of estimate was .51565 and the Durbin–Watson statistic was 1.981, supporting independence of residuals.

6 Multiple regression results

Predictor	B	SE	Beta	t	p	Decision
Technology competency	.086	.056	.094	1.537	.125	Not significant
Usage frequency	.348	.056	.433	6.232	.001	Significant
Technology access	−.133	.042	−.217	−3.148	.002	Significant
Institutional support	.028	.047	.040	.587	.558	Not significant

Note. Dependent variable: teacher job performance. $R^2 = .175$; adjusted $R^2 = .166$.

Discussion

Technology competency and teacher performance

Technology competency had a positive but nonsignificant unique effect. Teachers may possess digital knowledge without applying it consistently to lesson preparation, delivery, assessment, communication, or records. Competency is therefore an enabling condition rather than a sufficient cause of improved performance. The result also reflects overlap among the predictors: competency was correlated with usage frequency and institutional support, so its zero-order association was reduced in the simultaneous model.

Professional development should consequently be practice-based. Short demonstrations of software are less likely to change performance than supported lesson design, coached classroom application, feedback, and repeated use. Schools should assess whether teachers can solve authentic instructional problems, not merely whether they attended training or report confidence.

Technology usage frequency and teacher performance

Usage frequency was the strongest positive predictor. Repeated use can reduce operational friction, build fluency, and integrate technology into planning, instruction, assessment, feedback, communication, and record keeping. This finding supports the task–technology fit argument that performance improves when suitable tools are regularly applied to relevant work rather than adopted symbolically.

Frequency should not be pursued as an end in itself. Mandatory screen time or platform logins can increase activity without improving instruction. Administrators should monitor meaningful use, including whether technology saves time, improves feedback, supports student engagement, or strengthens the accuracy and accessibility of records.

Technology access and teacher performance

Technology access had a statistically significant negative coefficient after the other predictors were controlled, even though its bivariate correlation with performance was weak and positive. This sign

reversal requires careful interpretation. It may reflect overlap with usage and support, differences in the quality or usability of available resources, additional workload created by poorly integrated systems, or a suppression effect in the regression model. The result does not justify reducing access. The practical lesson is that provision must be evaluated in context. Devices, connectivity, software, electricity, maintenance, authentication procedures, and technical assistance must work as a usable system. Schools should examine downtime, duplicate platforms, teacher workload, and whether supplied tools match curriculum and classroom needs.

Institutional support and teacher performance

Institutional support was positive but nonsignificant in the full model. General encouragement, policies, or occasional training may not affect performance unless they change actual use. Support may operate indirectly by improving competence, access, and frequency rather than producing a separate direct effect. The moderate correlations among these constructs are consistent with that possibility.

Schools should make support timely and task-specific. Peer mentors, rapid technical assistance, protected practice time, leadership modeling, and clear digital procedures can help teachers turn resources into routine practice. Future research should formally test usage frequency as a mediator between support, competence, access, and performance.

4.5 Theoretical and Managerial Implications

The findings extend the Technology Acceptance Model by showing that capability and support are not equivalent to realized use. Perceived usefulness and ease of use matter because they shape continued engagement. Human Capital Theory explains why competency is valuable, but the nonsignificant coefficient demonstrates that human capital must be deployed. Diffusion of Innovation Theory further suggests that adoption depends on compatibility, trialability, visibility of benefits, and social reinforcement.

For managers, the priority is to move from acquisition to integration. Technology plans should begin with instructional problems, define intended performance outcomes, select appropriate tools, prepare teachers, provide support, and evaluate use and results. This cycle avoids assuming that expenditure, access, or training attendance proves educational value.

Conclusion

Educational technology adoption significantly explained teacher job performance as a combined system, but the individual dimensions operated differently. Frequent use made the strongest positive contribution. Technology access was significant but negative after adjustment, while competency and institutional support were not significant unique predictors. The evidence therefore distinguishes possession from productive use.

Private schools should not judge digital transformation by the number of devices, applications, or training sessions. Performance gains depend on whether teachers repeatedly use suitable, reliable tools for authentic instructional and administrative tasks. Access, competence, and support remain necessary, but they must converge in sustained, meaningful use.

Recommendations

1. Embed appropriate digital tools in routine lesson planning, delivery, assessment, feedback, communication, and record keeping.
2. Provide practice-based professional development with coaching, demonstration lessons, peer support, and opportunities to apply new skills.
3. Audit technology access for reliability, usability, curriculum fit, maintenance, connectivity, electricity, and effects on teacher workload.

4. Establish responsive technical-support arrangements and designate trained peer mentors within schools.
5. Use clear digital policies that protect privacy, define acceptable use, and avoid unnecessary duplication of platforms and reporting tasks.
6. Evaluate technology investment with teaching-quality and productivity indicators rather than purchase counts or login statistics alone.
7. Collect periodic teacher feedback to identify barriers and refine tools, training, and support.
8. Retain non-digital alternatives during outages and ensure that technology adoption does not exclude teachers or learners with limited resources.

Limitations and Future Research

The study was limited to selected private schools in two Abuja districts and relied on cross-sectional self-reports. Causal claims cannot be established, and school-level clustering was not modeled. Future studies should use longitudinal and mixed-method designs, include classroom observation and administrative outcomes, compare public and private schools, and test mediating roles of actual use, task–technology fit, and teacher engagement.

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