

Teachers' Online Teaching Skills and School Effectiveness in Public Senior Secondary Schools, Kwara State, Nigeria

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Abstrak

Penelitian ini dilatarbelakangi oleh transformasi digital dalam pendidikan yang terus berkembang serta meningkatnya tuntutan agar guru memiliki kompetensi pengajaran daring yang efektif untuk lingkungan pembelajaran virtual dan *blended learning*. Meskipun pendidikan digital telah meluas pascapandemi COVID-19, banyak guru sekolah menengah di Nigeria masih menghadapi tantangan dalam pelaksanaan pembelajaran daring, yang pada gilirannya memengaruhi kualitas pembelajaran dan efektivitas sekolah. Tujuan penelitian ini adalah untuk mengkaji sejauh mana keterampilan komunikasi dan interaksi daring, keterampilan penggunaan *Learning Management System* (LMS), keterampilan penilaian dan pemberian umpan balik daring, serta keterampilan pembuatan konten digital yang dimiliki guru memengaruhi efektivitas sekolah di sekolah menengah atas (SMA) di Negara Bagian Kwara. Penelitian ini menggunakan desain survei korelasional deskriptif. Populasi penelitian mencakup 7.675 guru di sekolah menengah atas negeri yang tersebar di enam belas wilayah pemerintah daerah di Negara Bagian Kwara. Sampel sebanyak 364 guru dipilih menggunakan teknik pengambilan sampel bertahap (*multistage sampling*), dan sebanyak 299 kuesioner yang telah diisi lengkap berhasil dikumpulkan serta dianalisis. Data dikumpulkan menggunakan kuesioner yang dirancang oleh peneliti dengan judul *Teachers' Online Teaching Skills and School Effectiveness Questionnaire* (TOTSSQ). Hasil penelitian menunjukkan bahwa keterampilan pengajaran daring guru dan tingkat efektivitas sekolah berada pada kategori sedang. Penelitian ini juga menemukan adanya hubungan yang signifikan antara keterampilan komunikasi dan interaksi daring, keterampilan penilaian dan pemberian umpan balik daring, serta keterampilan pembuatan konten digital guru dengan efektivitas sekolah menengah. Penelitian menyimpulkan bahwa kompetensi pengajaran daring guru berkontribusi secara signifikan terhadap peningkatan penyampaian pembelajaran, keterlibatan siswa, praktik penilaian, dan efektivitas sekolah secara keseluruhan. Penelitian ini memberikan kontribusi bagi kajian pendidikan dengan menyajikan bukti empiris mengenai peran pedagogi digital dalam meningkatkan efektivitas sekolah menengah di Nigeria.

Kata Kunci: *Keterampilan Mengajar Daring, Efektivitas Sekolah, Pembuatan Konten Digital, Penilaian dan Umpan Balik Daring, Sistem Manajemen Pembelajaran (LMS)*

Abstract

The study was motivated by the growing digital transformation of education and the increasing demand that teachers possess effective online teaching competencies for virtual and blended learning environments. Despite the expansion of digital education after the COVID-

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19 pandemic, many Nigerian secondary school teachers still face challenges in online instruction, thereby affecting instructional quality and school effectiveness. The purpose of the study was to examine the extent to which teachers' online communication and interaction skills, Learning Management System (LMS) utilisation skills, online assessment and feedback skills, and digital content creation skills influence school effectiveness in Kwara State senior secondary schools. The study adopted a descriptive correlational survey research design. The population comprised 7,675 teachers in public senior secondary schools across the sixteen Local Government Areas of Kwara State. A sample of 364 teachers was selected using multistage sampling techniques, while 299 completed questionnaires were retrieved and analysed. Data were collected using a researcher-designed questionnaire titled *Teachers' Online Teaching Skills and School Effectiveness Questionnaire (TOTSSQ)*. The findings revealed that teachers' online teaching skills and the level of school effectiveness were both moderate. The study further established significant relationships between teachers' online communication and interaction skills, online assessment and feedback skills, digital content creation skills, and secondary school effectiveness. The study concluded that teachers' online teaching competencies significantly improve instructional delivery, student engagement, assessment practices, and overall school effectiveness. The study contributes to educational research by providing empirical evidence on the role of digital pedagogy in enhancing the effectiveness of secondary schools in Nigeria.

Keywords: *Online Teaching Skills, School Effectiveness, Digital Content Creation, Online Assessment and Feedback, Learning Management System (LMS).*

Pendahuluan

Education remains a fundamental instrument for human capital development, national productivity, and social transformation in contemporary societies. In both developed and developing nations, the quality of educational outcomes is increasingly linked to schools' capacity to adapt to technological and pedagogical changes in rapidly evolving knowledge economies. In Nigeria, the education sector is expected to produce globally competitive graduates equipped with cognitive, technical, and digital competencies necessary for sustainable national development (Abdulganeey et al., 2025; Ofozoba et al., 2023). However, achieving this mandate depends substantially on school effectiveness, which is largely determined by the quality of teaching and teachers' professional competencies. The global transition toward digital education has significantly altered traditional teaching models, placing renewed emphasis on teachers' ability to teach effectively in virtual and blended learning environments (Crawford & Jenkins, 2017; Mulenga & Shilongo, 2025). The emergence of online teaching as a dominant instructional mode—particularly after the COVID-19 pandemic—has transformed educational delivery worldwide and redefined what constitutes teacher effectiveness (Kidd & Murray, 2020; Rapanta et al., 2020). In Nigeria, this transition exposed critical weaknesses in teacher preparedness, particularly in public secondary schools, where many educators were inadequately equipped with the technological and pedagogical skills needed for effective online instruction (Ogunbodede et al., 2023; Ahmed & Shittu, 2024).

From a social perspective, this deficiency has become an urgent educational and developmental concern. Inadequate online teaching skills among teachers contribute to unequal learning opportunities, widen the digital divide between urban and rural schools, and reinforce educational inequality among students, particularly given that public secondary schools in Nigeria already contend with infrastructural and pedagogical constraints (Ehighae & Okoh, 2024; UNESCO, 2021). School effectiveness—commonly defined through student academic performance, instructional quality, administrative efficiency, and school climate—is therefore increasingly dependent on teachers' capacity to integrate technology into teaching practice, specifically through digital content creation, online communication and interaction, Learning Management System (LMS) utilisation, and online assessment and feedback (Akanni, 2021; Mormah & Bassey, 2021; Odey et al., 2025).

Existing literature confirms that teachers' digital competence influences educational outcomes; however, important conceptual and contextual gaps remain when considered in light of this study's specific focus. Whereas most Nigerian studies have examined ICT availability, infrastructural constraints, or general attitudes toward e-learning as broad predictors of school outcomes (Nwokike et al., 2023), the present study departs from this trend by isolating four discrete online teaching competencies and testing their individual relationships with measurable indicators of school effectiveness. Similarly, while international studies have demonstrated positive links between online teaching skills and educational performance, these findings were generated predominantly in technologically advanced contexts with stronger infrastructure and teacher-training systems (Boelens et al., 2018; Okai-Ugbaje et al., 2022); the present study instead tests whether comparable relationships hold under the infrastructural and resource constraints characteristic of Nigerian public secondary education. A further methodological gap persists: prior studies have largely treated teachers' online teaching skills as a single, undifferentiated construct, whereas this study disaggregates the construct into digital content creation, online communication, LMS utilisation, and online assessment to determine whether these dimensions relate to school effectiveness in different ways. Finally, empirical attention to public senior secondary schools in Kwara State has been limited, despite their strategic importance within Nigeria's post-basic education system, leaving the present study as one of the first to generate context-specific evidence at this level.

Theoretically, this relationship can be understood through the lens of Technological Pedagogical Content Knowledge (TPACK), which conceptualises effective teaching in digital environments as the integration of technological, pedagogical, and content knowledge (Chai et al., 2013). Within this framework, online teaching skills such as digital content creation and LMS utilisation are not merely technical add-ons but represent teachers' capacity to transform subject content into forms that are accessible, interactive, and pedagogically sound in virtual settings. This teacher-level competence, in turn, aligns with input-process-output models of school effectiveness, which position teacher quality and instructional practice as critical process variables that convert institutional inputs, such as infrastructure and policy support, into measurable outputs, including student achievement, engagement, and institutional performance (Bruns et al., 2011; Kim & Lee, 2020). Applied to the present study, teachers' online communication and interaction skills are theorised to strengthen learner engagement and motivation, a recognised precursor to academic performance; LMS utilisation skills are theorised to improve administrative efficiency and instructional continuity; online assessment and feedback skills are theorised to enhance the accuracy and responsiveness of the teaching-learning cycle; and digital content creation skills are theorised to improve the quality of instructional delivery. Collectively, these mechanisms provide the theoretical rationale for expecting teachers' online teaching skills to predict, rather than merely correlate with, school effectiveness outcomes.

Building on this theoretical rationale and the gaps identified above, the present study derives its novelty and significance. Rather than repeating the multidimensional framing already established, the study's distinct contribution lies in empirically testing—within a resource-constrained, previously unexamined context—the theorised pathways linking each online teaching skill dimension to specific school effectiveness indicators. This approach offers a more nuanced, theory-grounded understanding of teacher digital competence than earlier descriptive or broadly construct-based studies. It provides evidence-based insight for policy, teacher professional development, and school improvement planning in Nigeria's digital education era. Accordingly, this study contributes original empirical evidence to the emerging discourse on digital pedagogy by addressing a previously underexplored, theoretically grounded relationship between teachers' online teaching skills and school effectiveness in the public senior secondary school context of Kwara State, thereby filling an important scholarly and policy gap in Nigerian educational research.

Statement of The Problem

The rapid digital transformation of education has transformed global teaching and learning. Teachers today must have topic knowledge, pedagogical competence, and online

teaching skills to teach in virtual and blended learning contexts. These skills include digital content development, online communication, LMS use, and online evaluation and feedback. Despite the growing importance of these abilities, many Nigerian secondary school instructors lack the online teaching competence required to meet current educational needs (Yusuf & Murtala, 2025; Olanrewaju & Afolabi, 2022). This issue became increasingly apparent during and after the COVID-19 epidemic, when schools had to switch to digital and remote learning. This transition boosted the adoption of educational technology, but it also revealed gaps in teacher readiness, notably in public secondary schools, where many teachers struggled to adjust to online instruction (Geverola et al., 2022; Jin, 2023). Thus, many teachers used improvised teaching strategies that failed to meet learning outcomes, lowering instructional quality and school effectiveness.

Poor online teaching skills in Nigeria have far-reaching educational and societal effects. Poor online instructor competence reduces student engagement, academic performance, classroom delivery, and educational continuity during disruptions. It also widens the digital divide between urban and rural schools, reinforcing educational inequality and limiting students' access to 21st-century digital skills needed for future employability and national development. Most studies on ICT integration and technology adoption in Nigerian schools have focused on infrastructural issues, teacher attitudes toward technology, or digital preparation (Bolaji & Adeoye, 2022; Oshowole, 2024). These studies offer valuable insights, but they have yet to examine how specific online teaching skills affect the effectiveness of secondary schools. This raises the question of whether teachers' online communication, LMS use, digital content creation, and online assessment skills improve school outcomes, such as classroom teaching, student academic performance, record-keeping, and discipline.

Many international studies have found positive relationships between teachers' digital competencies and educational outcomes (Boelens et al., 2018; Cao et al., 2023; Rawal, 2024), but these findings were mostly from technologically advanced environments with better infrastructure and teacher-training systems. Their direct applicability to Nigeria—particularly to public senior secondary schools in Kwara State—is restricted by contextual variables such as insufficient internet connectivity, minimal educational budget, and inconsistent professional development. A large contextual gap requires local empirical proof. Another issue is that many Nigerian studies have considered teachers' online teaching skills as a single construct without defining them. This hinders policymakers' capacity to design targeted teacher development programs and limits awareness of which online teaching abilities boost school performance.

Despite Nigeria's increased focus on digital education, there is no data on how teachers' online teaching skills affect school effectiveness in public senior secondary schools in Kwara State. This knowledge gap makes it hard for educational planners, administrators, and politicians to develop evidence-based teacher training, digital resource allocation, and school improvement measures. Thus, the lack of empirical evidence on how teachers' online teaching skills affect secondary schools in Kwara State, Nigeria, prompted this study. This study examines how teachers' digital content creation, online communication and interaction, LMS utilisation, and online assessment and feedback skills improve school effectiveness in public senior secondary schools in Kwara State, thereby filling that gap.

Research Questions

The following research questions were raised and answered in this study:

1. What are the various forms of teachers' online teaching skills in Kwara State senior secondary schools?
2. What is the level of senior secondary school effectiveness in Kwara State, Nigeria?

Research Hypotheses

The following research hypotheses were tested in this study at the 0.05 level of significance:

H₀₁: There is no significant relationship between teachers' online communication and interaction skills and secondary school effectiveness in Kwara State senior secondary schools.

H₀₂: There is no significant relationship between teachers' online assessment and feedback skills and secondary school effectiveness in Kwara State senior secondary schools

H₀₃: There is no significant relationship between teachers' digital content creation skills and secondary school effectiveness in Kwara State senior secondary schools

Review of Related Literature

Secondary school effectiveness is the extent to which schools meet their educational goals through excellent instruction, increased student academic outcomes, efficient school administration, and holistic learner development. School success has traditionally been measured by student performance on standardised tests, school completion rates, and higher education transitions (York et al., 2015). Modern viewpoints characterise school performance as a multidimensional term that includes instructional quality, student discipline, teacher productivity, leadership effectiveness, stakeholder satisfaction, and institutional adaptation (Cheng, 2022). Because secondary education connects foundational education to university or occupational advancement, the effectiveness of secondary schools is a key policy issue in Nigeria. Effective secondary schools should develop students with academic skills, social responsibility, critical thinking, creativity, and modern-day employability. Alam et al. (2025) define effective schools as those that meet educational goals through integrated institutional structures, competent teachers, and conducive learning environments. These definitions show a conceptual progression rather than a consensus: earlier accounts (Ayeni & Ibukun, 2013; York et al., 2015) anchor effectiveness narrowly in measurable academic outputs, whereas more recent accounts (Cheng, 2022; Alam et al., 2025) encompass institutional and stakeholder processes. This shift implies that school effectiveness can no longer be adequately captured by examination outcomes alone, thereby justifying the study's use of a multidimensional effectiveness measure that includes instructional delivery, assessment practices, and administrative efficiency, along with academic performance.

Several interconnected elements affect Nigerian school effectiveness. Teacher competency is a good predictor of school performance because teachers directly affect instructional quality and student learning (Blömeke et al., 2016). Principals set strategy, ensure responsibility, and define institutional culture; leadership quality affects effectiveness (Nnah & George, 2025). Schools' ability to provide great education depends on classrooms, labs, libraries, and digital infrastructure. Parental and community involvement increases attendance, discipline, and academic performance. Many studies define school effectiveness in face-to-face classrooms, despite these recognised factors. Not much is spoken about digital pedagogy and instructors' online skills. This conceptual gap is critical, especially in the post-pandemic era when technology-mediated instruction is crucial to educational continuity and institutional performance. Teacher competence, leadership quality, and resource availability are consistently identified as determinants of effectiveness across these studies, but they are rarely examined in relation to each other. Most accounts treat them as parallel, additive factors rather than testing whether digital competence moderates or channels the influence of leadership and resources on outcomes. This unexamined connection is the conceptual area the present study occupies by separating teachers' online teaching skills as a discrete, testable process variable rather than "teacher competence."

Online teaching requires technological, pedagogical, and communication skills to develop, deliver, manage, and assess training in digital learning environments. Beyond digital literacy, these skills include generating digital learning materials, managing virtual classrooms, facilitating online interactions, administering digital assessments, and using learning management systems. Teachers' roles have changed worldwide due to online and blended learning (Rahimi & Oh, 2024; Saxena, 2025). COVID-19 forced schools to implement remote learning methods overnight, accelerating this shift. This quick transition showed differences in teachers' online teaching readiness, especially in developing countries like Nigeria, where many teachers needed technological training and institutional support (Yidana et al., 2023). The government's interest in digital education, student demand for flexible learning, and interruptions to traditional schooling have made online teaching competency more important in Nigeria (Chukwuemeka et al., 2021). These sources suggest that pandemic-

accelerated digital pressures exposed weak teacher preparedness, but the evidence is largely descriptive and comes from studies that did not directly link online teaching competence to institutional outcomes. Both Rahimi and Oh (2024) and Saxena (2025) document global professional role changes, while Yidana et al. (2023) and Onyema (2020) document local resource constraints; however, neither explains why some Nigerian teachers with comparable infrastructural disadvantages report higher levels of online teaching competence. This study analyses this unresolved variation, not infrastructure alone.

Effective online teachers improve instructional continuity, student engagement, and institutional resilience (Adomako Gyasi & Sun, 2026). Online instruction is less successful for many Nigerian secondary school instructors due to inadequate digital training, poor internet connectivity, and limited technology resources (Onyema, 2020). Nigerian studies on teacher ICT competency rarely mention online teaching competence as a distinct instructional construct (Akomolafe et al., 2024; Ajani, 2024). This conceptual ambiguity hinders the understanding of how online teaching competencies affect educational outcomes, such as school effectiveness. Teachers' online teaching skills are multifaceted. This study examines four elements of online teaching skills. The first is digital content creation, which requires teachers to create and adapt digital learning resources. This involves creating multimedia presentations, instructional movies, interactive slides, and online courses. Effective digital material creation boosts learner engagement and comprehension (Carroll et al., 2021). Second, teachers need online communication and interaction abilities to maintain meaningful teacher-student engagement in virtual environments (Archambault et al., 2022). Online learning lowers face-to-face interaction; professors must use discussion forums, live sessions, messaging platforms, and collaboration tools to motivate students. The third dimension is LMS use, which involves using Google Classroom, Moodle, and Canvas to organise lessons, distribute materials, manage assignments, track progress, and maintain records (Anozie et al., 2024). Online assessment and feedback skills – designing legitimate digital examinations and providing timely, constructive, and personalised feedback – are the fourth dimension (Ahmed & Sidiq, 2023). These qualities are crucial for student learning, monitoring, and academic success. Most research has studied these skills jointly, making it hard to discern which aspects most affect school efficiency. This study addresses that constraint by examining each dimension separately. Comparing the four aspects, digital content development and LMS use are input-focused on teachers' work. In contrast, online communication and evaluation emphasise teacher-student relationships and feedback. The distinction is analytically important because it suggests that production-oriented skills may directly affect instructional quality, while relational skills may affect engagement and retention. The literature examined here assumes all four dimensions are equally likely to matter, without predicting which would exhibit the strongest correlation, which the present study's disaggregated hypotheses aim to answer empirically.

In recent years, scholars have focused on instructors' online teaching skills and school success. Online teaching helps maintain learning throughout pandemics, strikes, and environmental disasters. Digitally capable teachers help schools maintain academic schedules and avoid learning loss. Virtual collaboration, gamification, and multimedia instruction boost student engagement in online teaching. Engaged students perform better, attend more, and drop out less, improving school effectiveness. Teachers' internet skills improve administrative efficiency through digital attendance systems, automated grading, online record management, and parent-school communication. These operational benefits boost institutional performance beyond classrooms. Although these effects are recognised internationally, there is no empirical evidence tying Nigerian secondary school teachers' online teaching skills to school effectiveness. This paper proposes three mechanisms – continuity of learning, engagement, and administrative efficiency – which are presented as parallel benefits rather than as integrated into a unified explanatory chain. Administrative efficiency benefits may be a precondition for improved engagement or an independent outcome, and the literature does not compare these pathways. TPACK and input-process-output framing are used in this study because only a process-based framework can effectively organise these mechanisms,

rather than merely list them, in contrast to the additive-benefits logic used in previous Nigerian studies.

The literature review shows four main deficiencies. First, most Nigerian research focuses on ICT proficiency rather than on instructors' online teaching skills, creating a conceptual mismatch. Few studies directly examine the association between online teaching skills and secondary school effectiveness, creating an empirical gap. Third, studies rarely explore how digital content development, communication, LMS use, and online evaluation affect school success independently. Fourth, despite Kwara State's expanding focus on digital education, there is no data on public senior secondary schools. This multidimensional, context-specific research on how teachers' online teaching skills affect school effectiveness in public senior secondary schools in Kwara State, Nigeria, fills these gaps. The conceptual gap (treating digital competence broadly) may cause the dimensional gap (failing to disaggregate specific skills) because studies that do not first distinguish online teaching competence from general ICT competence have no basis for separating its component skills. The absence of Kwara State-specific data means that any weak empirical linkage in the wider Nigerian literature cannot be assumed to hold locally, compounding the empirical and contextual gaps. Instead of four equally weighted omissions, the four gaps constitute a single chain from definitional imprecision to the specific evidentiary shortage our study seeks to rectify.

Metode

This study used descriptive correlational survey research. The descriptive survey approach enabled the researcher to collect data from a representative sample of instructors and to describe both online teaching skills and school effectiveness in Kwara State senior secondary schools. The correlational approach was acceptable because the study attempted to investigate the nature and extent of teachers' online teaching skills and school effectiveness.

The design allowed this study to collect quantitative data on teachers' digital content creation, online communication and interaction, Learning Management System (LMS) use, online assessment and feedback, and school effectiveness in public senior secondary schools in Kwara State, Nigeria. This survey included all public senior high school teachers in Kwara State's sixteen LGAs. The Kwara State Teaching Service Commission (TESCOM) reported 7,675 teachers, 3,896 male and 3,779 female. Asa (410), Baruten (175), Edu (333), Ekiti (179), Ifelodun (483), Ilorin East (969), Ilorin South (1,205), Ilorin West (1,776), Irepodun (500), Isin (164), Kaiama (114), Moro (425), and Offa, Oke-Ero, Oyun, and Patigi had an estimated 922 teachers. These teachers were studyable. The Research Advisors' Sample Size Table (2016) recommended 364 respondents for a population of 7,000-8,000 with 95% confidence and 5% margin of error. Multistage sampling was used to choose study participants. First, Kwara State's sixteen LGAs were ranked by teacher population. In the second stage, proportionate sampling was used to assign sample sizes to LGAs based on the number of teachers in each LGA. Simple random sampling selected public senior high schools from each LGA in the third step. To provide all responders an equal chance, teachers were randomly picked from the sampled schools. Table 1 shows the LGA sample distribution.

Table 1

Distribution of Sample across Local Government Areas

LGA	Teacher Population	Sample Size
Asa	410	19
Baruten	175	8
Edu	333	16
Ekiti	179	8
Ifelodun	483	23
Ilorin East	969	46
Ilorin South	1,205	57
Ilorin West	1,776	84

LGA	Teacher Population	Sample Size
Irepodun	500	24
Isin	164	8
Kaiama	114	5
Moro	425	20
Offa, Oke-Ero, Oyun, and Patigi	922	46
Total	7,675	364

The final sample comprised 185 male teachers and 179 female teachers.

The instrument used for data collection was a researcher-designed questionnaire titled *Teachers' Online Teaching Skills and School Effectiveness Questionnaire (TOTSSQ)*. The questionnaire was structured into two sections. Section A elicited information on respondents' demographic characteristics, while Section B contained items designed to measure teachers' online teaching skills and school effectiveness. The online teaching skills component covered four dimensions: digital content creation skills, online communication and interaction skills, Learning Management System (LMS) utilisation skills, and online assessment and feedback skills. The questionnaire consisted of 20 items structured on a four-point Likert rating scale: Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, and Strongly Disagree (SD) = 1. The instrument was designed to generate quantitative data suitable for addressing the research questions and testing the study's hypotheses. To ensure the instrument's validity, the questionnaire underwent face and content validation by experts in Educational Management, Measurement, and Evaluation. Specifically, three lecturers from the Department of Educational Management and Counselling, Al-Hikmah University, Ilorin, together with the researcher's supervisor, examined the instrument for clarity, relevance, language appropriateness, and the adequacy of the items in measuring the variables under investigation. Their observations, corrections, and recommendations were incorporated into the final version of the questionnaire before it was administered to the respondents. The reliability of the instrument was established through a pilot study conducted outside the sampled schools but within similar public senior secondary schools in Kwara State. Thirty-six copies of the questionnaire were administered to teachers who were not part of the main study sample. The responses obtained were analysed using the Pearson Product-Moment Correlation Coefficient (PPMC) to assess the instrument's internal consistency and stability.

The reliability coefficient obtained indicated that the instrument was reliable and suitable for data collection. The researchers personally visited the selected schools, assisted by trained research assistants, to administer the questionnaire to the respondents. The purpose of the study was clearly explained to the respondents, and adequate instructions were provided for completing the questionnaire. Respondents were assured of confidentiality and anonymity of the information provided. The completed questionnaires were collected immediately after completion, where possible, while others were retrieved on subsequent visits to ensure a high retrieval rate. The data collected for the study were analysed using both descriptive and inferential statistics. Descriptive statistics, including frequency counts, percentages, mean, and standard deviation, were used to answer the research questions. Inferential statistics using the Pearson Product-Moment Correlation (PPMC) were used to test the study's hypotheses at the 0.05 level of significance. The Statistical Package for the Social Sciences (SPSS) was used to analyse the data. For interpreting the mean scores, the following decision benchmark was adopted: 1.00–1.49 = Very Low, 1.50–2.49 = Low, 2.50–3.24 = Moderate, and 3.25–4.00 = High. The results of the analysis were presented in tables and interpreted in line with the study's research questions and hypotheses.

Hasil dan Pembahasan

The findings on the relationship between teachers' online teaching skills and school effectiveness in senior secondary schools in Kwara State, Nigeria. Two research questions were answered using descriptive statistics, including mean scores and standard deviations. The

operational hypotheses generated were tested using the Pearson product-moment correlation at a 0.05 level of significance. To interpret the instrument items, mean ratings of 1.50-2.49 indicate low, 2.50-3.24 indicate moderate, and 3.25-4.00 indicate high. Of the 364 copies of the instrument administered to the respondents, only 299 (82.1%) were retrieved and subjected to data analysis.

Research Question 1: What are the various forms of teachers' online teaching skills in Kwara State senior secondary schools?

Table 2

Mean and Standard Deviation of Responses on the Various Forms of Teachers' Online Teaching Skills in Kwara State Senior Secondary Schools

S/N	Teachers' Online Communication and Interaction Skills	Mean	SD	Decision
1	Effective online communication between teachers and students improves school outcomes.	3.95	.765	High
2	Online interaction skills enhance students' participation in virtual lessons.	2.67	.274	Moderate
3	Teachers' ability to communicate online increases student engagement and learning success.	3.56	.875	High
4	Schools are more effective when teachers maintain regular online interaction with learners.	2.86	.836	Moderate
5	Online communication fosters collaboration among teachers, students, and parents, improving school performance.	2.77	.963	Moderate
	Average Mean	3.16	0.743	Moderate
S/N	Teachers' Learning Management System (LMS) Utilisation Skills	Mean	SD	
11	The use of LMS platforms makes lesson delivery more organised and effective.	3.39	.632	High
12	Teachers with LMS skills improve record-keeping and student performance tracking in schools.	3.02	.784	Moderate
13	Schools are more effective when teachers can upload and manage learning materials on LMS platforms.	2.88	.742	Moderate
14	LMS usage enhances collaboration between teachers and students in secondary schools.	2.96	.555	Moderate
15	Teachers' mastery of LMS tools contributes to the efficiency of school administration.	3.78	.665	High
	Average Mean	3.21	0.676	Moderate
S/N	Teachers' Online Assessment and Feedback Skills	Mean	SD	
21	Online assessment tools help teachers evaluate students' performance more effectively.	3.60	.612	High
22	Teachers who provide timely online feedback contribute to improved school performance.	3.76	.763	High
23	Online assessment skills enhance transparency and accountability in schools.	3.52	.835	High
24	Schools are more effective when teachers use digital platforms to assess and grade students.	3.28	.935	High
25	Providing feedback online motivates students and strengthens overall school effectiveness.	3.67	.836	High
	Average Mean	3.57	0.796	High
S/N	Teachers' Digital Content Creation Skills	Mean	SD	
31	Creating digital instructional content improves students' understanding of lessons.	3.83	.504	High
32	Digital content creation skills help to enhance school academic performance.	2.09	.385	Low
33	Teachers who create digital learning materials contribute to effective school management.	3.11	.987	Moderate

34	Digital content creation enables schools to provide diverse learning resources.	3.64	.635	High
35	Schools become more effective when teachers design innovative digital content.	2.96	.845	Moderate
Average Mean		3.13	0.671	Moderate
Teachers' Online Teaching Skills		3.27	0.722	Moderate

Table 2 indicates the various forms of teachers' online teaching skills in Kwara State senior secondary schools. The mean of teachers' online communication and interaction skills was 3.16, with a standard deviation of .743; teachers' learning management system (LMS) utilisation skills were 3.21, with a standard deviation of .676; and teachers' online assessment and feedback skills were 3.57, with a standard deviation of .796. Teachers' digital content creation skills had a mean of 3.13 and a standard deviation of 0.671. In addition to that, findings showed that the various forms of teachers' online teaching skills in Kwara State senior secondary schools are moderate, with a mean score of 3.27

Research Question 2: What is the level of senior secondary school effectiveness in Kwara State, Nigeria?

Table 3

Level of Senior Secondary School Effectiveness in Kwara State, Nigeria

S/N	Items	Mean	SD	Decision
1	Students in this school perform well in internal and external examinations.	2.67	.605	Moderate
2	Teachers in this school deliver lessons effectively and consistently.	3.50	.352	High
3	The school has a clear vision and leadership that promotes academic excellence.	2.99	.723	Moderate
4	Available resources (e.g., ICT, library, laboratories) are adequately utilised for learning.	3.67	.305	High
5	The school promotes discipline and maintains a positive learning environment.	3.74	.372	High
6	Teachers regularly assess students' progress and provide timely feedback.	2.84	.403	Moderate
7	Students are motivated and actively engaged in their learning.	3.01	.603	Moderate
8	Parents and the community are actively involved in supporting the school's activities.	2.84	.562	Moderate
9	The school adapts well to changes such as the use of technology in teaching and learning.	3.22	.673	Moderate
10	The school achieves its educational goals effectively.	3.73	.836	High
Level of Senior Secondary School Effectiveness		3.22	0.375	Moderate

Table 3 indicates the level of senior secondary school effectiveness in Kwara State, Nigeria. Findings show that the level of senior secondary school effectiveness in Kwara State was moderate, with a mean score of 3.22 and a standard deviation of .375.

H0₁: There is no significant relationship between teachers' online communication and interaction skills and secondary school effectiveness in Kwara State senior secondary schools.

Table 4

Teachers' Online Communication and Interaction Skills and Secondary School Effectiveness in Kwara State Senior Secondary Schools

Variables	N	Mean	SD	Df	Cal. r-value	p-value	Decision
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Teachers 'Online Communication and Interaction Skills	299	3.16	.743				
				297	.305	.000	H0₁ Rejected
Secondary School Effectiveness	299	3.22	.375				

$P < 0.05$

Table 4 shows that the p-value (.000) was less than the significance level (0.05) with 297 degrees of freedom and a calculated r-value of .305. Therefore, the null hypothesis, which states that there is no significant relationship between teachers' online communication and interaction skills and secondary school effectiveness in Kwara State senior secondary schools, was rejected. This implies a significant relationship between teachers' online communication and interaction skills and the effectiveness of secondary schools in Kwara State. This means that teachers' online communication and interaction skills influence the effectiveness of secondary schools.

H0₂: There is no significant relationship between teachers 'online assessment and feedback skills and secondary school effectiveness in Kwara State senior secondary schools

Table 5

Teachers' Online Assessment and Feedback Skills and Secondary School Effectiveness in Kwara State Senior Secondary Schools

Variables	N	Mean	SD	Df	Cal. r-value	p-value	Decision
Teachers' Online Assessment and Feedback Skills	299	3.57	.796				
				297	.421	.000	H0₃ Rejected
Secondary School Effectiveness	299	3.22	.375	299			

$P < 0.05$

Table 5 shows that the p-value (.000) was less than the significance level (0.05) with 297 degrees of freedom and a calculated r-value of .421. In this regard, the null hypothesis was rejected. This shows that there was a significant relationship between teachers 'online assessment and feedback skills and secondary school effectiveness in Kwara State senior secondary schools. This means that teachers 'online assessment and feedback skills enhance the level of secondary school effectiveness.

H0₃: There is no significant relationship between teachers' digital content creation skills and interaction skills and secondary school effectiveness in Kwara State senior secondary schools.

Table 6

Teachers' Digital Content Creation Skills and Interaction Skills and Secondary School Effectiveness in Kwara State Senior Secondary Schools

Variables	N	Mean	SD	Df	Cal. value	r-value	p-value	Decision
Teachers' Digital Content Creation Skills and Interaction Skills	299	3.13	.671					
				297	.444	.000		H0₄ Rejected
Secondary School Effectiveness	299	3.22	.375					

$P < 0.05$

Table 6 shows that the p-value (.000) was less than the significance level (0.05) with 297 degrees of freedom and a calculated r-value of .444. In this regard, the null hypothesis was rejected. This shows a significant relationship between teachers' digital content creation and interaction skills and the effectiveness of secondary schools in Kwara State. This means that teachers' digital content creation and interaction skills enhance the effectiveness of secondary schools.

Discussion

The findings of this study revealed that teachers' online teaching skills in public senior secondary schools in Kwara State were moderate overall, with online assessment and feedback skills recording the highest mean score among the identified dimensions. This finding aligns with the studies by Ajani (2024) and Akomolafe et al. (2024), which reported that teachers in Nigeria possess moderate levels of digital and online teaching competencies due to increased exposure to educational technologies following the COVID-19 pandemic. The finding also supports the submission of Archambault et al. (2022) that online teaching competence has become a multidimensional requirement involving communication, digital content creation, assessment, and technological management skills. However, the moderate level observed in this study contrasts with the findings of Ogunbodede et al. (2023), who found relatively low digital competencies among Nigerian teachers due to infrastructural limitations and inadequate professional development opportunities. The difference may be attributed to increased awareness and institutional emphasis on digital teaching skills in Kwara State secondary schools following the pandemic. The study further revealed that the level of effectiveness of senior secondary schools in Kwara State was moderate. This finding is consistent with the views of Akanni (2021) and Cheng (2022), who argued that school effectiveness in developing countries is often moderate because schools operate under challenging conditions, including inadequate resources, insufficient infrastructure, and administrative constraints. The result also agrees with Preston et al. (2017), who emphasised that school effectiveness is influenced by multiple institutional and instructional variables rather than a single factor. However, the finding differs slightly from that of Alam et al. (2025), who reported higher levels of school effectiveness in institutions with stronger leadership support and greater teacher autonomy. The disparity may be connected to contextual differences between the educational environments studied and the resource realities of public secondary schools in Kwara State.

The findings from hypothesis one showed a significant relationship between teachers' online communication and interaction skills and the effectiveness of Kwara State senior secondary schools. This implies that teachers who communicate effectively with students through online platforms contribute positively to instructional delivery, learner participation, and overall school performance. This finding corroborates the studies of Archambault et al. (2022) and Carroll et al. (2021), who established that effective online interaction enhances learner engagement, collaboration, and academic participation. Similarly, the finding supports Ayankojo's (2023) work, which found that digital communication strategies improved students' engagement and learning outcomes in Nigerian secondary schools. The finding also aligns with Rahimi and Oh (2024), who argued that effective communication remains central to successful digital pedagogy in contemporary education. Nevertheless, this result differs from the findings of Yidana et al. (2023), who reported that poor internet connectivity and limited digital infrastructure undermined the effectiveness of online interaction in many

African schools. The difference may be explained by variations in institutional support systems and teachers' adaptability across regions. The findings also revealed a significant relationship between teachers' online assessment and feedback skills and secondary school effectiveness. This suggests that teachers who effectively utilise digital assessment tools and provide timely online feedback contribute to improved academic monitoring, transparency, and school performance. The finding is in agreement with Ahmed and Shittu (2024), who found that reliable online assessment practices improve instructional quality and learning outcomes. The result also supports Rapanta et al. (2020), who observed that effective digital feedback strengthens teacher presence and student motivation in online learning environments. In the Nigerian context, the finding is consistent with Akinlade et al. (2025), who found that teachers' digital competencies positively influence instructional effectiveness and student achievement. However, the finding contrasts with Onyema (2020), who reported that many Nigerian teachers experienced difficulties in implementing digital assessments due to limited technical skills and poor technological facilities. The variation may be associated with differences in teachers' exposure to digital tools and institutional readiness for technology integration.

Furthermore, the study established a significant relationship between teachers' digital content creation skills and school effectiveness in Kwara State senior secondary schools. This indicates that teachers who can design digital instructional materials and innovative learning resources contribute meaningfully to effective teaching and school improvement. This finding supports the studies of Carroll et al. (2021) and Cao et al. (2023), who found that digital instructional materials enhance learner engagement, understanding, and academic performance. The result is also consistent with Mormah and Bassey (2021), who argued that teachers' ability to create digital content is essential for improving instructional quality in the 21st-century classroom. Similarly, Salami and Spangenberg (2024) reported that digital learning resources positively influence students' learning outcomes and school performance. However, the finding differs from Oshowole (2024), who found that inadequate technological infrastructure and lack of technical support significantly limit teachers' ability to create and use digital instructional materials effectively in Nigerian schools. The difference may be due to disparities in access to ICT facilities and institutional commitment to teacher digital development. Overall, the findings of this study demonstrate that teachers' online teaching skills play a significant role in enhancing school effectiveness in public senior secondary schools in Kwara State. The study confirms the growing relevance of digital pedagogy in contemporary secondary education. It reinforces the argument of Mulenga and Shilongo (2025) and Saxena (2025) that the future of effective education increasingly depends on teachers' technological competence and ability to adapt to digitally driven instructional environments.

Conclusion

This study examined the relationship between teachers' online teaching skills and school effectiveness in public senior secondary schools in Kwara State, Nigeria. The study specifically investigated the extent to which online communication and interaction skills, online assessment and feedback skills, Learning Management System (LMS) utilisation skills, and digital content creation skills influence the effectiveness of secondary schools. The findings revealed that teachers' online teaching skills in Kwara State senior secondary schools were generally moderate, while the level of school effectiveness was also moderate. The study further established significant relationships between teachers' online communication and interaction skills, online assessment and feedback skills, and digital content creation skills and secondary school effectiveness.

These findings imply that teachers' online teaching competencies have become important determinants of effective school functioning in the contemporary digital learning environment. Teachers who possess adequate online teaching skills are better positioned to enhance instructional delivery, improve student engagement, strengthen assessment practices, and support effective school administration. The findings therefore confirm that

digital competence is no longer optional in secondary education but a requirement for achieving sustainable educational effectiveness in the 21st century. The study concludes that improving teachers' online teaching skills would significantly enhance school effectiveness in public senior secondary schools in Kwara State. Consequently, educational stakeholders, government agencies, and school administrators should prioritise continuous professional development, the provision of digital infrastructure, and policy support to strengthen teachers' online instructional competencies. This would not only improve the quality of teaching and learning but also enhance the overall performance and adaptability of secondary schools in an increasingly technology-driven educational system.

Ucapan Terima Kasih

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