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Nigerian Secondary School Teachers' Awareness of and Readiness to Utilize Cloud Computing in the Classroom in a Selected Local Government Area

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Abstract

This study examines secondary school teachers' awareness of and readiness to use cloud computing for teaching in Lagos State, Nigeria. A descriptive survey research design was employed, utilizing a structured questionnaire to gather data. The respondents were 240 secondary school teachers selected into the study based on gender and years of experience. Data were analyzed using frequency counts, mean scores, percentages, t-test and ANOVA. The results revealed that secondary school teachers were moderately aware of the use of cloud computing technologies for teaching, and have a positive inclination towards adopting digital tools to enhance education. In terms of teaching experience and among different groups of teachers, the results showed no significant differences between secondary school teachers in regard to their awareness of and readiness to use cloud computing for teaching. Based on these results, the study recommends that educational institutions and policymakers develop and implement comprehensive training programs to help teachers adopt cloud computing. These training programs should focus on both the theoretical aspects of cloud computing and its practical applications in the classroom.

Keywords: *cloud computing, awareness, readiness, secondary school teachers, teaching experience*

INTRODUCTION

The constant evolution of technology, pedagogical innovations, and societal changes have transformed the educational landscape, with technological tools, online learning, and blended learning playing crucial roles. In the Nigerian context, these tools are reshaping teaching and learning experiences and expanding access to education. According to UNESCO (2015), education fosters societal development through skill acquisition and intellectual advancement. Today, technology has become central to achieving these goals, with cloud computing emerging as a transformative technological tool. Allen and Seaman (2020) highlighted the undeniable impact of technology in global education, including Nigeria, where increasing digital access is creating new opportunities for learners and educators.

Cloud computing, a major innovation in education, provides scalable infrastructure, improves accessibility, and supports flexible, personalized learning environments (Deepal Agrawal et al., 2023). In Nigeria, where resource limitations often restrict educational access, cloud computing offers cost-effective solutions that can bridge gaps in infrastructure and promote equity in education. Through online learning and blended learning, Nigerian students can access educational resources beyond traditional classrooms. As noted by Johnson et al. (2021), digital platforms and internet-enabled devices have eliminated geographical barriers, enabling students to engage in remote learning, a critical advancement for underserved and rural communities. Blended learning, which combines face-to-face and virtual instruction, has also gained traction, provided flexibility and promoted student autonomy.

Technological tools like virtual reality, simulations, and multimedia platforms enhance student engagement and facilitate deeper understanding (Wu & Liu, 2023). In the Nigerian secondary education context, these tools, supported by cloud computing infrastructure, can deliver interactive and adaptive learning experiences that cater to diverse learning styles. Cloud computing further empowers teachers by providing access to shared resources, enhancing collaboration, and simplifying administrative processes (Li, 2023). Platforms such as Microsoft 365 and Google Workspace, already used in Nigerian schools, promote real-time collaboration and resource sharing among educators and students.

However, the effective integration of cloud computing, online learning, and blended learning in Nigeria requires increased teacher awareness and readiness. Albayrak et al. (2020) and Bartoszuk et al. (2021) emphasized that training, professional development, and institutional support are key to equipping teachers with the necessary skills to leverage cloud-based tools effectively.

Furthermore, Nigerian secondary schools must address infrastructural challenges, data security, and privacy concerns associated with cloud computing (Barajas et al., 2020). Careful consideration of deployment models such as public, private, or hybrid clouds is essential to meet specific institutional needs while ensuring cost-effectiveness and security (Gartner, 2022; IDC, 2021).

In conclusion, cloud computing, alongside technological tools, online learning, and blended learning, holds immense potential to transform Nigerian secondary education. By prioritizing teacher training, improving infrastructure, and promoting awareness, Nigeria can harness these innovations to improve access, enhance teaching and learning outcomes, and prepare students for success in the 21st century.

Problem Statement

The integration of technology, particularly cloud computing, holds significant potential for enhancing teaching and learning experiences in secondary schools. In Nigeria, and specifically in Lagos State, cloud computing is gaining recognition for its ability to improve access to educational resources, promote collaboration, and support personalized learning. However, despite these opportunities, the practical adoption and effective utilization of cloud computing by secondary school teachers remain limited. Evidence from recent studies (Ogunleye & Ojo, 2019; Okeke & Onyeka, 2022; Okoro & Igwe, 2024) highlights that while awareness of cloud computing among teachers in Lagos State exists at a moderate level, this awareness does not consistently translate into readiness or effective classroom integration. This discrepancy suggests a persistent gap between knowledge and practice**,** which may hinder the full realization of the educational benefits that cloud computing offers.

The results of this study further confirm that although teachers generally exhibit a positive inclination toward adopting digital tools**,** their level of awareness and readiness to utilize cloud computing remains only moderate. More importantly, statistical analysis revealed no significant differences in awareness or readiness based on years of teaching experience or area of specialization**,** indicating that the challenge is widespread across teacher demographics in Lagos State. This raise concerns that despite the growing accessibility and promotion of cloud-based technologies in education**,** many teachers still lack the necessary training, technical confidence, and practical support to integrate these tools effectively into their teaching practices. Furthermore, the availability of infrastructure to support cloud computing in Lagos secondary schools was not the primary focus of previous studies, leaving an incomplete understanding of the broader conditions influencing adoption.

Thus, there exists a clear research gap in understanding not only the levels of teacher awareness and readiness but also the underlying factors that may influence or inhibit effective adoption of cloud computing in Lagos State secondary schools. Addressing this gap is critical to ensuring that teachers are adequately prepared to leverage cloud-based resources to improve teaching outcomes, enhance student engagement, and align with global best practices in 21st-century education.

OBJECTIVES OF THE STUDY

The main purpose of this study was to examine Nigerian secondary school teachers' awareness of cloud computing and their readiness to utilize in the classroom in a selected local government area in Lagos, Nigeria. Specifically, the study:

1. determined the level of awareness of secondary school teachers in using cloud computing technologies in the classroom;
2. assessed how prepared secondary school teachers were to use cloud computing in the classroom;
3. examined how experienced and less experienced secondary school teachers differ in their awareness of using cloud computing for instruction;
4. looked into how a teacher's area of expertise affected their readiness to use cloud computing technologies for instruction;
5. found out how experienced and less experienced secondary school teachers differ in their readiness to use cloud computing for instruction;
6. examined how different Arts, Science, and Commercial teachers are in their awareness of using cloud computing for instruction;

Research Hypotheses

Based on the research questions, the following hypotheses were tested in the study:

Ho_1: There is no significant difference between experienced and less experienced secondary school teachers' awareness on the use of cloud computing for teaching.

Ho_2: There is no significant difference between Secondary School Arts, Science, and Commercial teachers' awareness of the use of cloud computing for teaching.

Ho_3: There is no significant difference between experienced and less experienced secondary school teachers' readiness to use cloud computing for teaching.

Ho_4: There is no significant difference between Secondary School Arts, Science and Commercial teachers' readiness to use cloud computing for teaching.

Scope of the Study

The awareness and readiness of secondary school teachers in Lagos State to use cloud computing for instruction would be the main emphasis of this study. Teachers from a variety of Lagos State secondary public and private schools will be involved. The purpose of this study was to obtain information about teachers' experiences with cloud computing through the use of random sampling procedures. While several factors may affect instructors' awareness and readiness for using cloud computing, the results of this study only took into account years of experience and area of specialization.

LITERATURE REVIEW

The integration of cloud computing into educational systems has gained considerable traction in recent years, particularly as a response to the demands of 21st-century teaching and learning. Cloud computing refers to the on-demand delivery of computing services such as storage, applications, and processing power via the internet, often described using the "as-a-service" model (Mell & Grance, 2011). In the context of education, this technology presents transformative possibilities by promoting scalable infrastructure, accessibility to digital content, and collaborative instructional environments (Agrawal et al., 2023; Allen & Seaman, 2020).

Theoretical Foundations and Technology Adoption Models

Much of the current literature draws upon foundational models such as the Technology Acceptance Model (TAM; Venkatesh & Davis, 2000) and its later extension, the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2012). These models emphasize perceived usefulness, ease of use, social influence, and facilitating conditions as key drivers of technology adoption. Studies such as those by Smith and Brooks (2020) and Gao et al. (2021) applied these frameworks to assess teachers' willingness to adopt cloud-based technologies in instructional settings. Findings consistently show that professional development, prior exposure, and institutional support are crucial variables influencing readiness and uptake.

Empirical Findings on Awareness and Readiness

Recent studies underscore varying levels of awareness and readiness among teachers globally and across Nigerian contexts. Ogunleye and Ojo (2019), in their Lagos-based study, found that secondary school teachers demonstrated moderate awareness of cloud computing, particularly concerning familiar platforms like Google Drive and Microsoft 365. Similarly, Okeke and Onyeka (2022) revealed that while there is a growing interest among Nigerian educators to explore cloud

technologies, the actual readiness to implement them lags behind due to infrastructural and training gaps.

Conversely, Barajas et al. (2020), in a global review, noted that awareness remains critically low in many developing countries. The study emphasized that lack of exposure and technical support significantly limit educators' confidence in utilizing cloud technologies. This view was reinforced by Maliszewski, Norum, and Gabay (2020), who argued that infrastructural deficiencies often override teachers' willingness to adopt new tools. However, in more urbanized contexts like Lagos State, recent studies (e.g., Okoro & Igwe, 2024) suggest a moderate shift toward digital preparedness, largely due to government and private initiatives introducing basic ICT resources in schools.

Methodological Approaches

Most reviewed studies, including those cited above, adopted quantitative survey designs**,** often employing structured questionnaires to assess teachers' self-reported awareness and readiness. For instance, Ertmer and Ottenbreit-Leftwich (2021) emphasized the importance of assessing not just technical skills, but also pedagogical beliefs and attitudes toward technology. Studies by Fisher et al. (2022) and Bartoszuk et al. (2021) complemented survey methods with inferential statistics like t-tests and ANOVA to explore differences across experience levels, subject specializations, and other demographic factors. These methodologies inform the present study's decision to adopt a similar descriptive survey design, thereby enabling comparability and statistical rigor.

Areas of Agreement and Contention

There is a general consensus that cloud computing holds transformative potential for educational environments, particularly in resource-constrained settings (Li et al., 2023; Wu & Liu, 2023). Researchers agree that awareness and readiness among teachers are foundational to successful technology integration. However, there remains contention regarding the extent to which self-reported awareness translates into actual competence and classroom application. Albayrak et al. (2020) cautioned that institutional culture and school leadership play a mediating role, while Wang and Zhang (2024) emphasized that professional development without contextual relevance often fails to yield long-term results.

Identified Research Gaps and Contribution of the Present Study

Despite growing literature on cloud computing in education, few studies have focused specifically on the intersection of awareness and readiness among Nigerian secondary school teachers**,** especially across disciplinary divides (Arts, Science, and Commercial subjects). Many studies treat these as homogenous groups, failing to explore how specialization and teaching experience influence adoption patterns. Moreover, previous works have not sufficiently examined these dimensions using localized data from specific government areas, such as Ifako-Ijaye in Lagos State. This study fills that gap by offering empirical data on both awareness and readiness while also analyzing differences based on teaching experience and subject specialization.

Additionally, while most existing research assesses general attitudes, this study contributes by identifying the specific platforms and tools (e.g., Google Cloud, Adobe Cloud, Heroku) that teachers are more or less familiar with. Such granular insight provides actionable data for policymakers and institutions seeking to tailor capacity-building programs.

METHODOLOGY

Research Design

This study adopted a descriptive survey research design to investigate the awareness and readiness of secondary school teachers to utilize cloud computing for teaching in Lagos State, Nigeria. The design was considered appropriate as it allows the researcher to collect data from a large population and describe their characteristics regarding cloud computing awareness and readiness without manipulating any variables.

Population and Sample

The target population for the study consisted of all secondary school teachers in Ifako-Ijaye Local Government Area (LGA) of Lagos State. A multi-stage random sampling technique was employed to select the study participants. First, ten secondary schools (both public and private) were randomly selected from the LGA. Subsequently, a total of 240 secondary school teachers were randomly sampled from the selected schools to participate in the study.

Instrument

A structured questionnaire was developed as the instrument for data collection. The questionnaire was divided into three sections:

- Section A gathered demographic information such as gender, years of teaching experience, and area of specialization.
- Section B focused on assessing teachers' awareness of cloud computing for teaching.
- Section C measured teachers' readiness to integrate cloud computing into their teaching practices.

Validity and Reliability

To ensure the validity of the research instrument, the questionnaire was subjected to expert review by three lecturers from the Department of Educational Technology, University of Ilorin. Their feedback informed necessary modifications to enhance the instrument's face and content validity. The reliability was conducted at Ogbomoso, Oyo State involving 37 teachers, who were not part of the population for the study with internal consistency of $\alpha = .82$.

DATA COLLECTION AND ANALYSIS

The researcher obtained ethical clearance and consent from the relevant school authorities before administering the questionnaire. The instrument was distributed and retrieved in person to ensure a high response rate and minimize external influences during completion. The data collected were coded and analysed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics, including means and percentages, were used to summarize the respondents' demographic characteristics and responses to research questions. To test the study's hypotheses, inferential statistics, specifically independent samples t-tests and one-way Analysis of Variance (ANOVA), were employed at a 0.05 level of significance.

RESEARCH ETHICS

This study adhered strictly to ethical standards governing research involving human participants. Prior to data collection, ethical approval was obtained from the Research and Ethics Committee of the University of Ilorin, Nigeria. The purpose, procedures, and potential risks and benefits of the study were clearly explained to all participants.

Informed consent was obtained from each participant. Participation was entirely voluntary, and respondents were informed of their right to decline or withdraw from the study at any stage without any negative consequences. Only teachers who gave explicit consent were included in the study.

To ensure confidentiality and anonymity, no names or identifying information were recorded or linked to individual responses. Data were coded and securely stored in password-protected files accessible only to the research team. The collected information was used solely for academic purposes and presented in aggregate form to prevent traceability to specific individuals or institutions.

The study also complied with data protection and privacy protocols**,** including secure handling, storage, and eventual disposal of data in accordance with institutional and national guidelines. These measures ensured that the rights, dignity, and privacy of all participants were upheld throughout the research process.

RESULTS

The data collected were analysed and the findings were presented based on the specific research purposes and hypotheses. Table 1 shows the distribution of the respondents sampled based on gender. The sample of 240 respondents was predominantly female, comprising 57.1% (137 individuals), with males making up the remaining 42.9% (103 individuals). This gender distribution highlights a slight skew towards females in the survey, providing a sufficient basis for gender-related analysis within the study's scope.

Table 1
Distribution of the Respondents Sampled Based on Gender

Gender	Frequency	%
1. Male	103	42.9%
2. Female	137	57.1%
Total	240	100.0%

Table 2 shows the experience level of the respondents. In a sample of 240 respondents, 67.9% reported having experience, while 32.1% indicated having less experience. This distribution highlights a majority of experienced individuals in the surveyed group, underscoring the potential influence of their perspectives and decisions on the study's outcomes.

Table 2
Distribution of the Respondents Sampled Based on Experience Level

Experience level	Frequency	%
1. Less Experience	77	32.1%
2. Experience	163	67.9%
Total	240	100.0%

Table 3 shows the distribution of respondent on area of specialization. In a sample of 240 respondents, the distribution based on area of specialization shows that Science is the largest group at 40.0% (96 respondents), followed by Art at 37.5% (90 respondents), and Commercial at 22.5% (54 respondents).

Table 3
Distribution of the Respondents Sampled Based on Area of specialization

Area of specialization	Frequency	%
Art	90	37.5
Science	96	40.0
Commercial	54	22.5
Total	240	100.0

Level of Cloud Computing Awareness among Secondary School Teachers in Lagos State

The findings presented in Table 4 assess teachers' awareness across a range of platforms and tools often associated with cloud computing, including Google Cloud, Microsoft Azure, Dropbox, Adobe Cloud, OneDrive, Apple iCloud, AWS, Salesforce, Heroku, and Alibaba Cloud. These tools, although varying in technical complexity and service category (e.g., storage, infrastructure, application platforms), collectively represent the diverse ecosystem of cloud computing technologies accessible in educational environments.

To ensure clarity in interpreting the results, the awareness scale used is defined as follows:

- NA = Not Aware
- SLA = Slightly Aware
- SWA = Somewhat Aware
- MA = Moderately Aware
- EA = Extremely Aware

Table 4
Awareness of Secondary School Teachers on the Use of Cloud Computing Technologies for Teaching

Items	**NA** Frequency %	**SLA** Frequency %	**SWA** Frequency %	**MA** Frequency %	**EA** Frequency %	**Mean**
Google Cloud	40 16.7%	43 17.9%	16 6.7%	55 22.9%	86 35.8%	3.43
Microsoft Azure	44 18.3%	41 17.1%	54 22.5%	79 32.9%	22 9.2%	2.97
Dropbox	47 19.6%	40 16.7%	47 19.6%	53 22.1%	53 22.1%	3.10
Adobe	15	27	41	61	96	3.82

	6.3%	11.3%	17.1%	25.4%	40.0%	
Onedrive	47 19.6%	56 23.3%	45 18.8%	40 16.7%	52 21.7%	2.98
Apple iCloud	15 6.3%	27 11.3%	55 22.9%	60 25.0%	83 34.6%	3.70
AWS	81 33.8%	51 21.3%	52 21.7%	46 19.2%	10 4.2%	2.39
Salesforce	52 21.7%	84 35.0%	48 20.0%	35 14.6%	21 8.8%	2.54
Heroku	90 37.5%	46 19.2%	47 19.6%	40 16.7%	17 7.1%	2.37
Alibaba Cloud	62 25.8%	33 13.8%	33 13.8%	58 24.2%	54 22.5%	3.04
Average mean						3.13

The overall average awareness score obtained was 3.13, which is above the established benchmark mean of 2.50 used in similar educational research (Ogunleye & Ojo, 2019; Okeke & Onyeka, 2022). This benchmark indicates the threshold for acceptable awareness or readiness levels within educational contexts. Scores above 2.50 suggest a satisfactory level of awareness that can be considered adequate for initiating technology-related interventions.

Furthermore, while individual preferences for specific tools may vary (e.g., some teachers may prefer Google Cloud over Apple iCloud or OneDrive over Dropbox), such variations are expected in educational settings where exposure to particular platforms depends on institutional policies, infrastructure availability, and personal experience. Nonetheless, the cumulative awareness captured across these tools provides a valid and meaningful representation of teachers' overall familiarity with cloud computing technologies.

Thus, the mean score of 3.13 demonstrates that teachers possess a moderate and acceptable level of awareness regarding cloud computing technologies, meeting the recognized standard for interpreting readiness to engage with such technologies in educational practice.

Readiness to Use Cloud Computing among Secondary School Teachers in Lago State

Table 5 presents the findings on teachers' readiness to integrate cloud computing into their instructional practices. The readiness scale applied is based on the following categories:

- NR = Not Ready
- SLR = Slightly Ready
- SWR = Somewhat Ready
- MR = Moderately Ready
- ER = Extremely Ready

Table 5
Readiness of Secondary School Teachers Towards Utilization of Cloud Computing for Teaching;

Items	NR Frequency %	SLR Frequency %	SWR Frequency %	MR Frequency %	ER Frequency %	Mean
1) I am eager to train my students the skills of cloud computing	24 10.0%	37 15.4%	40 16.7%	60 25.0%	79 32.9%	3.55
2) I am ready to utilize cloud computing in teaching	7 2.9%	33 13.8%	43 17.9%	84 35.0%	73 30.4%	3.76
3) I am disposed to encourage access of learning content in the cloud for my student	21 8.8%	46 19.2%	63 26.3%	55 22.9%	55 22.9%	3.32
4) I am adequately prepared to utilize cloud computing for teaching.	16 6.7%	33 13.8%	58 24.2%	69 28.8%	64 26.7%	3.55
5) I am ready to upload course material remotely for students provided that there is an internet network	9 3.8%	38 15.8%	50 20.8%	63 26.3%	80 33.3%	3.70
6) I am ready to conduct my continuous assessment to enable critical thinking among my learners	9 3.8%	28 11.7%	58 24.2%	67 27.9%	78 32.5%	3.74
7) I am eager to build a virtual environment for teaching to share new ideas	15 6.3%	29 12.1%	44 18.3%	70 29.2%	82 34.2%	3.73
8) I am willing to incorporate cloud computing technologies into teaching.	20 8.3%	39 16.3%	55 22.9%	67 27.9%	59 24.6%	3.44
9) I am willing to make my teaching methods more attractive by managing educational resources	9 3.8%	28 11.7%	40 16.7%	65 27.1%	98 40.8%	3.90
10) I love to improve the quality of my services in terms of response time	16 6.7%	22 9.2%	31 12.9%	49 20.4%	122 50.8%	4.00
Average mean						3.62

The overall average readiness score was 3.62**,** also well above the benchmark mean of 2.50, indicating a positive and acceptable level of readiness to utilize cloud computing for teaching. This suggests that teachers demonstrate not only a willingness but also a perceived preparedness to adopt cloud-based tools and platforms, which aligns with the growing emphasis on digital integration in education. It is acknowledged that some of the readiness items refer to broader instructional activities that can be implemented with or without cloud computing. However, in the context of this study, such items were

framed to reflect the evolving reality where these teaching activities increasingly leverage cloud-based tools, platforms, and services. Examples include conducting continuous assessments using cloud-hosted platforms, managing educational resources via cloud storage, and improving teaching efficiency through online collaboration all of which are supported or enhanced by cloud computing infrastructure in modern classrooms.

Therefore, when interpreted within the practical realities of technology integration in education, the readiness items collectively offer a reliable measure of teachers' preparedness to adopt cloud computing. The strong average score of 3.62**,** exceeding the 2.50 benchmark, further validates the conclusion that secondary school teachers in Lagos State are ready to utilize cloud-based technologies in their teaching.

Research Hypotheses

H_{O1}**:** There is no significant difference between experienced and less experienced secondary school teachers' awareness on the use of cloud computing for teaching.

Table 6 provides data on the awareness levels of less experienced and experienced secondary school teachers regarding the use of cloud computing for teaching. The independent samples t-test compares the awareness of cloud computing for teaching between less experienced and more experienced secondary school teachers. The mean scores are 3.83 for less experienced teachers and 3.81 for more experienced teachers, with standard deviations of 1.20 and 1.27, respectively. The degrees of freedom (df) is 238, and the significance (Sig) value is 0.90, which is above the 0.05 threshold. This indicates no statistically significant difference in awareness levels between the two groups. Therefore, we conclude that teaching experience does not significantly impact teachers' awareness of cloud computing for teaching.

Table 6
Independent Sampled T-test Showing Significant Difference Between Experienced and Less Experienced Secondary School Teachers' Awareness of the Use of Cloud Computing for Teaching.

Awareness level	N	X	SD	df	T	Sig. (2-tailed)	Decision
1. Less experience	77	3.83	1.20				
				238	124	.90	**Accepted**
2. Experienced	163	3.81	1.27				

Ho_2: There is no significant difference between Secondary School Arts, Science and Commercial teachers' awareness on the use of cloud computing for teaching.

Table 7 shows an ANOVA analysis investigating the Significant Difference between secondary school teachers' awareness on the use of cloud computing for teaching. The ANOVA table evaluates the difference in awareness of cloud computing for teaching among secondary school teachers. The analysis divides the variance into between-groups and within-groups components. The between-groups sum of squares (SS) is 4.201 with 2 degrees of freedom (df), resulting in a mean

square (MS) of 2.10. The within-group SS is 367.73 with 237 df, yielding a mean square of 1.55. The F-statistic is 1.35 with a significance value (Sig.) of 0.26. Since the significance value is greater than the 0.05 threshold, we fail to reject the null hypothesis. This indicates no statistically significant difference in the awareness of cloud computing for teaching among the different groups of teachers. Therefore, the awareness levels are similar regardless of the group.

Table 7

ANOVA Shows a Significant Difference Between Secondary School Teachers Awareness on the Use of Cloud Computing for Teaching.

	Sum of Squares	df	Mean Square	F	Sig.	Decision
Between Groups	4.20	2	2.10	1.35	.26	
Within Groups	367.73	237	1.55			Accepted
Total	371.93	239				

Ho_3: There is no significant difference between experienced and less experienced secondary school teachers' readiness to use cloud computing for teaching.

Table 8

Independent Sampled T-test Showing Significant Difference Between Experienced and Less Experienced Secondary School Teachers' Readiness to Use Cloud Computing for Teaching.

Readiness level	**N**	**X**	**SD**	**df**	**T**	**Sig. (2-tailed)**	**Decision**
1. Less experience	77	3.96	1.09				Accepted
				238	-.29	.77	
2. experience	163	4.01	1.35				

Table 8 presents the independent samples t-test which compares the readiness to use cloud computing for teaching between less experienced and more experienced secondary school teachers. The mean readiness score for less experienced teachers (N=77) is 3.96 with a standard deviation of 1.09, while for experienced teachers (N=163), the mean score is 4.01 with a standard deviation of 1.35. The t-test results show a t-statistic of -0.29 and a significance value (Sig. (2-tailed)) of 0.77. Since the significance value is greater than the 0.05 threshold, we fail to reject the null hypothesis. This indicates no statistically significant difference in the readiness to use cloud computing for teaching between less experienced and more experienced teachers. Thus, teaching experience does not significantly impact the readiness levels of secondary school teachers for using cloud computing in their teaching practices.

Ho_4: There is no significant difference between Secondary School Arts, Science and Commercial teachers' readiness to use cloud computing for teaching.

Table 9
ANOVA Showing a Significant Difference Between Secondary School Teachers' Readiness on the Use of Cloud Computing for Teaching.

	Sum of Squares	df	Mean Square	F	Sig.	Decision
Between Groups	1.61	2	.81	.50	.61	
Within Groups	383.38	237	1.62			Accepted
Total	384.99	239				

Table 9 shows the ANOVA table which examines the differences in readiness to use cloud computing for teaching among secondary school teachers. The between-groups sum of squares (SS) is 1.61 with 2 degrees of freedom (df), resulting in a mean square (MS) of 0.87. The within-group SS is 383.38 with 237 df, yielding a mean square of 1.61. The F-statistic is 0.50 with a significance value (Sig.) of 0.61. Since the significance value is greater than the conventional threshold of 0.05, we fail to reject the null hypothesis. This indicates that there is no statistically significant difference in the readiness to use cloud computing for teaching among the different groups of teachers. Therefore, readiness levels are similar across the various groups.

Summary of Findings

Based on the findings, it could be summarized as follows: (1) Secondary school teachers are moderately aware of the use of cloud computing technologies for teaching; (2) Secondary school teachers have a positive inclination towards adopting digital tools to enhance education; (3) There is no significant difference between experienced and less experienced secondary school teachers' awareness of the use of cloud computing for teaching. (0.902< 0.05); (4)

There is no statistically significant difference in the awareness of cloud computing for teaching among the different groups of teachers. (0.260< 0.05); (5)

There is no significant difference between experienced and less experienced secondary school teachers' readiness of the use of cloud computing for teaching. (0.771 < 0.05); and (6)

There is no statistically significant difference in the readiness of cloud computing for teaching among the different groups of teachers. (0.608< 0.05).

DISCUSSION

School Teachers' Level of Awareness of Cloud Computing Technologies for Teaching

The results revealed that secondary school teachers demonstrated a moderate level of awareness regarding the use of cloud computing for teaching, with an overall mean score of 3.13, which is above the commonly accepted benchmark mean of 2.50 used to indicate an acceptable level of awareness in educational research (Ogunleye & Ojo, 2019; Okeke & Onyeka, 2022). This finding suggests that, to a reasonable extent, teachers are familiar with cloud computing tools relevant to the teaching and learning process. This result aligns with the findings of Johnson et al. (2021) and Wu & Liu (2023), who reported that teachers globally are becoming increasingly aware of the role of cloud computing and other digital platforms in enhancing access to instructional resources. Similarly, Li et al. (2023) emphasized that educators are gradually recognizing the value of cloud-based tools for improving collaboration and instructional efficiency, which complements the moderate awareness level observed among the respondents.

Furthermore, Okoro and Igwe (2024), in their study conducted within Lagos State, also reported that while teachers' awareness of cloud computing is generally positive, variations exist based on exposure to specific tools. This pattern is consistent with the present study, where teachers reported higher awareness of platforms such as Google Cloud, Adobe Cloud, and Apple iCloud, while awareness of more technical platforms like AWS and Heroku was lower. Such variations are expected due to differences in teachers' professional experience, school infrastructure, and personal exposure to these tools.

However, the finding contrasts with Barajas et al. (2020), whose systematic review revealed that in several developing countries, teachers' awareness of cloud computing remains considerably low due to limited access to training and technological infrastructure. The higher awareness level observed in this study may reflect the relatively more urban and technology-inclined setting of Lagos State compared to other regions.

Teachers' Readiness to Use Cloud Computing for Teaching

The results also showed a positive level of readiness among the teachers to adopt cloud computing for teaching, with an overall readiness mean score of 3.62, surpassing the 2.50 benchmark, which is an established indicator of acceptable readiness for technology adoption in education (Ogunleye & Ojo, 2019; Okeke & Onyeka, 2022). This finding is consistent with the work of Ertmer & Ottenbreit-Leftwich (2021) and Smith & Brooks (2020), who observed that despite varying technical expertise, many teachers express willingness to adopt digital tools, provided adequate support and resources are available. The positive readiness identified in this study reflects a similar willingness among secondary school teachers in Lagos State to incorporate cloud-based technologies into their teaching practices.

Additionally, studies such as Bartoszuk et al. (2021) and Fisher et al. (2022) have established that teachers' perceived readiness to utilize cloud computing often precedes actual technical competence, highlighting the importance of capitalizing on this positive disposition through targeted professional development. The readiness reported in this study, therefore, presents an opportunity for stakeholders to build technical skills through training, in line with these recommendations.

Contrastingly, Maliszewski, Norum, and Gabay (2020) found that teachers' readiness to adopt cloud computing varies significantly based on factors such as infrastructural support and prior training opportunities. In some regions, teachers remain hesitant due to perceived technical complexity or lack of institutional backing. Although this study did not directly assess infrastructural availability, the generally positive readiness reported suggests that Lagos teachers are relatively well-positioned to integrate cloud computing, possibly due to increased exposure to digital tools within the state's education sector. It is also noteworthy that, as Albayrak et al. (2020) pointed out, school climate and institutional support play a critical role in determining teachers' readiness for cloud computing adoption. While this study focused on awareness and readiness, the influence of these external factors cannot be ignored and should be explored in future research to complement the current findings.

In summary, the findings of this study largely align with existing literature that reports growing awareness and readiness among teachers toward cloud computing integration in education (Li et al., 2023; Okoro & Igwe, 2024; Wu & Liu, 2023). However, the study also acknowledges contrasting evidence from other regions where low awareness and readiness are still reported, often due to infrastructural limitations (Barajas et al., 2020; Maliszewski et al., 2020). The present study provides empirical support for the notion that Lagos State teachers are reasonably aware of cloud computing and exhibit a positive disposition to adopt it for teaching. Nonetheless, awareness and readiness should not be equated with actual competence in employing these technologies, which remains an area for further investigation and capacity building.

CONCLUSION

The findings of this study revealed that secondary school teachers in Lagos State, Nigeria, possess a moderate level of awareness and a positive level of readiness to utilize cloud computing for teaching, as indicated by mean scores above the acceptable benchmark of 2.50. This reflects that teachers are generally familiar with cloud computing tools and express a willingness to adopt them in their instructional practices. These results provide a foundation for educational stakeholders to introduce targeted professional development programs and technological support to enhance the effective integration of cloud computing in secondary schools.

LIMITATIONS OF THE STUDY

The study has the following shortcomings that are apparent.

1. The study was limited to secondary school teachers in one local government area of Lagos State, which may restrict the generalization of the findings to other regions or states in Nigeria.
2. The study relied on teachers' self-reported awareness and readiness, which may not accurately reflect their actual competence or practical ability to utilize cloud computing tools.
3. The study did not assess infrastructural availability or institutional support, both of which are important factors that influence the successful adoption of cloud computing in teaching.
4. The cross-sectional design of the study captures perceptions at a single point in time and does not account for changes in awareness and readiness over time.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made to enhance the effective integration of cloud computing in secondary school teaching:

1. **Targeted Teacher Training:** Educational authorities and stakeholders should organize continuous professional development programs to deepen teachers' technical competence and practical skills for employing cloud computing tools in classroom instruction.

2. **Institutional Support:** Schools and education policymakers should provide adequate infrastructure, including reliable internet access and cloud-based platforms, to enable teachers to translate their awareness and readiness into practical classroom application.

3. **Awareness Campaigns:** Awareness creation initiatives should be intensified, especially for less familiar but educationally beneficial cloud computing platforms such as AWS, Heroku, and Salesforce, to broaden teachers' knowledge beyond popular consumer-oriented tools.

4. **Monitoring and Evaluation:** Regular assessments should be conducted to monitor the progress of teachers' readiness and actual utilization of cloud computing, ensuring that interventions are evidence-based and responsive to teachers' evolving needs.

SUGGESTIONS FOR FURTHER STUDIES

In light of the limitations of this study, the following suggestions are made for future research:

1. Future studies should be extended to include multiple local government areas or states across Nigeria to enhance the generalizability of the findings.

2. Researchers should investigate teachers' actual technical competence and practical ability to employ cloud computing tools, beyond self-reported awareness and readiness.
3. Further research should examine the availability and accessibility of the necessary infrastructure and institutional support required for effective cloud computing adoption in schools.
4. Longitudinal studies are recommended to track changes in teachers' awareness, readiness, and actual use of cloud computing technologies over time.
5. Future studies could explore how demographic factors such as age, gender, and access to professional development influence teachers' adoption of cloud computing in instructional practices.

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