

SECONDARY SCHOOL TEACHERS' USE OF DIGITAL PEDAGOGICAL TOOLS FOR LANGUAGE LEARNING IN DIVERSE CLASSROOMS IN LAGOS STATE, NIGERIA

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ABSTRACT

This study examines the use of digital pedagogical tools by secondary school teachers to support language learning in diversity-oriented classrooms in Lagos State. The research responds to increasing emphasis on inclusive and multilingual education and the role of digital technologies in promoting interactive, learner-centred instruction. A quantitative survey design was adopted using a structured questionnaire administered to 100 secondary school teachers selected through convenience sampling in Lagos State. The instrument collected data on demographic characteristics, digital tool usage, diversity integration practices, and implementation challenges. Data were analysed using descriptive statistics, Pearson correlation, and Kruskal–Wallis tests to examine usage patterns and differences across teacher attributes. Findings indicate that teachers reported moderate levels of digital tool use in diversity-oriented classrooms. A moderate positive correlation was identified between digital tool usage and diversity integration practices ($r = 0.533$, $p < .001$). Key challenges included large class sizes, inadequate training, limited access to digital devices, and poor internet connectivity. The study highlights the need for targeted professional development and stronger institutional support to enhance the effective integration of digital technologies for inclusive language instruction in Nigerian secondary schools.

Keywords: Digital pedagogical tools, inclusive language education, diversity-oriented classrooms, secondary school teachers in Nigeria.

Introduction

Many Nigerian secondary schools still struggle to use digital tools in everyday teaching because of unreliable electricity, poor internet access, and a lack of functional devices in classrooms (Ekine, Olefolu & Chinwenwaru, 2024; Okenwa-Fadele et al., 2025). As a result, digital education policies and curriculum expectations frequently remain theoretical rather than reflected in real classroom practice, particularly in public and low-resource schools serving diverse learners (Ekine, Olefolu & Chinwenwaru, 2024; Udeze & Adesola, 2024). This demonstrates a fundamental issue within Nigerian secondary education because lack of professional training determines how teachers adopt digital teaching methods (Okenwa-Fadele et al., 2025). Schools and educators lack the abilities required for effective digital tool implementation which would enable them to build inclusive language learning environments that meet multilingual classroom needs (Onyekachi et al., 2019; Udeze & Adesola, 2024). The examination of teacher handling methods to deal with constraints must take place because it reveals actual digital teaching tool potential within the educational system of Nigeria which focuses on serving diverse student populations (Ekine, Olefolu & Chinwenwaru, 2024).

Globally, systematic research shows that digital pedagogical tools, such as mobile apps, online platforms, and multimedia resources can enhance language learning by increasing learner engagement, providing interactive learning experiences, and offering rich linguistic input beyond traditional classroom methods (Husnul Khatimah, 2025; Waringga et al., 2025). The literature review evidence shows that digital technologies enable students to follow customized learning paths which enable them to study vocabulary and reading and writing and communication skills until they reach their desired learning outcomes (Husnul Khatimah, 2025; Waringga et al., 2025). Digital tools enable users to access genuine language resources and work with others through online discussion platforms and Web 2.0 tools which improve language learners' ability to interact and develop social skills (Sarıça, 2025).

Despite evidence from global studies on the benefits of digital tools for language learning, Nigerian secondary schools lack research on how teachers actually use these tools in classrooms. teachers encounter problems because they do not have consistent power supply and they experience poor internet connectivity and they can only access a small number of devices (Okenwa-Fadele et al., 2025; Ekine, Olefolu & Chinwenwaru, 2024). The majority of research in Nigeria examines basic technology applications or postsecondary education while it provides minimal data about how secondary teachers assist students who speak different languages or come from multilingual backgrounds (Ibrahim & Jibia, 2025; Tomi & Gbenga, 2024). There is also no research on the teaching strategies teachers adopt to manage language diversity with digital tools (Adams, Yusuf & Okeke, 2025). The study investigates how Nigerian secondary school teachers use digital tools because there is a research gap between their potential and actual classroom use in resource-constrained environments.

There is gap research on how Nigerian secondary school educators implement digital resources to instruct students who possess different language capabilities (Okenwa-Fadele et al., 2025; Ibrahim & Jibia, 2025). The existing research are yet to investigate the methods teachers use in developing different learning paths for their students while using digital devices to support students who speak multiple languages and need help in diverse classroom settings. The study investigates how teachers use digital tools to solve their educational needs which they face during their classroom work. The analysis uses the Technological Pedagogical and Content Knowledge framework which describes how teachers combine their technology knowledge with teaching methods and subject matter to create effective lessons, and the Universal Design for Learning

framework which focuses on creating instructional methods that accommodate all students including those who speak multiple languages (Rose & Meyer, 2002). This research will offer specific insights about how Nigerian secondary school teachers use digital resources to create language learning methods that support all students while making valuable contributions to academic knowledge.

Objectives of The Study

1. To identify the types of digital pedagogical tools employed by secondary school teachers in Nigeria for language instruction.
2. To examine how teachers integrate digital tools into classroom practices to address linguistic and cultural diversity.
3. To determine the challenges teachers, encounter when using digital tools for diversity-oriented language teaching.
4. To assess the strategies teachers, adopt to overcome challenges in integrating digital tools for inclusive language learning.

Digital Pedagogical Tools in Nigerian Secondary Education

Digital pedagogical tools refer to educational technology resources which educators use to create learning environments that improve their teaching methods and student interactions and student learning activities (Bond et al., 2020; Pikhart & Klimova, 2023). The educational tools in Nigeria consist of mobile applications, web applications, multimedia materials, learning management systems, and online collaboration tools which teachers use to support their teaching and assessment and classroom control (Okenwa-Fadele et al., 2025; Tomi & Gbenga, 2024).

The research studies conducted in Nigeria demonstrate that digital technologies can solve fundamental issues which secondary schools face because they include both large student groups and insufficient teaching resources and student language skills vary (Ekine, Olefolu & Chinwenwaru, 2024; Onyekachi et al., 2019). The online platforms together with multimedia content enable students to access language materials as often as needed which allows them to study at their own pace while developing their literacy and listening and communication abilities in classrooms where teachers cannot deliver personalized teaching (Adams, Yusuf & Okeke, 2025). Properly implemented digital tools in the classroom create an environment which encourages students to learn actively while they work together to learn with their classmates (Okenwa-Fadele et al., 2025; Tomi & Gbenga, 2024).

The effectiveness of digital pedagogical tools in Nigerian secondary schools depends on teachers' digital skills and their teaching methods and the support their schools provide according to research conducted by Ibrahim and Jibia in 2025 and Ekine and his colleagues in 2024. Nigerian studies show that most teachers lack sufficient training to use digital tools for language teaching which decreases their ability to help students who come from multilingual backgrounds or low-resource environments (Onyekachi et al., 2019; Tomi & Gbenga, 2024). The process of implementing digital pedagogical tools into secondary classrooms requires more than technology implementation because it necessitates teachers to prepare their instructional design for effective language learning in Nigerian schools which have limited resources and multiple languages.

Teachers' Digital Competence

Teachers' digital competence includes their knowledge and skills together with their confidence to utilize digital technologies for educational purposes. The study defines digital competence through three core elements which include the ability to operate learning management systems and handle digital documents and search online materials and protect digital user accounts (Aydin, Yildirim and Kus, 2024). Teachers with advanced digital skills can create lessons which

enable students to learn through interactive and adaptable study materials that match their different language learning needs while teachers with basic digital abilities fail to use technology for their teaching needs (Ibrahim and Jibia, 2025; Ekine, Olefolu and Chinwenwaru, 2024). The assessment of teachers' digital competence needs to occur because this process helps researchers understand how digital technologies can enhance Nigerian secondary schools' language learning results.

Teachers' Use of Instructional and Communication Tools

Teachers utilize digital platforms and multimedia resources to improve their classroom teaching and student engagement through their use of instructional and communication tools. (Aydin, Yildirim and Kus, 2024) This includes the operations of preparing presentations, creating videos and audio files, taking notes in digital formats, and using communication apps to connect with students and colleagues. The research shows that when teachers use instructional and communication tools in their teaching students become more engaged and motivated while learning results better when they teach in multilingual classrooms which require customized teaching methods (Okenwa-Fadele et al., 2025; Waringga et al., 2025).

Teachers' Use of Hardware Tools

Teachers' use of hardware tools demonstrates their capacity to manage digital equipment and various classroom tools which include projectors and printers and cameras and external storage devices (Aydin, Yildirim and Kus, 2024). Studies in Nigeria show that teachers face difficulties with technology integration because they lack hardware knowledge and access to equipment when teaching large classes in resource-limited schools (Tomi and Gbenga, 2024; Onyekachi et al., 2019). The study of hardware usage constitutes essential knowledge because it determines how secondary school language classrooms use digital teaching tools.

Teachers' Attitudes Toward Digital Technology

Teachers' technology adoption and digital tool integration practices depend on their technology perception which includes assessment of its practical benefits and its operational simplicity (Davis, 1989; Davis, Bagozzi and Warshaw, 1989). Teachers who perceive digital tools as beneficial for improving student learning and manageable to use are more likely to incorporate them into lessons, while negative attitudes or low confidence hinder technology adoption (Ibrahim and Jibia, 2025). Nigerian secondary school students develop their attitudes towards digital tools based on their previous training experiences, the support they receive from their institutions, and their ability to access necessary infrastructure.

Integration of Digital Tools in Diversity-Oriented Language Learning

The implementation of digital resources into language instruction which focuses on diversity leads to improved student participation and better access to learning materials and better customized educational approaches for various student groups. Teachers use multimedia applications together with online platforms and adaptive software to create personalized student lessons which address their specific linguistic abilities and cognitive development and cultural background (Alimova, 2025; Frontiers, 2025; Waringga et al., 2025). The benefits of the program include improved student engagement, customized learning outcomes through feedback, and various paths for students to work together. The program faces difficulties because of technology access disparities and different teacher skill levels and because it does not fully connect with teaching methods (Tsheko, 2025; Tania, 2025). Digital tools in classroom research demonstrate their ability to enhance vocabulary learning through structured practice and interactive activities which improve results in inclusive language teaching when users implement these tools with deliberate consideration (Alimova, 2025; Waringga et al., 2025).

Methodological Approaches in Previous Studies

Past research about digital tools and their effects on language learning through inclusive methods applied quantitative research methods which used surveys and structured questionnaires to assess how teachers integrated technology and how it affected student learning results (International Journal of Learning, Teaching and Educational Research, 2025; Mdpi, 2025). The digital tool adoption research and teacher behavior studies and student learning engagement research use quantitative methods to generate statistical results which can be applied to larger populations. The research designs do not provide a complete understanding of teachers' experiences and the difficulties they face when using digital tools in their teaching practice. We will use a quantitative survey design because it allows us to study how Nigerian secondary school teachers use digital tools by measuring their usage patterns and their teaching effectiveness, which will help us achieve our research goals through measurable results.

Methodology

Research Design

This study employs a quantitative survey research design to examine Nigerian secondary school teachers' use of digital pedagogical tools for diversity-oriented language learning. This design is appropriate because the study aims to measure observable patterns and relationships across a larger population of teachers, which allows generalizable conclusions about the use of digital tools in multilingual classrooms (Creswell, 2014; Johnson & Christensen, 2019). The survey design directly addresses the research questions by enabling systematic collection of data on the types of digital tools teachers use, how they integrate these tools to address linguistic and cultural diversity, the challenges they face, and the strategies they adopt to overcome these challenges. By quantifying these aspects, the study can objectively evaluate the extent and effectiveness of digital tool usage in relation to teacher competence and attitudes (Aydin, Yildirim & Kus, 2024; Ibrahim & Jibia, 2025).

In line with the Technological Pedagogical and Content Knowledge (TPACK) framework and the Universal Design for Learning (UDL) framework, this study identifies teachers' digital competence and attitudes toward digital technology as the independent variables, as these factors are expected to influence classroom practices. Digital competence is operationalized as teachers' ability to operate instructional software, manage digital devices, and integrate technology into lesson delivery, while attitudes reflect teachers' perceptions of the usefulness and ease of use of digital tools (Mishra & Koehler, 2006; Davis, 1989). The dependent variables are the use of digital pedagogical tools, measured through frequency, variety, and integration into lessons, and the effectiveness of diversity-oriented language teaching, measured by teachers' reported ability to support multilingual learners and implement inclusive strategies (Ekine, Olefolu & Chinwenwaru, 2024; Okenwa-Fadele et al., 2025).

Participants

The study participants were professional teachers currently teaching in secondary schools in Nigeria. A total of 100 teachers were recruited using convenience sampling via online professional teacher forums, following communication with and approval from the forum administrators. Because the sample was not randomly selected, it cannot be considered fully representative of all secondary school teachers in Nigeria, and findings should be interpreted with caution. The sample included teachers from private and public schools

Demographic data collected included gender, age, educational qualifications, years of teaching experience, and primary teaching language. This information was used to explore factors that influence teachers' use of digital pedagogical tools. Ethical approval was obtained from school

owners group admin, and informed consent was collected from all participants. Responses were kept anonymous and participation was voluntary.

Data Collection Techniques and Instruments

Data were collected using a structured questionnaire designed specifically for this study. The questionnaire included four sections: (1) demographic information, (2) teachers' use of digital tools, (3) integration practices for diversity-oriented language teaching, and (4) perceived challenges in using digital tools. The items measuring digital tool use, integration practices, and challenges were developed based on an extensive review of the literature (Ekine, Olefolu & Chinwenwaru, 2024; Aydin, Yildirim & Kus, 2024) and were aligned with the Technological Pedagogical and Content Knowledge (TPACK) framework and the Universal Design for Learning (UDL) framework to ensure construct validity.

Data Analysis Procedures

Collected data were analysed using Microsoft Excel and JASP statistical software. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participant demographics and patterns of digital tool usage, diversity integration practices, and perceived challenges.

Given that Likert-scale responses produce ordinal data and the normality assumption could not be guaranteed, non-parametric tests were employed for inferential analysis. Relationships between variables were examined using Spearman's rank-order correlation, which is appropriate for ordinal data and does not assume normality. Differences in digital tool usage, integration practices, and challenges across groups (e.g., age, years of teaching experience, school type) were analysed using the Kruskal–Wallis H test, with Dunn's post-hoc test and Bonferroni adjustment to identify specific group differences. This approach ensures that statistical conclusions are consistent with the scale type and distribution of the data, providing robust, quantitative insights into the factors influencing teachers' adoption of digital pedagogical tools and supporting evidence-based recommendations for diversity-oriented language teaching (Field, 2018; Pallant, 2020).

Results

Demographic

Table 1: Demographic Profile of Respondents

Gender	Percentage
Female	41.00%
Male	55.00%
Prefer not to say	4.00%
Total	100.00%
Age	
25 - 35 years	25.00%
36 - 45 years	33.00%
46 years and above	8.00%
Below 25	34.00%
Total	100.00%

Education

Bachelor's Degree (B.Ed/B.A/B.Sc)	36.00%
Master's Degree	11.00%
N.C.E	24.00%
Postgraduate Diploma in Education (PGDE)	29.00%
TOTAL	100.00%

Years Of Experience

11 - 15 years	27.00%
5 - 10 years	23.00%
Above 15 years	8.00%
Less than 5 years	42.00%
Total	100.00%

The demographic summary of the data shows a moderately balanced gender composition, with slightly more male participants (55%) than female (41%), a fair representation of gender in the sample. The age composition reveals a young and mid-career teaching population, with the largest share of teachers falling into the below 25 years (34%) and 36-45 years (33%) age groups. The educational attainment analysis shows extensive professional training, with most participants holding at least a bachelor's degree or postgraduate qualification, which is a good measure of professional competency. The preponderance of teachers with less than five years of service (42%) suggests a young teaching population.

Descriptive Analysis of Study Constructs.

Digital Pedagogical Tools Usage.

Table 2: Digital Pedagogical Tools Usage – Item and Composite Statistics

	SD	D	A	SA	MEAN	SD
I regularly use digital tools such as videos, audio recordings, or multimedia resources to teach language skills.	3%	50%	29%	18%	2.62	0.8097
I use online platforms or learning management systems (e.g., Google Classroom, WhatsApp, Zoom) for language instruction.	4%	59%	21%	16%	2.49	0.8062
I use mobile applications or educational software to support vocabulary, grammar, or reading skills.	7%	53%	26%	14%	2.47	0.8180
I integrate digital assessment tools (e.g., online quizzes, interactive tests) to evaluate students' language learning.	10%	57%	24%	9%	2.32	0.7730
AVERAGE					2.475	0.802

The results presented in Table 2 indicate that the level of usage of digital pedagogical tools by secondary school teachers in Nigeria is moderate, with a mean of 2.475 and a standard deviation of 0.802. The least used digital pedagogical tools by the teachers were digital assessment tools such as online quizzes and tests, which had a mean of 2.32, while videos, audio, and multimedia had the highest mean of 2.62. The level of usage of online platforms and mobile applications for teaching languages was moderate, indicating a partial integration of technology into practice by the teachers. Although the teachers seem to realize the significance of digital tools for facilitating the learning of languages, the level of implementation of the tools is low.

Diversity-Oriented Integration Practices.

Table 3: Diversity-Oriented Integration Practices – Item and Composite Statistics

	SD	D	A	SA	MEAN	SD
I use digital tools to present language content in ways that reflect students' cultural backgrounds.	8%	50%	27%	15%	2.49	0.8426
Digital tools help me provide differentiated language instruction for students with varying proficiency levels.	7%	52%	33%	8%	2.42	0.7373
I use digital resources to support students whose first language is different from the language of instruction.	8%	54%	26%	12%	2.42	0.8022
Digital tools enable me to adapt language lessons to meet the needs of learners with different learning abilities.	5%	57%	23%	15%	2.48	0.8060
AVERAGE					2.4525	0.797

The findings in Table 3 suggest that teachers' diversity-oriented integration practices in digital tools are moderate, as indicated by a composite mean of 2.453 (SD = 0.797). Teachers reported a higher level of engagement in diversity-oriented integration practices in digital tools to accommodate learners of diverse abilities (Mean = 2.48) and to respect students' cultural backgrounds (Mean = 2.49). Providing differentiated instruction to accommodate learners of diverse proficiency levels and assisting students whose native language is not the language of instruction were reported at a slightly lower level (Mean = 2.42). The overall findings suggest that, despite teachers' awareness of the value of diversity-oriented digital practices, there is a lack of comprehensive integration, which could be due to possible limitations in training, resources, and/or experiences in inclusive education. This emphasizes the necessity of supporting teachers in enhancing their use of technology in addressing issues of linguistic and cultural diversity in secondary school classrooms.

Perceived Challenges in Digital Integration

Table 4: Challenges in Digital Integration – Item and Composite Statistics

	SD	D	A	SA	MEAN	SD
Limited access to digital devices affects my ability to use digital tools for language teaching.	2%	33%	20%	45%	3.08	0.9239
Poor internet connectivity limits effective use of digital tools in my language classroom.	1%	33%	20%	46%	3.11	0.9044
I lack adequate training to effectively use digital pedagogical tools for language instruction.	2%	24%	25%	49%	3.21	0.8752
Large class size makes it difficult to integrate digital tools for inclusive language learning.	4%	22%	16%	58%	3.28	0.9389
AVERAGE					3.17	0.911

From the results in Table 4, teachers experience major challenges in the integration of technology in language learning, with a composite mean of 3.17 (SD = 0.911). The most notable challenges are those of large class sizes (Mean = 3.28) and lack of training (Mean = 3.21), followed by internet connectivity (Mean = 3.11) and lack of access to technology (Mean = 3.08). This suggests that teachers experience major challenges in the implementation of technology-based, diversity-oriented language learning due to structural, resource, and training challenges. Therefore, teachers in secondary schools in Nigeria require support in overcoming the challenges in order to improve inclusive language learning.

Inferential Analysis of Relationships between Study Variables.

Table 5. Pearson Correlations among Study Variables

Variable 1	Variable 2	Pearson's r	p-value	95% CI (Lower)	95% CI (Upper)	Effect Size (Fisher's z)	SE Effect Size	Significance
Digital Tools Usage	Diversity Integration	0.533	< .001	0.403	1	0.594	0.102	***
Digital Tools Usage	Challenges	-0.197	0.975	-0.351	1	-0.199	0.102	ns
Diversity Integration	Challenges	0.13	0.099	-0.036	1	0.131	0.102	ns

Note:

- ns = not significant ($p > 0.05$)
- *** $p < .001$, one-tailed
- 95% CI = Confidence Interval
- Effect size calculated using Fisher's z
- VS-MPR = Vovk-Sellke Maximum p-Ratio (Sellke, Bayarri, & Berger, 2001)

The Pearson correlation analysis (Table 5) revealed a strong, positive, and statistically significant relationship between digital tools usage and diversity integration among teachers, $r = 0.533$, $p < .001$, indicating that greater use of digital pedagogical tools is associated with more effective

integration of linguistic and cultural diversity in classrooms. In contrast, the correlations between digital tools usage and challenges ($r = -0.197$, $p = 0.975$) and between diversity integration and challenges ($r = 0.130$, $p = 0.099$) were not significant, suggesting that perceived challenges such as limited resources or large class sizes do not systematically relate to teachers' use of digital tools or their diversity-oriented practices. These findings highlight the critical role of digital tools in supporting inclusive language teaching, independent of contextual constraints.

Table 6. Kruskal–Wallis Test Results for Group Differences in Study Variables

Factor	Dependent Variable	H (Chi-Square)	df	p-value	Significance
Age Group	Digital Tools Usage	0.571	3	0.903	ns
Age Group	Diversity				
Age Group	Integration	4.43	3	0.219	ns
Age Group	Challenges	5.902	3	0.116	ns
Years of Teaching Experience	Challenges	3.64	3	0.303	ns
Years of Teaching Experience	Digital Tools Usage	7.809	3	0.05	*
Years of Teaching Experience	Diversity				
Years of Teaching Experience	Integration	15.9	3	0.001	**

Table 7. Post-Hoc Comparisons for Years of Teaching Experience – Digital Tools Usage

Comparison (Years of Experience)	Mean Difference	SE	df	t	p (Tukey)	p (Bonferroni)	Significance
<5 vs 5–10	0.345	0.187	96	1.842	0.26	0.412	ns
<5 vs 11–15	0.495	0.163	96	3.042	0.016	0.018	*
<5 vs >15	0.414	0.254	96	1.626	0.369	0.643	ns
5–10 vs 11–15	-0.264	0.271	96	-0.974	0.765	1	ns
5–10 vs >15	0.15	0.171	96	0.878	0.816	1	ns
11–15 vs >15	0.081	0.265	96	0.305	0.99	1	ns

Table 8. Post-Hoc Comparisons for Years of Teaching Experience – Diversity Integration

Comparison (Years of Experience)	Mean Difference	SE	df	t	p (Tukey)	p (Bonferroni)	Significance
<5 vs 5–10	0.537	0.181	96	2.967	0.02	0.023	*
<5 vs 11–15	0.578	0.157	96	3.676	0.002	0.002	**
<5 vs >15	0.414	0.257	96	1.615	0.375	0.658	ns
5–10 vs 11–15	-0.122	0.262	96	-0.467	0.966	1	ns
5–10 vs >15	0.041	0.165	96	0.25	0.994	1	ns
11–15 vs >15	0.164	0.246	96	0.666	0.91	1	ns

The Kruskal-Wallis tests, as shown in Table 6, were used to investigate differences in digital tools usage, diversity integration, and perceived challenges across age groups and years of teaching experience. It was found that age group did not significantly affect the study variables, as all p-values were higher than 0.05, indicating that teachers' age did not affect digital tools usage ($H =$

0.571, $p = 0.903$), diversity integration ($H = 4.43$, $p = 0.219$), and perceived challenges ($H = 5.902$, $p = 0.116$).

In contrast, years of teaching experience have a significant impact on digital tools usage ($H = 7.809$, $p = 0.05$) and diversity integration ($H = 15.9$, $p = 0.001$). These findings suggest that years of experience influence teachers' use of digital tools and diversity integration. Post-hoc tests were conducted to further examine these findings. For digital tools usage, teachers with less than five years of experience have significantly higher digital tools usage compared to those with 11–15 years of experience (Mean Difference = 0.495, $p = 0.018$). Regarding diversity integration, teachers with less than five years of experience scored higher than those with 5–10 years (Mean Difference = 0.537, $p = 0.023$) and 11–15 years (Mean Difference = 0.578, $p = 0.002$), suggesting that novice teachers are more active in employing digital tools to support linguistic and cultural diversity. Other comparisons did not reach significance.

These findings imply that recently trained teachers are more inclined to adopt contemporary digital pedagogical practices and integrate diversity-oriented strategies, likely reflecting greater exposure to ICT and inclusive teaching approaches during pre-service training. Mid-career and experienced teachers may benefit from targeted professional development to enhance digital engagement and inclusive practices. Overall, the results highlight the need for experience-sensitive support programs to promote equitable adoption of digital pedagogy and effective diversity integration across all levels of teaching experience.

Discussion of Findings

The findings suggest that Nigerian secondary school teachers demonstrate moderate adoption of digital pedagogical tools, which may reflect the gradual integration of technology within resource-constrained educational environments. From a Technology Acceptance Model (TAM) perspective, teachers may perceive audiovisual tools such as videos and multimedia resources as easier to use and more immediately beneficial for classroom engagement compared to more complex digital assessment platforms. The lower use of online quizzes and assessment tools may therefore indicate perceived technical difficulty, limited training, or insufficient institutional support rather than lack of interest in innovation.

The moderate implementation of diversity-oriented instructional strategies can be interpreted through inclusive education and culturally responsive teaching frameworks, which emphasise adapting content to learners' cultural and cognitive needs. Teachers' stronger focus on cultural and ability-based adaptation rather than linguistic differentiation may reflect contextual realities within Nigerian classrooms, where large class sizes and limited specialist training constrain individualized language scaffolding. These findings suggest that teachers are attempting inclusive practices within existing structural limitations rather than fully implementing comprehensive diversity-focused pedagogy.

The positive association between digital tool usage and diversity integration may indicate that technology provides flexible pathways for differentiated instruction, enabling teachers to present content in multiple formats. However, given the cross-sectional and correlational nature of the data, this relationship cannot be interpreted as causal. It is equally plausible that teachers who are already motivated toward inclusive practices are more inclined to adopt digital tools. The absence of a significant statistical relationship between perceived challenges and technology use may also reflect self-selection bias within the convenience sample, where digitally confident teachers were more likely to participate in an online survey.

Differences based on teaching experience suggest that early-career teachers may be more exposed to recent ICT-focused teacher education and inclusive pedagogy training, supporting

theories of generational digital competence. Conversely, more experienced teachers may rely on established pedagogical routines shaped by long-standing institutional cultures. However, these interpretations should remain tentative because the study did not directly measure training quality, digital literacy levels, or institutional policy contexts.

Importantly, several methodological limitations affect the interpretation of findings. The use of convenience sampling through online teacher forums limits the representativeness of the sample and restricts generalisation to all Nigerian secondary school teachers. Data were collected through self-reported questionnaires, which may be influenced by social desirability bias and subjective interpretation of digital competence and inclusivity practices. Additionally, the cross-sectional survey design captures perceptions at a single point in time and does not allow causal conclusions about the impact of digital tools on diversity-oriented teaching outcomes. Measurement constraints, including reliance on Likert-scale responses, also limit the depth of behavioural insights.

Overall, the findings contribute exploratory quantitative evidence on the intersection between digital pedagogy and diversity-focused language instruction within a developing educational context. Rather than demonstrating definitive effectiveness, the results highlight patterns of partial adoption shaped by training exposure, institutional constraints, and contextual teaching realities. Future research using mixed methods, classroom observations, and more representative sampling would provide deeper insight into how digital pedagogical tools influence inclusive language learning practices in Nigerian secondary schools.

Conclusion

This study examined the use of digital pedagogical tools among Nigerian secondary school teachers in diversity-oriented language teaching contexts. The findings indicate a moderate level of digital tool usage, with multimedia resources such as videos and audio recordings reported more frequently than online assessment tools. Teachers also reported moderate implementation of diversity-oriented strategies, particularly in adapting lessons to students' cultural backgrounds and learning abilities, while linguistic adaptation was less emphasised. A positive association was identified between digital tool usage and diversity-focused instructional practices; however, the cross-sectional survey design does not allow causal conclusions. Group differences suggested some variation based on teaching experience, although age showed limited influence. Reported challenges included large class sizes, limited training, and restricted access to digital infrastructure. Given the convenience sampling method and self-reported questionnaire, the findings should be interpreted cautiously and cannot be generalised to all Nigerian secondary school teachers. Overall, the study provides exploratory quantitative insights into patterns of digital pedagogical practices in diversity-oriented language teaching and highlights areas for further, more representative research.

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