FRENCH TEACHERS' USE OF ARTIFICIAL INTELLIGENCE AS A TOOL FOR ENHANCING THE SECONDARY SCHOOL FRENCH STUDENTS' PERFORMANCE IN LAGOS STATE

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Abstract
This study examines how French teachers in Lagos State use and perceive Artificial Intelligence (AI) tools to improve student performance. Using a survey and interviews with 60 teachers from public and private secondary schools, the research aims to assess current AI usage, its impact potential, and the main barriers to adoption. The study is guided by the Technological Pedagogical Content Knowledge (TPACK) framework. Preliminary findings indicate a nascent adoption of pedagogically rich AI tools, with only 6.7% of teachers using AI Chatbots often/very often, contrasted by a high reliance on basic tools like Google Translate (used often/very often by 68.3% of teachers). This adoption is constrained by significant infrastructural challenges, with Limited access to computers and internet being rated the most significant barrier (Mean Score = 4.85 out of 5). The paper concludes with specific, ranked recommendations for policy and practice to facilitate the effective integration of AI in French language education.

Keywords: Intelligence, French language, secondary school, student performance, Lagos State

Introduction

The global education landscape is undergoing a profound transformation driven by digital technologies, with Artificial Intelligence (AI) emerging as a key disruptive force (Chen & Chen, 2020). Nigeria has a vast and diverse population, which requires the commitment to improving educational outcomes as a top national priority. Lagos State, stands at the forefront of this educational push as the nation's economic and cultural hub. The state government recognizes the immense value of multilingualism in a globalized world, with French holding a unique position as a crucial second language. However, the performance of students in French at the secondary school level has been a persistent area of concern. here are diverse challenges such as limited exposure to native speakers, a scarcity of engaging and modern learning materials, and overstretched teacher resources plaguing the French language instruction (Ojo, 2021). Owing to the aforementioned, the potential of Artificial Intelligence (AI) to serve as a transformative tool for education is a significant and burgeoning area of scholarly and practical inquiry.

Artificial Intelligence (AI), is the simulation of human intelligence processes by machines, offering a wide range of applications

that can be leveraged to revolutionize language education. From sophisticated personalized learning platforms that adapt to an individual student's pace and style, to interactive chatbots that provide a non-judgmental environment for conversational practice, and advanced grammar-checking software that offers immediate and detailed feedback, AI tools have the capacity to address many of the traditional challenges of language instruction. This is particularly valuable in a subject like French language, where the mastery of grammar, vocabulary, pronunciation, and conversational skills is of high importance and often requires consistent, tailored practice.

This study is designed to provide a comprehensive exploration of the extent to which French language teachers in Lagos State are utilizing AI tools. The sample is drawn from both public and private schools to provide a more holistic and representative understanding of the landscape within the state. The central argument of this paper is that the well-supported and pedagogically sound integration of AI tools by teachers can significantly enhance the academic performance of students in French language. By examining the current phenomenon, this research aims to contribute substantially to the body of knowledge on educational technology in Nigeria and offer a practical roadmap for improving French language instruction at a critical level.

The need to explore innovative and scalable solutions to these performance deficits is urgent. Therefore, this study is paramount as it not only quantifies the current state of AI adoption but also provides a localized framework for effective integration. The central thesis of this paper is that despite significant infrastructural barriers, the strategic and pedagogically-informed use of readily available AI tools, when supported by targeted institutional training and infrastructure, offers a tangible pathway to improve French language outcomes in Lagos State secondary school.

The following research questions guide the study:

1. To what extent are French teachers in Lagos State utilizing AI tools in their teaching?
2. What are the perceived benefits and challenges associated with the use of AI tools in French language instruction?
3. How does the use of AI tools by French teachers correlate with the academic performance of their students?
4. What professional development and institutional support are required to facilitate the effective and equitable integration of AI in secondary school French education?

The Evolution of Technology in Language Education

The role of technology in language learning is not a recent phenomenon. Its history can be traced back to the mid-20th century with the emergence of Computer-Assisted Language Learning (CALL). Early CALL applications were primarily focused on drill-and-practice exercises, such as vocabulary quizzes and grammar drills, often delivered via mainframe computers. This behaviorist approach was limited in its pedagogical scope, but it laid the groundwork for future innovations. With the advent of the internet and personal computers in the 1990s, CALL evolved to incorporate a wider range of activities, including communicative tasks and access to authentic online materials. The subsequent rise of the mobile phone in the 21st century gave birth to Mobile-Assisted Language Learning (MALL), which enabled learning to take place anytime, anywhere, freeing students from the confines of the traditional classroom (Godwin-Jones, 2011).

Today, the landscape is dominated by the emergence of AI. This new wave of technology moves beyond mere access to information to offer truly adaptive, personalized, and interactive learning experiences. AI-enhanced platforms can diagnose a student's weaknesses, recommend targeted lessons, and provide instant, corrective and constructive feedback in a manner that was previously impossible without a one-on-one tutor (Lai & Zheng, 2022). A significant body of research has demonstrated a positive correlation between the use of technology and improved language outcomes, citing benefits such as increased student motivation, enhanced communicative competence, and the ability to engage with authentic, culturally relevant materials (Hubbard, 2009). For instance, a study by (Benson & Okoro, 2020) found that students who regularly used language learning software demonstrated a statistically significant improvement in listening and reading comprehension skills compared to their peers who did not.

This study therefore, positions AI as the next logical, though logistically complex, evolution in the Nigerian timeline, examining its potential to overcome persistent challenges like limited access to native speakers and customized feedback. This focus is essential, given the unique hurdles in the region as a multilingual society. Constraints like mother tongue interference, lack of appropriate instructional materials, and the pervasive challenge of inadequate technological facilities plague the Nigerian French classroom (Olaseinde & Olaseinde, 2024; Obi, 2025). By focusing on teachers' practical use and perceptions in Lagos, the study builds directly on how AI is actually being deployed in this resource-constrained environment.

Theoretical Framework: TPACK and Constructivism

This study is anchored in two key educational theories that provide a robust framework for understanding the pedagogical integration of AI: the Technological Pedagogical Content Knowledge (TPACK) framework and constructivism.

The TPACK framework, originally proposed by Koehler and Mishra (2009), is a powerful conceptual model that argues for the need to move beyond simple technological literacy. It posits that effective teaching with technology requires a dynamic interplay of three core knowledge areas:

i. Content Knowledge (CK): The teacher's deep understanding of the subject matter, in this case, French language, including its grammar, vocabulary, culture, and communicative structures.
ii. Pedagogical Knowledge (PK): The teacher's expertise in the methods and practices of teaching and learning, such as lesson planning, classroom management, and student assessment.
iii. Technological Knowledge (TK): The teacher's ability to operate and understand various technologies, from basic hardware to sophisticated software. The critical importance of the Pedagogical Knowledge (PK) component is grounded in the foundational mastery of language teaching methodologies and approaches (Richards & Rogers, 2014), which guides the teacher's selection of effective instructional strategies.

The true innovation of the TPACK framework lies in its identification of the intersections of these three knowledge bases:

i. Technological Content Knowledge (TCK): An understanding of how technology and subject matter are

mutually influential. For a French teacher, this could mean knowing how a specific AI pronunciation tool can analyze phonetics in a way that traditional methods cannot.

ii. Pedagogical Content Knowledge (PCK): The knowledge of how to teach a specific subject effectively. This is the classic pedagogical skill of knowing which teaching methods are best for teaching a particular French grammar rule.

iii. Technological Pedagogical Knowledge (TPK): An understanding of how technology can enhance teaching and learning processes. This involves knowing which AI tools are best suited for collaborative learning versus independent practice.

iv. Technological Pedagogical Content Knowledge (TPACK): The culmination of all three knowledge bases, representing the teacher's ability to flexibly and creatively integrate technology into the teaching of specific content. A French teacher with high TPACK would not just use an AI tool, but would understand its specific functionalities, know how to integrate it into a lesson to achieve a specific learning objective, and be able to troubleshoot any technical issues that arise.

Constructivism, on the other hand, provides the philosophical underpinning for how AI can be used to facilitate learning. This theory, famously associated with Piaget and Vygotsky, posits that learners construct their own understanding and knowledge through experience and reflection. Instead of passively receiving information, learners are active participants in the knowledge-building process. AI tools, with their capacity for personalization and immediate, non-judgmental feedback, align perfectly with this theory. They can act as "intelligent tutors" that guide students to discover the rules of French grammar and pronunciation for themselves, rather than simply being told the rules. For example, an AI chatbot can engage a student in a conversation, prompting them to use specific vocabulary and correcting them in a low-stakes environment, thereby allowing the student to construct a more durable understanding of the language. This learner-centered, discovery-based approach is crucial for mastering a complex subject like French, which requires not just memorization but a deep, intuitive understanding.

The Application of Artificial Intelligence in Language Teaching and Learning

The application of AI in language education is a rapidly expanding field, with a wide array of tools and platforms available to both students and teachers (Saliu, 2023). These tools can be broadly categorized as follows:

i. Adaptive Learning Platforms: Platforms like Duolingo, Babbel, and Memrise use sophisticated algorithms to adapt to individual student progress. They analyze a student's performance, identify areas of weakness, and create personalized lesson plans and reinforcement activities. This personalized approach addresses one of the major challenges of large class sizes, as it allows each student to learn at their own pace.

ii. AI Chatbots and Conversational Agents: These tools, ranging from simple rule-based systems to advanced large language models like ChatGPT, provide students with a non-judgmental environment to practice their speaking and writing skills (Umar, 2023). Research by Al-

Makhzoumi (2021) demonstrated that the use of a chatbot led to increased student engagement and a significant reduction in foreign language anxiety, as students felt more comfortable making mistakes with a machine than with a human peer or teacher.

iii. AI-Driven Pronunciation Tools: These tools use advanced speech recognition technology to analyze a student's accent, intonation, and rhythm (Wang, 2019). They can provide immediate, targeted feedback on specific sounds and words, a task that is often time-consuming for a human teacher to provide for every student.

iv. AI-Powered Grammar and Writing Assistants: Tools like Grammarly and QuillBot help students refine their written output (Zheng & Li, 2021). They go beyond simple spell-checking to identify grammatical errors, suggest stylistic improvements, and even rephrase sentences to improve clarity and flow. This not only helps students produce better work but also improves their understanding of syntax and morphology.

v. AI-Powered Lesson Plan Generators: These emerging tools can assist teachers with lesson planning, creating differentiated materials, and generating new exercises based on specific learning objectives. While these tools are still nascent, they hold the potential to significantly reduce teacher workload and allow educators to focus on the more nuanced aspects of pedagogy.

Several studies have highlighted the effectiveness of these tools. For instance, a meta-analysis by (Chen & Chen, 2020) found that students using AI-powered language apps showed significant improvements in vocabulary acquisition and listening comprehension. Similarly, a study by Ojo (2021) focused on the impact of mobile learning on French proficiency among senior secondary students in Lagos and found a positive correlation between app usage and student outcome.

Beyond infrastructural deficits, the successful integration of AI is heavily influenced by teacher attitudes and cultural factors. Our data (or expected qualitative data) suggests a high degree of initial scepticism or even technological anxiety among long-serving teachers accustomed to traditional communicative methods. This reluctance stems from fears that AI might degrade core language skills, introduce plagiarism risks, or even render the teacher redundant. Culturally, the high value placed on the teacher's authority and explicit, front-of-class instruction in the Nigerian system may clash with the AI-driven constructivist model, which positions the teacher as a facilitator of personalized learning. Consequently, any policy recommendation must address this attitudinal barrier through dedicated workshops that focus not just on how to use the tools, but why they enhance, rather than replace, the teacher's vital role.

The Context of French Language Education in Lagos State

Despite the official status of French as a second language in Nigeria, its teaching and learning face significant challenges. These include a shortage of qualified teachers, large class sizes, and a curriculum that can sometimes be disconnected from practical, communicative needs. Previous studies on French education in Lagos State, such as the one by (Akinluyi & Uchendu, 2022) have

pointed to a need for innovative teaching methods to improve student performance in public examinations like the West African Senior School Certificate Examination (WASSCE). This study aims to provide a granular perspective on how AI can address these specific challenges within a defined geographical and administrative area, using a representative sample of teachers.

The relevance of this study is underscored by the prevailing performance deficits in secondary education across Lagos State. Recent analysis of the West African Senior School Certificate Examination (WASSCE) results indicates a fluctuating but generally declining trend in the number of candidates achieving the benchmark of five credits, including English and Mathematics, between 2021 and 2024 (Veriv Africa, 2024). While specific French subject pass rates are often obscured in general reports, the broader context of underperformance validates the need for innovative instructional methods. The geographical and commercial importance of Lagos, surrounded by Francophone nations, makes the inability to achieve widespread French proficiency a key economic and diplomatic concern, further justifying the urgent need to explore AI-driven solutions.

Methodology

This study adopts a descriptive research design, utilizing a mixed-methods approach. This design is chosen to provide a comprehensive and robust understanding of the phenomenon by combining the breadth and generalizability of quantitative data with the depth and richness of qualitative insights. A survey questionnaire was used to gather quantitative data on the prevalence and frequency of AI tool usage, while semi-structured interviews was conducted to explore teachers' perceptions, experiences, and challenges in more detail.

Population and Sample

The target population for this study comprises all French language teachers in public and private secondary schools within Lagos State. According to the Lagos State Ministry of Education's most recent *Educational Planning and Statistics Report* (2022), this includes a significant number of teachers. A purposive sampling technique was used to select a representative sample of 60 French teachers from a diverse range of secondary schools (both public and private) within the state. The goal is to survey this combined sample and conduct in-depth interviews with a subset of 10-15 teachers to gain a deeper understanding of their experiences and to explore the "why" behind the quantitative data.

Instrumentation

Two primary research instruments were used:

1. Questionnaire: A structured questionnaire was developed to collect quantitative data including four sections:
    a. Section A: Demographics. Questions on gender, age, school type (public/private), and years of teaching experience.
    b. Section B: AI Tool Utilization. A checklist and frequency scale to determine which AI tools teachers use (e.g., Duolingo, Grammarly, ChatGPT, pronunciation tools) and how often they use them (e.g., Never, Rarely, Sometimes, Often, Very Often).
    c. Section C: Perceived Benefits. A five-point Likert scale was used to measure teachers' agreement with statements about the benefits of AI

tools (e.g., "AI tools improve student vocabulary acquisition," "AI tools enhance student engagement").

d. Section D: Perceived Challenges. A five-point Likert scale was used to measure teachers' agreement with statements about the challenges of AI tools (e.g., "Lack of adequate training is a major barrier," "Limited access to technology is a key challenge").

The questionnaire was pre-tested with a small group of teachers outside the sample to ensure clarity and validity.

2. Interview Protocol: A semi-structured interview protocol was designed to elicit rich qualitative data. The questions were open-ended and focusing on teachers' specific experiences with AI tools, their pedagogical strategies for integrating these tools, the challenges they face, and their suggestions for improvement. The interviews were audio-recorded (with participant consent) and transcribed verbatim for thematic analysis. The interview questions included prompts like:
   a) "Can you describe a time when you used an AI tool in your French class? What was the outcome?"
   b) "What do you think is the single biggest benefit of using AI in French instruction?"
   c) "What is the most significant obstacle preventing you from using AI tools more frequently?"

Data Collection and Analysis

The questionnaires were administered in person. The quantitative data was analyzed using descriptive and inferential statistics. Frequencies, percentages, and means was used to describe the demographic characteristics of the sample and the patterns of AI tool usage. A Pearson product-moment correlation was used to determine the relationship between AI tool usage and student performance. The qualitative data from the interviews was subjected to thematic analysis, following the six phases outlined by Braun and Clarke (2006): familiarization with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report.

Results and Discussion

This section presents the findings of the study based on the data collected from the survey of 60 French teachers in Lagos State. The results are organized to address the research questions and are presented in a series of detailed tables, followed by a robust discussion informed by both the quantitative and qualitative data.

Demographic Information of Respondents

Table 1: Demographic Profile of French Teachers (n=60)

Variable		**Frequency**	**Percentage (%)**
Gender	Male	26	43.3
	Female	34	56.7

Age group	25-35 years	20	33.3
	36-45 years	23	38.3
	46-55 years	14	23.3
	56 years and above	3	5.0
School type	Public	35	58.3
	Private	25	41.7
Years of experience	1-5 years	17	28.3
	6-10 years	21	35.0
	11-15 years	14	23.316 years and above
	16 years and above	8	13.3

Table 1 provides a demographic overview of the teachers surveyed. The sample is reasonably balanced in terms of school type and years of experience, ensuring a representative snapshot of the teaching population.

Utilization and Frequency of AI Tools

Table 2: French Teachers' Frequency of AI Tool Usage (n=60)

AI Tool	**Percentage of Teachers Using (Often/Very Often)**
Duolingo	21.7%
Grammar Checkers (e.g., Grammarly)	40.0%
Google Translate/Other Translation Apps	68.3%
AI Chatbots (e.g., ChatGPT)	6.7%
AI-Powered Pronunciation Tools	3.3%
AI-Powered Lesson Plan Generators	1.7%

Table 2 shows the frequency of AI tool usage among teachers. The most frequently used tool is Google Translate, while the adoption of more advanced, pedagogically rich tools like AI chatbots and pronunciation tools remains exceptionally low. This suggests a significant gap between the potential of AI and its current application in the classroom.

Perceived Benefits and Challenges

Table 3: Perceived Benefits of AI Tools (Mean Scores, n=60)

Perceived Benefit	**Mean Score**

Improves student vocabulary acquisition	4.10
Enhances student engagement	3.85
Provides instant feedback to students	4.40
Assists with lesson planning	3.40
Reduces teacher workload	3.05
Improves student pronunciation	3.75
Perceived Benefit	Mean Score

Note: 1 = Strongly Disagree, 5 = Strongly Agree

Table 3 indicates that teachers hold a positive view of AI's benefits, with a particularly high score for its ability to provide instant feedback. This aligns with the qualitative data where teachers frequently highlighted the time-saving aspect of AI tools in grading and providing corrections.

Table 4: Perceived Challenges of AI Tools (Mean Scores, n=60)

Perceived Challenge	**Mean Score**
Lack of adequate training	4.65
Limited access to computers and internet	4.85
High cost of AI tools	4.35
Lack of technical support	4.15
Difficulty integrating tools into the curriculum	3.80

Note: 1 = Strongly Disagree, 5 = Strongly Agree

Table 4 highlights the challenges, with "limited access to computers and internet" being the most significant barrier. The qualitative data reinforces this finding, with teachers frequently mentioning the unreliability of internet connections and the scarcity of devices as major obstacles to implementing technology in the classroom.

4.4 Correlation between AI Tool Usage and Student Performance

Table 5: Correlation between AI Tool Usage and Student Performance (n=60)

Variable	**Pearson's r**	**p-value**
Overall AI Tool Usage	0.55	<0.01

Use of Grammar Checkers	0.58	<0.01
Use of Duolingo	0.42	<0.05
Use of AI Chatbots	0.19	>0.05

The moderate positive correlation for 'Overall AI Tool Usage' suggests that even the limited use of basic AI tools is having a measurable positive impact on student outcomes. Overcoming the high barriers identified in Table 4, particularly the Limited access to computers and internet ($M=4.85$)2, is thus critical to scaling these outcomes. To further buttress this, a direct contrast was drawn using the demographic and qualitative data. The sample included a significant portion of public school teachers (58.3%), who operate in environments notoriously constrained by infrastructure limitations. The highly skewed mean of 4.85 on a 5-point scale clearly indicates that this is a near-universal barrier across the state. This finding is reinforced by the qualitative data, where teachers from public schools frequently mentioned the unreliability of internet connections and the scarcity of devices as major obstacles. Conversely, interviews with private school teachers, who typically have better resources, focused more on the lack of training ($M=4.65$) and difficulty integrating tools into the curriculum ($M=3.80$) —challenges related to pedagogy and curriculum design, rather than basic infrastructure. This suggests that infrastructural equity is a key determinant of AI readiness in Lagos State, and any successful policy must first address the foundational technological gaps in the public school system.

Conclusion

This study set out to investigate the utilization and perceptions of AI tools among French language teachers in Lagos State. The findings paint a clear picture: while teachers are overwhelmingly positive about the potential of AI to enhance language instruction, the actual adoption of these tools is largely limited to basic applications like translation and grammar checkers. More advanced, pedagogically rich tools like AI chatbots and pronunciation software are used by only a small fraction of the teaching population.

The data unequivocally points to significant infrastructural and institutional barriers. The most prominent challenge cited by teachers was the lack of reliable internet and sufficient access to computers. A pervasive need for dedicated and ongoing professional training was also a major concern, as many teachers felt ill-equipped to integrate these new technologies into their existing pedagogical practices. These findings reinforce the central argument of this paper: for AI to be a truly transformative tool in French education, it must be supported by a robust ecosystem that includes both technological infrastructure and targeted professional development. The positive correlation between AI usage and student performance, while moderate, suggests that even limited adoption of certain tools is having a measurable impact. Overcoming the identified challenges is therefore crucial for scaling these positive outcomes and significantly improving French education in Lagos State.

Limitations and Future Research

This study is not without limitations. First, the cross-sectional survey design captures perceptions at a single point in time, limiting our ability to establish causal relationships between AI use and student performance improvement. Second, the sample size of 60 teachers, while sufficient for initial descriptive analysis, restricts the generalizability of findings across all regions of Lagos State. Future research should therefore focus on longitudinal studies that track teacher development and student outcomes following a sustained AI integration intervention. Additionally, comparative studies across different states in Nigeria (Anglophone vs. Francophone neighboring state) would provide richer contextual data on the role of geographical location and policy in shaping teacher technological adoption

Recommendations

Based on the findings of this study, the following actionable recommendations are proposed to various stakeholders to facilitate the effective integration of AI in secondary school French education in Lagos State:

Government/Lagos State Ministry of Education

The primary barrier is infrastructure (Mean Score = 4.85). The immediate, short-term action must be a targeted investment plan to provide reliable power supply and dedicated educational internet access to all public schools, as this is the foundational prerequisite for AI integration.

Ministry of Education

To address the lack of training, a Long-Term Policy requires the development and implementation of a mandatory, accredited AI Integration Training and TPACK Certification program tailored specifically for French language pedagogy.

School Administrators

Administrators must facilitate the practical use of AI by allocating budget for the bulk purchase of approved language learning apps and scheduling protected 'Tech Time' for teachers to practice and integrate AI-driven tasks into lesson plans.

French Teachers

Teachers should be encouraged to form Professional Learning Communities (PLCs) for peer-to-peer knowledge sharing, focusing on the pedagogical evaluation of new AI tools for French specific tasks like accent training and real-time comprehension exercises.

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