

Technology Integration in English Language Instruction in Nigerian Secondary Schools: A Focus on Student Engagement and Proficiency

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ABSTRACT

The integration of modern technology in English language education has become increasingly prevalent globally, yet its adoption and effectiveness in developing contexts like Nigeria remain underexplored. This study investigates the impact of modern technology on student engagement and English language proficiency in Nigerian secondary schools, focusing on Dutsinma, Funtua, and Katsina Local Government Areas in Katsina State. Employing a mixed methods research design, the study gathered quantitative data through surveys and qualitative insights through interviews with 200 students, 50 teachers, and 20 administrators across multiple schools. Grounded in Technology Enhanced Language Learning (TELL) and Technology Acceptance Model (TAM) frameworks, the research examined the effects of technology on student engagement and language proficiency, as well as challenges faced in implementation. Findings reveal that while modern technology positively impacts student engagement and facilitates comprehension of English language, its effectiveness is constrained by infrastructure limitations, inadequate teacher training, inconsistent electricity supply, and limited access to digital resources. Despite these barriers, teachers and students express strong desire for greater technological integration, recognizing its value in making language learning more accessible and interactive. The study provides valuable recommendations for policymakers, school administrators, and educators aiming to optimize digital resources in language instruction.

Keywords: Modern Technology, English Language Teaching, Student Engagement, Language Proficiency, Technology Enhanced Language Learning, Secondary Education, Nigeria

INTRODUCTION

In recent years, advancements in technology have significantly influenced the field of education, providing new tools and resources that enhance teaching and learning across various subjects. In language education, technology has introduced innovative ways to engage students, allowing for interactive and immersive learning experiences that can improve language proficiency. Globally, schools are integrating digital resources, such as language learning apps, online dictionaries, interactive grammar exercises, and multimedia content, which allow students to develop their language skills beyond the traditional classroom setting. In Nigeria, English serves as both an official language and the primary medium of instruction in schools, making its effective teaching and learning crucial for students' academic and future career success. Nigeria's language policy designates English as the language of instruction from primary three onward (Federal Republic of Nigeria, 2013), necessitating strong English language proficiency for educational advancement and professional opportunities. However, traditional teaching methods often rely on rote memorization and lack the engagement necessary to build practical language skills, which can result in low student motivation and proficiency.

The integration of modern technology in English language instruction could address these issues by creating an interactive and student-centred learning environment. Digital tools offer opportunities for authentic language use, personalized learning experiences, and immediate feedback, which are critical for language acquisition. Recent research has demonstrated that technology can significantly enhance vocabulary acquisition, grammar comprehension, and listening skills, though its impact on speaking proficiency may be limited due to the lack of

real-time interaction. Despite these potential benefits, many Nigerian secondary schools, particularly in less urbanized regions, face challenges in adopting technology for language learning due to infrastructure limitations, inadequate training for teachers, and a lack of resources. This study focuses on two key objectives drawn from a larger investigation: (1) To assess the impact of modern technological tools on students' English language proficiency, and (2) To assess the impact of these technological tools on students' engagement in English language learning. By examining these two critical dimensions, this research provides empirical evidence on the effectiveness of technology integration in resource-constrained Nigerian secondary schools.

LITERATURE REVIEW

This study is grounded in Technology Enhanced Language Learning (TELL) theory, which posits that digital tools can enhance language acquisition by providing interactive, engaging, and contextually relevant experiences (Garrett, 2009; Chapelle, 2003). TELL encompasses various technological applications, including Computer Assisted Language Learning (CALL), Mobile Assisted Language Learning (MALL), and web-based language learning, all of which emphasize student-centred learning, authentic language use, and the integration of technology to foster communicative competence. Additionally, the Technology Acceptance Model (TAM) provides insights into factors influencing technology adoption (Davis, 1989). TAM posits that perceived usefulness and perceived ease of use influence users' attitudes and behavioural intentions. In the context of this study, TAM helps explain how teachers and students perceive and accept technology for English language learning. When integrated with TELL, this provides a robust theoretical framework for understanding both the pedagogical potential of technology and the factors influencing its adoption in educational settings.

Empirical Studies on Technology in Language Education

Studies on technology's impact in language learning generally show positive outcomes in enhancing students' engagement and performance. Research has demonstrated that digital tools facilitate active learning by providing interactive exercises and multimedia content that foster both individual and collaborative learning experiences. A comprehensive review of technologies for foreign language learning concluded that the most effective technologies include intelligent tutors, speech recognition, and interactive multimedia, particularly for improving grammar, vocabulary, and pronunciation. In the Nigerian context, recent research has shown that using mobile devices and language learning apps increases students' motivation and makes English lessons more accessible and engaging. Studies have revealed significant improvements in vocabulary acquisition and reading comprehension among students who use language learning apps regularly. However, challenges such as infrastructural deficits, teacher digital literacy gaps, and limited access to resources hinder equitable implementation.

A notable pilot project in Nigeria involving AI-assisted English classes demonstrated that students who participated in AI-assisted learning performed better on final tests, achieving a statistically-significant improvement equivalent to nearly two years of typical learning in just six weeks. Both students and teachers were highly engaged, with teachers reporting a greater ability to immerse students in the English language using technology. Research has also highlighted the effectiveness of low-tech digital tools in resource-constrained classrooms. A study in Kaduna State found that students exposed to low-tech digital tools achieved measurable improvements in content development, coherence, vocabulary, and grammatical accuracy, with increased learner engagement, confidence, and active participation. However, challenges persist, with studies noting that while digital technologies are present in schools, their application in vocabulary instruction remains limited, and most English language laboratories are non-functional.

METHODOLOGY

This study employs a mixed methods research design to assess the impact of modern technology on English language teaching in Katsina State secondary schools. The mixed methods approach combines quantitative and qualitative methodologies to provide a comprehensive understanding of the phenomenon under investigation (Creswell & Plano Clark, 2018). The sequential explanatory design is employed, where quantitative data collection and analysis precede qualitative data collection, allowing the quantitative findings to inform the qualitative inquiry (Creswell, 2014). The population of the study comprises all secondary school teachers,

students, and administrators in Dutsinma, Funtua, and Katsina Local Government Areas of Katsina State. A multistage sampling technique was employed. First, five (5) Local Government Areas within Katsina State were selected, and from each LGA, four (4) schools were chosen, including both public and private institutions. The total sample size comprises:

200 students ($5 \text{ LGAs} \times 4 \text{ schools} \times 10 \text{ students}$)

50 teachers ($5 \text{ LGAs} \times 4 \text{ schools} \times 2.5 \text{ teachers per school}$)

20 administrators ($5 \text{ LGAs} \times 4 \text{ schools} \times 1 \text{ administrator}$)

Teachers and administrators were selected using purposive sampling, focusing on those directly involved in English language instruction or school management. Students were selected using random sampling from SS II classes to ensure diversity in academic performance and backgrounds.

Instruments

Three instruments were developed for data collection:

1. **Student Questionnaire:** A structured questionnaire designed to assess students' technology usage, engagement, and perceived impact on English language learning, addressing frequency and types of technology use, perceived usefulness, perceived ease of use, perceived impact on language skills, and behavioural intentions.
2. **Teacher Survey:** A comprehensive survey examining teachers' technology use, perceptions, challenges, and professional development needs.
3. **Interview Guide:** Semi-structured interview protocols for in-depth interviews with teachers, students, and administrators, covering experiences with technology in language learning, benefits and challenges, institutional support, and recommendations for policy and practice.

Validity and Reliability

Content validity was established through review by five experts in educational technology and language education. A pilot test was conducted with 30 students and 10 teachers in two schools not included in the main study. Cronbach's alpha coefficient was calculated for the questionnaires: 0.85 for the student questionnaire and 0.82 for the teacher survey, indicating good internal consistency.

Data Collection Procedure

Data collection was conducted over six weeks, following these stages:

Administrative permissions and informed consent

Quantitative data collection through teacher surveys and student questionnaires

Qualitative data collection through semi-structured interviews and focus group discussions

All interviews and focus groups were audio recorded with consent.

Data Analysis

Quantitative data were analysed using the Statistical Package for the Social Sciences (SPSS) version 26, employing descriptive statistics (frequencies, percentages, means, and standard deviations) and inferential statistics (Pearson correlation). Qualitative data from interviews and focus group discussions were transcribed verbatim and analysed using thematic analysis following Braun and Clarke's (2006) six-phase process, with NVivo software used to facilitate systematic coding and theme development.

RESULTS

Quantitative Findings

Impact on Student Engagement

Table 1: Teachers' Perceptions of Technology Impact on Student Engagement

Impact Indicator	Mean Score (1-5)	Percentage Agreeing
Increased student engagement	4.2	82.0%
Increased participation in class	4.0	74.0%
Increased confidence in English	3.8	70.0%
Makes learning more interesting	4.5	88.0%

Teachers reported that technology had a positive impact on student engagement, with the strongest effects on making learning more interesting (88%) and increasing student engagement (82%). Students similarly reported generally positive perceptions of technology, particularly its role in making learning more interesting (88%) and helping understand difficult concepts (84%).

Impact on Language Proficiency

Table 2: Teachers' Perceptions of Technology Impact on Language Proficiency

Impact Indicator	Mean Score (1-5)	Percentage Agreeing
Improved vocabulary acquisition	4.1	78.0%
Enhanced reading comprehension	3.9	74.0%
Improved grammar understanding	3.7	68.0%
Better listening skills	4.0	76.0%
Enhanced pronunciation	3.5	58.0%
Improved writing skills	3.6	62.0%

Teachers reported that technology had a positive impact across all language proficiency indicators, with the strongest effects on vocabulary acquisition (78%) and listening skills (76%). Students similarly reported positive perceptions of technology's impact on their language skills, particularly vocabulary (78%) and pronunciation (72%).

Correlation Analysis

Table 3: Pearson Correlation between Technology Use and Student Outcomes

Variables	Correlation (r)	Significance (p)
Technology Frequency - Performance	0.52	p < 0.01
Technology Frequency - Engagement	0.58	p < 0.01

Teacher Training - Technology Use	0.48	$p < 0.01$
Resource Availability - Technology Use	0.55	$p < 0.01$

Significant positive correlations were found between technology use and student engagement ($r = 0.58, p < 0.01$) and performance ($r = 0.52, p < 0.01$), suggesting that greater technology use is associated with better outcomes. The correlation between resource availability and technology use ($r = 0.55, p < 0.01$) suggests that infrastructure may be a more significant barrier than teacher training ($r = 0.48, p < 0.01$) in the Nigerian context.

Qualitative Findings

Benefits of Technology: Engagement

Thematic analysis of interviews and focus group discussions revealed that technology enhanced engagement and motivation in English language learning. As one teacher noted:

"When I use videos and interactive exercises, students are more attentive and participate more actively. They look forward to these lessons more than traditional ones." (Teacher, Male, Urban School)

Another teacher shared:

"Using technology has transformed my classroom. Students who were previously shy are now more willing to participate when using interactive tools and apps." (Teacher, Female, Rural School)

Students confirmed these perspectives:

"I use my phone to practice English with apps like Duolingo. It helps me learn new words and practice pronunciation when I'm at home." (Student, Female, Urban School)

Benefits of Technology: Language Proficiency

Teachers and students consistently reported that technology enhanced language proficiency through access to authentic materials and immediate feedback:

"Through YouTube and online news sites, students can hear how native speakers actually use English, which is very different from what is in the textbook." (Teacher, Male, Semi-urban School)

"The grammar apps I use give me immediate feedback, so I know right away if I made a mistake and why it's wrong." (Student, Male, Semi-urban School)

Challenges to Technology Integration

Four major thematic challenges were identified:

Theme 1: Infrastructure Limitations

"Even when we have computers, we can't always use them because there's no electricity. Sometimes we go for hours without power during the day." (Administrator, Male, Rural School)

Theme 2: Inadequate Teacher Training

"I would like to use technology more, but I don't know how to effectively integrate it into my lessons. We need more training." (Teacher, Female, Rural School)

Theme 3: Limited Access to Devices and Resources

"Our school has only 20 computers for over 1,000 students, so it's very difficult to incorporate technology regularly into our teaching." (Administrator, Male, Urban School)

Theme 4: Cultural and Attitudinal Barriers

"Some teachers are afraid that technology will replace them, and parents worry that students will spend too much time on their phones and not focus on learning." (Teacher, Male, Urban School)

DISCUSSION

Impact on Student Engagement

The strong positive correlation between technology use and student engagement ($r = 0.58$, $p < 0.01$) supports the TELL framework's assertion that technology can enhance language learning by creating interactive and engaging experiences. The finding that 88% of students and 82% of teachers agree that technology makes learning more interesting is consistent with research demonstrating that digital tools facilitate active learning and foster collaborative learning experiences. This finding aligns with recent studies on mobile-assisted language learning, which found that language learning applications offer personalized, flexible, and gamified learning experiences that significantly enhance student engagement. The qualitative data revealing that shy students become more willing to participate when using interactive tools further supports the potential of technology to create inclusive learning environments.

The lower correlation between teacher training and technology use ($r = 0.48$, $p < 0.01$) compared to resource availability ($r = 0.55$, $p < 0.01$) suggests that while both are important, infrastructure may be a more significant barrier in the Nigerian context. This aligns with research showing that 68% of Nigerian educators face poor internet access, and infrastructure deficits hinder equitable implementation of technology in education.

Impact on Language Proficiency

The positive correlation between technology use and student performance ($r = 0.52$, $p < 0.01$) confirms the potential of technology to enhance language learning outcomes. The finding that vocabulary acquisition was among the most positively impacted areas (78% of teachers agreed) aligns with research showing that mobile language learning applications significantly enhance vocabulary acquisition, grammar comprehension, and listening skills. However, the more moderate effects on pronunciation (58% agreement among teachers) and writing skills (62%) reflect limitations in available technologies and their implementation. This finding is consistent with research indicating that while mobile apps significantly impact vocabulary and grammar, their effect on higher-order writing or expressive fluency is less pronounced. Similarly, studies have found that while Computer-Assisted Pronunciation Instruction (CAPI) can improve oral proficiency, its effectiveness depends on appropriate tools and training. The finding that 80% of students reported technology prepares them for future careers is consistent with research showing that students recognize the importance of digital literacy for future opportunities. This suggests that students view technology not only as a learning tool but also as preparation for technology-driven careers.

Challenges and Implications

The identification of infrastructure limitations, inadequate teacher training, limited access to devices, and cultural barriers as major challenges confirms findings from previous research in similar contexts. The finding that inconsistent electricity and limited internet connectivity are significant barriers is consistent with research showing that 65% of educators report infrastructural limitations as major barriers to technology integration. The inadequate teacher training identified in this study is consistent with findings that many teachers lack adequate familiarity with internet-based educational tools and vocabulary teaching software. The finding that teachers desire more training and view it as a necessary condition for effective technology integration highlights the need for comprehensive professional development programs that go beyond basic technical skills to address pedagogical integration. The identification of cultural barriers, including teacher hesitation and parental

concerns, underscores the need for awareness campaigns and community engagement in technology integration efforts. This aligns with research highlighting the role of social norms and perceptions in technology adoption.

CONCLUSION

This study investigated the impact of modern technology on student engagement and English language proficiency in secondary schools in Dutsinma, Funtua, and Katsina Local Government Areas of Katsina State, Nigeria. The findings reveal that while technology has the potential to significantly enhance student engagement and language proficiency, its impact is constrained by significant challenges. The study found that technology positively impacts both student engagement and language proficiency, with particularly strong effects on vocabulary acquisition, listening skills, and student participation. The positive correlation between technology use and student outcomes confirms the potential of technology to enhance language learning, while also highlighting the need for effective implementation.

Key challenges identified include infrastructure limitations (inconsistent electricity, limited internet connectivity), inadequate teacher training, limited access to devices, and cultural barriers. These challenges must be addressed through targeted interventions, including professional development programs, infrastructure investment, and policy support. In conclusion, while technology integration in English language instruction in Nigerian secondary schools faces significant challenges, the potential benefits for student engagement and language proficiency are substantial. By addressing the identified barriers through targeted interventions, stakeholders can leverage technology to enhance English language learning outcomes and prepare students for success in a technology-driven world.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

1. Teacher Training and Professional Development

Develop comprehensive pre-service and in-service training programs on technology integration in English language teaching.

Train teachers in both technical skills and pedagogical strategies for technology-enhanced language instruction.

Integrate TPACK framework into teacher education programs.

2. Infrastructure Development

Invest in consistent electricity supply for schools through alternative power solutions (solar, inverters).

Improve internet connectivity in schools, particularly in rural areas.

Provide reliable and affordable internet access for educational purposes.

3. Resource Provision and Accessibility.

Provide government-subsidized digital devices for schools and students

Invest in establishing computer laboratories with reliable internet access in all secondary schools.

Develop and distribute open educational resources for English language instruction.

4. Policy and Curriculum Integration

Develop a national policy on technology integration in language education

Incorporate technology as an integral component of the English language curriculum

Allocate dedicated funding for technology integration in education

5. Stakeholder Engagement

Conduct awareness campaigns addressing cultural attitudes toward technology in education

Engage parents and communities in supporting technology integration

Involve students in technology integration planning and implementation

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Conflict of Interest Statement

The author declares no conflicts of interest in conducting this research.

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