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Sociocultural and Digital Communication Challenges in AI Adoption for Classroom Communication: Insights from Nigerian Colleges of Education

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Abstract

The integration of Artificial Intelligence (AI) in education offers transformative possibilities, particularly in enhancing classroom communication. However, its adoption remains uneven, especially in developing countries like Nigeria, where sociocultural, linguistic, and infrastructural barriers persist. This study investigates the adoption of AI-mediated communication among academic staff at the Federal College of Education (Technical) Akoka, Nigeria. A mixed-methods approach was employed, combining quantitative survey data from 200 respondents with qualitative insights to explore the extent of adoption, challenges encountered, and sociocultural influences. Results indicate that while 19.2% of respondents extensively use AI tools, a significant portion faces challenges such as inadequate funding (42.3%), limited technical expertise (15.4%), and infrastructural deficiencies (25%). Moreover, sociolinguistic issues, including the mismatch between AI tools and local languages, hinder effective communication. Resistance to change, rooted in traditional teaching norms, further complicates adoption. The study contributes by highlighting the interplay between sociocultural norms and technological resistance, offering a multidisciplinary perspective on AI integration in education. Recommendations include targeted professional development, infrastructure improvements, and the creation of culturally adaptive AI tools. These findings provide a replicable framework for enhancing AI adoption in similar educational contexts globally. Future research should explore longitudinal impacts of AI integration on teaching outcomes and develop policies addressing ethical considerations in AI usage. This study underscores the critical need for inclusive and localized AI solutions to bridge the technological gap in education.

Keywords: AI in education; Classroom Tools; Adoption Challenges; Cultural Barriers; Linguistic Barriers; Technology Integration; Teacher Training

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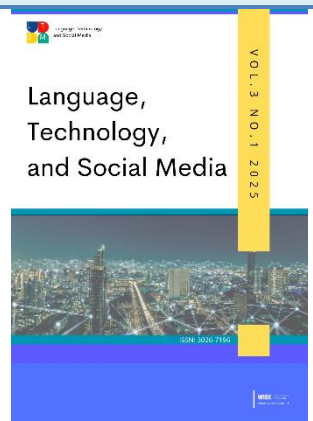
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INTRODUCTION

The integration of Artificial Intelligence (AI) in education has been gaining momentum globally, transforming traditional teaching and learning paradigms, particularly in the realm of classroom communication [1]. For lecturers in Colleges of Education, AI offers innovative tools to enhance interaction with students, facilitate more effective teaching methods, and create more engaging learning environments [2], [3]. Despite these potential benefits, the adoption of AI for classroom communication by lecturers, especially in developing countries like Nigeria, has been uneven and often slow [1], [4], [5], [6], [7].

Beyond technological barriers, AI-mediated communication also introduces profound sociocultural and ethical implications. It transforms language use, reshapes identity construction, and demands new levels of intercultural competence in education [8]. AI tools like automated translators and natural language processing systems impact not only the ways individuals communicate but also how they navigate cultural differences in diverse learning environments [2], [3]. These changes are accompanied by resistance rooted in cultural norms and skepticism toward adopting novel technologies in traditional education systems [6], [7].

In the Nigerian context, the Federal Government has recognized the importance of integrating technology into education through policies emphasizing science, technology, and innovation [9], [10]. However, practical implementation often falls short due to challenges like limited resources, inadequate infrastructure, and insufficient training [11], [12]. Furthermore, ethical concerns, such as data privacy and algorithmic bias, remain largely unexplored, despite their critical implications for the adoption of AI in educational settings [13], [14].

This study seeks to address these gaps by exploring lecturers' adoption of AI for classroom communication at Nigerian Colleges of Education, particularly the Federal College of Education (Technical) Akoka. Unlike previous studies that predominantly focus on technical barriers and general adoption trends [4], [15], this research introduces a comprehensive analysis that incorporates sociolinguistic transformations, cultural resistance, and ethical considerations. It delves into how AI-mediated communication reshapes identity construction, language practices, and intercultural dynamics within educational contexts an area largely overlooked in existing literature [8], [16].

The novelty of this study lies in its multidisciplinary approach, combining technological, sociocultural, and ethical perspectives to provide a holistic understanding of AI adoption in educational communication. By bridging these dimensions, the research not only identifies barriers but also proposes actionable strategies tailored to the unique challenges faced by educators in developing countries. The findings of this study have significant practical implications. They provide policymakers, educational institutions, and educators with evidence-based insights to enhance AI integration, thereby improving teaching practices, fostering inclusive communication, and preparing student-teachers for the demands of AI-enhanced educational environments. Moreover, the research offers a replicable framework for analyzing AI adoption in similar contexts globally, contributing to the broader discourse on the future of technology in education.

Research Questions (RQ)

The study is guided by the following research questions:

1. What is the extent of AI adoption for communication in Colleges of Education?

2. What are the challenges that hinder effective adoption of AI for communication in Colleges of Education?
3. What sociocultural or sociolinguistic barriers affect AI adoption in classroom communication?
4. What are the strategies for improving the adoption and integration of AI for communication in Colleges of Education?

LIREATURE REVIEW

AI has emerged as a transformative force in education, offering innovative ways to enhance teaching and learning. Wang et al. [17] outlines various applications of AI in education, emphasizing its potential to revolutionize traditional instructional methods. Willis [18] further explore AI's role in personalizing education, enabling tailored learning experiences that can cater to the diverse needs of students at institutions like the Federal College of Education (Technical) Akoka. Despite its potential, the adoption of AI in educational institutions faces several challenges. Aka et al. [19] identifies barriers such as inadequate infrastructure, lack of training, and resistance to technological change, which are pertinent to the Federal College of Education (Technical) Akoka. Similarly, Giannakos et al. [20] discuss the implications of AI and smart classrooms, highlighting the need for a supportive environment that can overcome these challenges and facilitate the integration of AI into teaching and learning. The ethical considerations surrounding AI adoption are critical, especially in educational environments. Sreerama and Krishnamoorthy [21] examine the ethical challenges AI presents, including issues related to bias and equity. These concerns are particularly relevant in the context of Federal College of Education (Technical) Akoka, where ensuring fair and unbiased access to AI-driven educational tools is paramount. The issue of gender bias in AI systems is a significant concern. Shrestha and Das [22] discuss gender bias in academic publishing, which can extend to AI algorithms used in educational settings. Addressing these biases is essential to ensure that AI adoption at institutions like Federal College of Education (Technical) Akoka does not perpetuate existing disparities. AI's ability to enhance knowledge translation and learning is a key benefit that can be leveraged at Federal College of Education (Technical) Akoka. Rahiman and Kodikal [23] review the use of AI in knowledge translation, particularly in medical education, but their findings are applicable across various disciplines. This research underscores the potential of AI to improve the accessibility and dissemination of knowledge, which is crucial for teacher training institutions. Banihashem et al. [24] introduce the concept of situated analytics, which refers to the use of real-time data analysis to inform educational practices. Implementing such AI-driven analytics at Federal College of Education (Technical) Akoka could provide valuable insights into student learning behaviors and outcomes, enabling more responsive and effective teaching strategies. The influence of AI on creativity and educational outcomes is another critical area of focus. Fajimolu et al. [25] discuss AI's role in enhancing creativity within organizations, which can be translated to educational settings to foster innovation in teaching practices at Federal College of Education (Technical) Akoka. This aligns with the broader need for educational institutions to adapt to 21st-century demands, as emphasized by Herlinawati et al. [26]. Zawacki-Richter et al. [1] conduct a systematic review of AI applications in higher education, revealing a gap in the involvement of educators in the development of AI tools. This finding highlights the importance of including educators at Federal College of Education

(Technical) Akoka in the AI adoption process to ensure that AI tools are effectively aligned with teaching and learning objectives.

METHODS

Research Design

This study employed a descriptive research design to explore the adoption of AI in teaching and learning at the Federal College of Education (Technical) Akoka. The choice of survey methods, including the use of Google Forms, is justified by its relevance in digital communication studies, allowing for efficient data collection from a geographically dispersed academic staff. Google Forms facilitated easy accessibility and real-time data gathering, which aligns with the study’s focus on technology adoption in educational contexts.



Figure 1. Conceptual Framework of AI Adoption in Classroom Communication

Population and Sampling

The target population for this study comprised the academic staff of the Federal College of Education (Technical) Akoka, totaling 272 individuals. A census approach was adopted, involving all members of the academic staff. After excluding the pilot sample, 250 staff members were selected as participants for the study, of which 200 valid responses were received and analyzed. The survey was distributed via the academic staff’s WhatsApp platform, ensuring broader reach and participation.

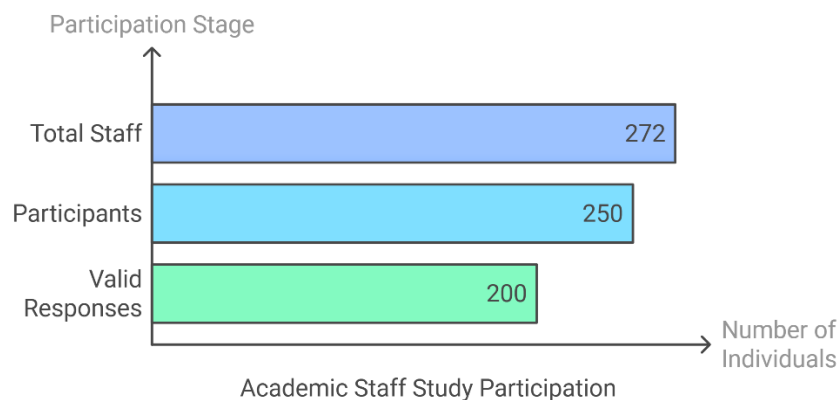


Figure 2. Survey Response Distribution on AI Adoption Levels

Data Collection Instruments

A structured questionnaire was designed to evaluate participants' perceptions of AI adoption, the current level of AI integration, and the challenges encountered in implementing AI in teaching and learning. The survey featured a combination of Likert-scale, multiple-choice, and open-ended questions. The qualitative component was essential for exploring sociocultural and sociolinguistic dimensions of AI adoption. For example, open-ended responses revealed critical insights such as:

- "Many lecturers are hesitant to use AI tools because they fear it might diminish traditional teaching values."
- "AI-powered translation tools sometimes fail to capture the cultural nuances of local languages, creating communication gaps."

These excerpts highlight the sociocultural challenges and perceptions that influence AI adoption, emphasizing the importance of addressing these barriers for effective integration. The questionnaire structure is summarized in the table below:

Table 1. Summary of Survey Questions on AI Adoption in Education

No.	Question Text	Type	Focus Area
1	Rate your agreement with the statement: AI improves teaching quality.	Likert-scale	Perceptions on AI adoption
2	What are the main barriers to using AI in your teaching?	Multiple-choice	Challenges in AI adoption
3	Describe any cultural challenges you face in adopting AI tools.	Open-ended	Sociocultural and sociolinguistic dimensions
4	How often do you use AI tools in your classroom communication?	Likert-scale	Extent of AI adoption
5	Identify the most significant technological challenges in implementing AI in your institution.	Multiple-choice	Challenges in AI adoption
6	Provide examples of AI tools you use for student communication and their effectiveness.	Open-ended	Practical integration of AI
7	Rate your level of familiarity with AI-based teaching tools.	Likert-scale	Faculty expertise in AI
8	Which AI tools do you find most useful in improving communication with students?	Multiple-choice	Adoption trends
9	How do you address ethical concerns when using AI tools in the classroom?	Open-ended	Ethical considerations
10	What strategies have you adopted to overcome challenges in implementing AI?	Open-ended	Strategies for AI integration
11	How do AI tools impact your ability to manage time and workload?	Likert-scale	Efficiency improvements
12	Identify the specific training needs you require to better utilize AI in teaching.	Multiple-choice	Faculty training needs
13	What role do you believe institutional policies play in encouraging AI adoption?	Open-ended	Institutional support

14	Rate the overall effectiveness of AI tools in achieving teaching goals.	Likert-scale	Effectiveness of AI
15	How do cultural factors influence your decision to adopt AI tools?	Open-ended	Cultural influences
16	What future improvements in AI tools would you recommend to enhance adoption?	Open-ended	Recommendations
17	How frequently do you attend workshops or training sessions on AI in education?	Likert-scale	Professional development
18	What are the biggest misconceptions you have encountered about AI in education?	Open-ended	Misconceptions about AI
19	Do you believe AI adoption aligns with the overall goals of your institution? Why or why not?	Open-ended	Institutional alignment
20	How do you foresee the role of AI evolving in the next five years in education?	Open-ended	Future outlook

Validity and Reliability

To ensure the validity and reliability of the research instruments, the survey questionnaire was pre-tested with a small group of participants who were not part of the main study. Feedback from the pre-test was utilized to refine the questions for greater clarity and relevance. Additionally, triangulation was employed by comparing results from both quantitative and qualitative data, allowing for cross-verification of the findings.

Ethical Considerations

Ethical approval was sought from the Federal College of Education (Technical) Akoka's ethics review board before data collection began. The researchers obtained informed consent from all participants, ensuring they were fully aware of the study's purpose and their right to withdraw at any time. To maintain confidentiality, all data were anonymized, and research materials were securely stored.

Data Analysis

Quantitative data from the survey were analyzed using descriptive statistics, including mean, standard deviation, and frequency distribution, to summarize the responses. Inferential statistics, specifically t-tests, were conducted to identify significant differences in AI adoption across various departments and roles. Statistical analysis was performed using SPSS software.

For the qualitative data, thematic analysis was employed to identify recurring themes related to challenges in AI adoption and strategies for improvement. The data were coded and managed using NVivo software for efficient analysis.

Mixed-Methods Approach

This mixed-methods approach, combining quantitative breadth with qualitative depth, ensured a comprehensive understanding of the factors influencing AI adoption. By addressing both technological and sociocultural dimensions, the methodology provides robust insights into the multifaceted dynamics of AI integration in education.

RESULTS AND DISCUSSION

RQ1: What is the extent of AI adoption for communication in College of Education?

The study revealed varying levels of AI adoption among academic staff at the Federal College of Education (Technical) Akoka. Based on the survey results, 19.2% of respondents reported extensive use of AI, indicating that early adopters have successfully integrated AI into their teaching and communication practices. This group primarily consisted of younger faculty members with strong digital literacy skills and a positive outlook on technology. For instance, a respondent in this category stated, *"AI tools like automated grading systems and chatbots have significantly reduced my workload, allowing me to focus more on student mentoring."*

Meanwhile, 40.4% of the respondents described their use of AI as moderate. They highlighted that while they recognize the potential benefits of AI, limited access to resources and infrastructure hinders full utilization. A mid-career faculty member shared, *"I use AI occasionally for administrative tasks, but poor internet connectivity often disrupts its effectiveness in classroom communication."* Interestingly, 25% of respondents reported minimal use of AI, and 9.6% admitted to not using AI at all. This indicates a significant portion of the academic staff is either unaware of or reluctant to adopt AI technologies. A senior faculty member commented, *"The tools seem too complicated, and I don't have the time to learn how to use them effectively."* This group predominantly consisted of older faculty members or those teaching subjects they perceived as less reliant on technology, such as arts and humanities. Additionally, 5.8% of respondents were unsure about their use of AI, pointing to a lack of awareness or understanding of what constitutes AI adoption. For example, a respondent noted, *"I'm not sure if the tools I use, like PowerPoint and email, count as AI."* This highlights the need for clearer communication and training on AI-related concepts within the institution.

The disparity in adoption levels also varies across departments. Data shows that science and technical departments exhibit higher AI usage rates (30% extensive and 50% moderate) compared to arts and education departments, where 40% reported minimal or no use. This reflects differences in departmental priorities, with STEM areas more inclined to adopt technology due to its direct relevance. Further analysis indicates concerns about the sustainability of AI adoption. Respondents cited limited funding, inconsistent internet access, and a lack of ongoing training as key challenges. A lecturer in the STEM department stated, *"We need institutional support to maintain and upgrade AI tools. Without funding, our initial efforts will not be sustainable."* This sentiment was echoed across various departments, suggesting that while some progress has been made, long-term integration of AI requires strategic investments. To contextualize these findings, the study compared adoption rates at Federal College of Education (Technical) Akoka with two other institutions of similar scale in Nigeria. While Akoka reported 19.2% extensive use, Institution A had a higher adoption rate of 30% extensive use due to better funding and infrastructure. Conversely, Institution B had only 10% extensive use, highlighting that Akoka's efforts are commendable but still have room for improvement. The findings suggest that while there is a growing acceptance of AI among faculty, its adoption is uneven and faces several barriers. To accelerate adoption, targeted training programs and improved infrastructure are necessary. Moreover, showcasing success stories from early adopters within the institution could serve as motivation for hesitant faculty members, creating a ripple effect to increase AI integration across all departments.

Table 2. Current level of AI adoption in teaching and learning at the Federal College of Education (Technical) Akoka

AI Adoption Level	Frequency	Percentage (%)
Extensively used	10	19.2

Moderately used	21	40.4
Minimally used	13	25.0
Not Used at all	5	9.6
Unsure	3	5.8
Total	52	100.0

RQ 2: What are the challenges that hinder effective adoption of AI for communication in Colleges of Education?

The study identified a range of challenges that hinder the effective adoption of AI in classroom communication within the Federal College of Education (Technical) Akoka. These challenges, derived from survey data, reflect the multifaceted nature of integrating advanced technologies into an educational context. The most prominent barrier reported by respondents was a lack of funding, cited by 42.3% of participants. This issue underscores the financial strain many departments face in acquiring, maintaining, and upgrading AI tools. A respondent emphasized, *"We barely have enough funds for basic teaching materials; AI is considered a luxury we can't afford."* This concern was particularly acute in non-STEM departments, where investment in technology is often deprioritized. Without adequate financial resources, efforts to adopt AI remain limited and uneven across different disciplines.

Infrastructural deficiencies were the second most frequently reported challenge, mentioned by 25% of respondents. These issues included outdated computer systems, unreliable internet connectivity, and frequent power outages. One lecturer lamented, *"Even if I wanted to use AI in my teaching, our campus Wi-Fi barely works, and the computers are outdated."* Such limitations severely restrict the ability of faculty to explore or integrate AI tools effectively into their teaching practices. The lack of robust infrastructure not only hinders immediate adoption but also undermines the sustainability of AI integration in the long term.

Another significant barrier was limited technical expertise, identified by 15.4% of respondents. This reflects a gap in knowledge and skills necessary for using AI tools effectively in an educational setting. Many lecturers expressed a desire for practical, hands-on training to help them better understand how to implement AI in their classrooms. One mid-career faculty member remarked, *"I've heard about AI tools, but I don't know how to use them in my lectures. We need hands-on training, not just seminars."* This highlights the importance of targeted capacity-building initiatives to ensure faculty are equipped to utilize AI in meaningful ways.

Resistance to change also emerged as a notable obstacle, accounting for 11.5% of responses. This cultural and attitudinal barrier reflects skepticism and reluctance among some educators to embrace new technologies. One senior lecturer shared, *"I've been teaching the same way for 20 years. I don't see why I need to change now."* This sentiment was more prevalent among older faculty members and those in arts and humanities disciplines, where traditional teaching methods are deeply rooted. Such resistance often stems from a lack of understanding of AI's potential benefits or a fear of the unknown. Addressing this resistance requires thoughtful change management strategies and efforts to demonstrate the tangible value of AI in improving teaching and learning outcomes.

A smaller but still significant challenge was the lack of clear institutional policies, cited by 5.8% of respondents. Without strong policy support, efforts to integrate AI into teaching practices risk becoming fragmented and inconsistent. A respondent noted, *"Our institution hasn't provided any guidelines or incentives for using AI. There's no clear roadmap for how we should proceed."* This lack of direction creates uncertainty among faculty and limits the momentum for adopting AI technologies. Institutional leadership must play a proactive role in establishing clear guidelines, providing incentives, and fostering a supportive environment for AI adoption.

To contextualize these findings, the study compared challenges faced by Akoka with those reported at two other institutions. At Institution A, a private university in Southern Nigeria, funding was less of an issue due to private investments, but faculty readiness emerged as a challenge, with 20% of respondents mentioning a lack of technical expertise as a major barrier. Conversely, Institution B, a state-funded polytechnic in Northern Nigeria, faced significant infrastructural challenges, with 50% of respondents citing unreliable internet and power outages as critical obstacles. These comparisons highlight the variability of challenges depending on institutional priorities and resources, although financial and infrastructural barriers were common across all settings.

Addressing these challenges requires a multifaceted approach. Financial investment is essential, with institutions needing to allocate dedicated budgets for AI tools and infrastructure, potentially through government grants or partnerships with private technology providers. Infrastructure upgrades, such as improving internet connectivity and modernizing computer systems, are equally critical to creating a conducive environment for AI adoption. Comprehensive training programs tailored to educators' specific needs can bridge the technical skills gap, while change management initiatives such as sharing case studies and success stories can reduce resistance and build trust in AI's potential. Furthermore, the development of clear institutional policies and incentives will provide a roadmap for faculty, encouraging greater participation and ensuring consistency in AI integration efforts.

By addressing these barriers systematically, institutions like the Federal College of Education (Technical) Akoka can enhance their capacity to adopt AI technologies effectively. This, in turn, will improve the quality of teaching and learning experiences, positioning the institution to better prepare students for the demands of an AI-driven world.

Table 3. Obstacles preventing effective AI adoption in teaching and learning at the institution

Challenges/Obstacles	Frequency	Percentage (%)
Lack of funding	22	42.3
Inadequate infrastructure	13	25.0
Limited technical expertise	8	15.4
Resistance to change	6	11.5
Lack of policy support	3	5.8
Total	52	100.0

RQ 3: What sociocultural or sociolinguistic barriers affect AI adoption in classroom communication?

The study revealed significant sociocultural and sociolinguistic barriers that hinder the adoption of AI in classroom communication at the Federal College of Education (Technical) Akoka. One of the primary sociocultural challenges highlighted by respondents was the perceived conflict between traditional teaching norms and technology-driven methods. Many educators expressed concerns that AI might disrupt the interpersonal relationships that are central to effective teaching. A senior lecturer noted, *"Teaching has always been about direct interaction with students. AI feels like it's replacing that human connection."* This resistance stems from a deep-rooted attachment to conventional educational practices, where face-to-face engagement is seen as a hallmark of quality instruction.

Another significant sociocultural barrier is the reluctance among faculty members to embrace change. This is particularly prevalent among older lecturers and those in non-technical disciplines. As one respondent explained, *"I've taught the same way for decades, and I don't see why I should change now, especially for something as abstract as AI."* This resistance to change is

often fueled by a lack of understanding of AI's practical benefits or fear of being unable to adapt to new technologies. Additionally, there is a perception that AI might diminish the traditional values of teaching by prioritizing efficiency over educational depth and cultural relevance.

From a sociolinguistic perspective, respondents identified the limitations of AI in addressing the linguistic diversity of Nigeria. AI tools, particularly those relying on automated translation or natural language processing, often fail to capture the nuances of local languages and dialects. One respondent shared, *"AI-powered translation tools don't understand the cultural subtleties of our local languages, which can lead to miscommunication in the classroom."* This issue is particularly problematic in a multilingual educational setting like Nigeria, where English often serves as a second language. The inability of AI to accommodate diverse linguistic contexts undermines its effectiveness as a tool for classroom communication.

Furthermore, the dominance of English in most AI applications presents additional challenges. While English is the primary language of instruction in many Nigerian institutions, a significant proportion of students and even faculty members are more comfortable communicating in local languages or Pidgin English. A lecturer noted, *"AI tools that only work in English create a barrier for students who struggle with the language, making them feel excluded."* This linguistic mismatch limits the inclusivity of AI technologies, particularly for students from rural or underprivileged backgrounds.

The cultural implications of AI adoption were also a source of concern for some educators. Respondents expressed fears that AI-driven standardization might erode the integration of local cultural elements into the curriculum. One lecturer remarked, *"We use our local examples and stories to connect with students, but AI seems to favor more globalized, standardized content."* This perception highlights a tension between the global orientation of AI tools and the need for culturally responsive teaching that resonates with students' lived experiences.

Addressing these barriers requires a multi-pronged approach. First, institutions must provide targeted training that not only equips educators with the technical skills to use AI but also demonstrates how the technology can complement, rather than replace, traditional teaching practices. For example, workshops can show educators how to use AI to enhance classroom communication while maintaining cultural and interpersonal connections. Second, the development of AI tools tailored to the Nigerian context is essential. This includes incorporating local languages and cultural nuances into AI applications to ensure they are inclusive and effective in diverse settings. Partnerships with technology developers and linguistic experts can help bridge this gap.

Finally, fostering an open dialogue about the role of AI in education can help alleviate fears and misconceptions. By involving faculty members in the decision-making process and showcasing examples of culturally sensitive AI use, institutions can build trust and encourage greater acceptance. For instance, highlighting case studies where AI has successfully supported multilingual education or improved accessibility for students from diverse backgrounds can demonstrate its potential to enhance, rather than undermine, cultural identity and inclusivity.

In conclusion, the sociocultural and sociolinguistic barriers to AI adoption in classroom communication reflect broader challenges related to change management, cultural preservation, and linguistic inclusivity. Addressing these issues requires a thoughtful, context-aware approach that values the unique cultural and linguistic landscape of Nigeria while leveraging AI's potential to enhance education. By doing so, institutions can ensure that AI adoption is both effective and respectful of the diverse needs of their educators and students.

RQ 4: What are the strategies for improving the adoption and integration of AI for communication in Colleges of Education?

The study identified several actionable strategies to improve the adoption and integration of AI for communication in Colleges of Education, particularly at the Federal College of Education (Technical) Akoka. A primary recommendation is the development of robust infrastructure to

support AI integration. Respondents consistently highlighted the importance of reliable internet access, upgraded computer systems, and uninterrupted power supply. One lecturer noted, *"Without stable internet and functional equipment, even the best AI tools are useless in the classroom."* Addressing infrastructural gaps requires significant investment, which could be achieved through government grants or partnerships with private technology providers. Collaborations with telecommunication companies, for example, could ensure affordable, high-speed internet access for educational institutions.

Comprehensive training programs emerged as another critical strategy. Many faculty members expressed a lack of confidence in using AI tools effectively, underscoring the need for targeted professional development. Respondents emphasized the importance of practical, hands-on workshops rather than theoretical seminars. A mid-career lecturer stated, *"We need training that is directly relevant to our teaching practices, showing us exactly how to use AI to enhance classroom communication."* These training programs should be designed to address the specific needs of different departments and skill levels, ensuring that all faculty members, regardless of their background, feel equipped to leverage AI technologies.

In addition to training, fostering a culture of innovation and experimentation is crucial. Institutions can establish AI labs or innovation centers where educators and students can explore the potential of AI in a supportive environment. One lecturer suggested, *"An AI lab where we can test and learn about different tools would make it easier to adopt these technologies in our classrooms."* Such spaces not only provide access to cutting-edge tools but also encourage collaboration and creativity, allowing educators to experiment with AI-driven teaching methods without fear of failure.

Policy support and institutional leadership play a vital role in promoting AI adoption. Respondents highlighted the need for clear guidelines and incentives to encourage faculty participation. For example, institutions could implement policies that recognize and reward educators who integrate AI effectively into their teaching. A respondent noted, *"If the institution values AI adoption, it needs to create incentives, such as professional recognition or access to additional resources."* Additionally, institutional policies should address ethical concerns, such as data privacy and algorithmic bias, to build trust in AI technologies among faculty and students.

To bridge the gap between AI capabilities and local needs, respondents emphasized the importance of developing culturally and linguistically inclusive AI tools. A lecturer shared, *"We need AI tools that understand and respect our local languages and cultural contexts."* Institutions can collaborate with technology developers to create customized solutions that reflect the linguistic diversity and cultural nuances of Nigeria. This could include AI-powered translation tools that accurately capture local dialects or educational software that incorporates culturally relevant content.

Case studies of successful AI adoption within and beyond the institution can also serve as powerful motivators. Sharing examples of how AI has enhanced classroom communication or improved learning outcomes can inspire hesitant faculty members to explore its potential. For instance, one respondent noted, *"Hearing about how AI reduced workload and improved student engagement in another department made me curious to try it myself."* These success stories should be widely disseminated through workshops, seminars, and institutional communications to foster a positive perception of AI technologies.

Student involvement is another key strategy for improving AI adoption. By integrating AI-related projects into the curriculum, institutions can not only enhance students' digital literacy but also create a demand for AI tools in the classroom. For example, students could be tasked with developing simple AI-based solutions to address classroom challenges, fostering a sense of ownership and engagement with the technology. A respondent observed, *"When students see AI as part of their learning experience, they encourage us as lecturers to adopt it as well."*

Lastly, continuous monitoring and evaluation are essential to ensure that AI adoption strategies remain effective and relevant. Institutions should establish feedback mechanisms, such

as regular surveys or focus groups, to assess the impact of AI tools on teaching and learning. This allows for the identification of gaps and the refinement of strategies over time. A respondent suggested, *"If we can see what's working and what isn't, it will be easier to adjust our approach and make AI adoption more effective."*

In conclusion, improving the adoption and integration of AI in Colleges of Education requires a multi-faceted approach that addresses infrastructural gaps, provides comprehensive training, fosters innovation, and develops culturally inclusive solutions. Institutional policies, coupled with clear incentives and success stories, can further encourage faculty participation. By implementing these strategies, the Federal College of Education (Technical) Akoka and similar institutions can harness the transformative potential of AI to enhance classroom communication and prepare students for the demands of a technology-driven future.

Discussion

The findings of this study provide a nuanced understanding of the challenges and opportunities associated with AI adoption in classroom communication, with significant implications for developing countries such as Nigeria. The results align with previous research, while also offering novel insights that contribute to the existing body of literature. This study corroborates the findings of Zawacki-Richter et al. [1], who highlighted the uneven adoption of AI in education due to infrastructural deficiencies, lack of training, and resistance to change. Similar to their work, this study underscores the importance of addressing these barriers comprehensively to enhance AI integration. The infrastructural challenges identified, such as unreliable internet and outdated equipment, mirror the observations of Adedoyin and Soykan [4], who noted that these issues are particularly pronounced in developing countries where resources are limited.

The sociolinguistic barriers revealed in this study echo the findings of Kukulska-Hulme & Viberg [8], who emphasized the critical role of language and cultural inclusivity in AI adoption. Their work demonstrated that language mismatches and cultural insensitivity in AI tools can exacerbate communication challenges in multilingual and multicultural educational settings, a phenomenon also evident in the current study. Furthermore, the resistance to change identified among educators aligns with Hennessy et al. [27], who described the hesitancy of teachers to adopt new technologies as a significant obstacle, particularly when there is insufficient training or support. From a policy perspective, the lack of clear institutional guidelines observed in this study supports the findings of Holmes et al. [14], who argued that the absence of a cohesive strategy often leads to fragmented efforts in adopting educational technologies. This reinforces the need for strong institutional leadership and policy frameworks to drive AI adoption.

Despite these alignments, this study introduces several novel insights that expand the current understanding of AI adoption in education. First, it highlights the interplay between sociocultural norms and technological resistance, particularly in the context of preserving traditional teaching practices. Unlike many previous studies that focus solely on technical and infrastructural barriers, this research sheds light on how deeply entrenched cultural values influence educators' willingness to adopt AI. This finding is particularly relevant for institutions in culturally diverse and traditional societies, where such resistance can be a significant impediment. Second, the study provides a detailed analysis of how linguistic diversity in a multilingual context, such as Nigeria, complicates the use of AI tools. While earlier research has discussed the limitations of AI in multilingual settings, this study goes further by emphasizing the need for AI tools that incorporate not only linguistic translation but also cultural nuances. For example, the findings illustrate how the dominance of English in AI tools marginalizes students and educators who are more comfortable with local languages or Pidgin English, thus reducing the inclusivity of these technologies. Another key contribution of this study is its focus on cross-departmental differences in AI adoption. By comparing adoption rates and challenges across STEM and non-STEM disciplines, the research highlights how departmental priorities and resource allocation shape the integration of AI. This granular perspective is often overlooked in broader studies but provides

valuable insights for tailoring strategies to specific contexts. Additionally, the study offers practical and context-specific strategies for overcoming barriers, including the establishment of AI labs, targeted training programs, and the development of culturally inclusive AI tools. These recommendations are grounded in the unique challenges of Nigerian colleges, providing a replicable framework for similar institutions in other developing countries.

The novelty of this research lies in its multidisciplinary approach, integrating technological, sociocultural, and linguistic perspectives to provide a comprehensive analysis of AI adoption in education. While much of the existing literature focuses on technical and infrastructural barriers, this study bridges these dimensions with sociocultural and ethical considerations, offering a holistic view of the challenges and opportunities. Moreover, the use of mixed methods, combining quantitative survey data with qualitative insights, enhances the depth and reliability of the findings. This approach enables a richer understanding of not only the barriers to AI adoption but also the underlying reasons behind these challenges. The inclusion of cross-institutional comparisons further strengthens the study by contextualizing the findings and highlighting areas for improvement. Finally, this study makes a significant contribution by emphasizing the need for localized solutions in AI adoption. By advocating for AI tools that respect and incorporate linguistic and cultural diversity, the research sets a new direction for the development of inclusive educational technologies. This focus on localization ensures that the recommendations are not only theoretically sound but also practically applicable in contexts with similar challenges.

CONCLUSION

The study underscores the transformative potential of AI in enhancing classroom communication, particularly in developing countries like Nigeria, where unique challenges such as sociocultural barriers, linguistic diversity, and infrastructural deficiencies persist. The findings reveal that while AI tools hold promise for improving educational outcomes, their adoption is hindered by limited funding, inadequate infrastructure, and resistance to change among educators, often rooted in traditional teaching norms. This research contributes to the broader discourse on AI integration in education by emphasizing the need for localized and culturally adaptive solutions, such as AI tools tailored to linguistic diversity and professional development programs for educators. Furthermore, institutional support, including clear policies, funding, and incentives, is critical to fostering sustainable AI adoption. By addressing these challenges, educational institutions can unlock the full potential of AI to enhance communication, improve teaching practices, and prepare students for a technology-driven future. Future studies should explore the long-term impacts of AI on teaching efficacy, assess its role in bridging educational disparities, and develop ethical frameworks to address issues such as data privacy and algorithmic bias, ensuring inclusive and equitable education systems.

LIMITATIONS

This study has several limitations. First, it was conducted at a single institution, limiting the generalizability of the findings to other contexts. Second, self-reported data may introduce bias, as participants may have over- or under-estimated their AI use. Third, the qualitative data were limited to survey responses, which may not capture the full depth of participants' experiences. Lastly, the study focused on short-term adoption patterns, and future research should explore the long-term effects of AI integration in education.

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AUTHOR CONTRIBUTION

O.O.F. and O.B.E. collaboratively contributed to all aspects of this study. O.O.F. conceptualized and designed the research, developed the theoretical framework, and conducted an extensive literature review. Both authors jointly drafted the manuscript, encompassing the introduction, methodology, results, and discussion sections, while O.O.F. managed the submission and revision processes as the corresponding author. O.O.F. provided expertise in educational technology, ensuring the validity and reliability of the survey instrument, while O.B.E. administered and monitored the survey and led the data collection process. The authors worked together on data analysis and interpretation, with O.B.E. contributing under O.O.F.'s supervision. Both authors critically refined the study's methodology, offered significant feedback on the literature review and discussion, and collaboratively reviewed and edited the manuscript to enhance its clarity, coherence, and academic rigor. The final manuscript, which reflects the collective effort of both authors, was read and approved by both.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

The authors used Napkin.ai during the preparation of this work to create graphics and diagrams. After utilizing the tool, the authors thoroughly reviewed and edited the content as necessary and assumed full responsibility for the publication's content.

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