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APPLICATION OF ARTIFICIAL INTELLIGENCE IN TEACHING OF ARABIC LANGUAGE: A QUALITATIVE EXPLORATION OF OPPORTUNITIES AND CHALLENGES

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Abstract
This study investigates the application of artificial intelligence (AI) in teaching and learning Arabic language, exploring its benefits and challenges faced in the adoption process. We adopted qualitative study and purposive sampling was to select six Arabic/Islamic schools distributed across Ilorin Metropolis. The researchers selected three Arabic teachers per school, making a total of 18 teachers. We used the same selection process to select students who voluntarily participated in the study, have a total of 18 students. Semi-structured interview was used for data collection. The interview questions were validated by two independent experts in the field of Arabic Language through contents validity to ensure accuracy and consistency. Our study adhered to all ethical considerations guiding the ethics of research. Thematic analysis was used to analyze qualitative data via NVivo 14. We found that technical and poor accessibility barriers were widely reported, with teachers noting unstable internet, limited device availability, and lack of institutional infrastructure. This study concludes that artificial intelligence plays an increasingly significant role in the teaching and learning of Arabic, offering meaningful opportunities while presenting notable challenges. AI tools enhance engagement, personalize learning, and support language acquisition through instant feedback, pronunciation assistance, and adaptive vocabulary development. Our study calls strengthening teacher training, developing Arabic-specific AI policy, and improving infrastructure for effective AI integration.
Keywords: Artificial intelligence, Teaching-learning, Arabic language, Opportunities and Challenges

Introduction

The advancement in technology has changed the nomenclature of teaching and learning across the various disciplines, particularly Arabic Language. The application of Artificial Intelligence (AI) has transformed traditional teaching methods by offering more interactive, personalized, and efficient learning experiences. Hanandeh et al. (2024) affirmed that adoption of artificial intelligence in the current era has created unique opportunities and challenges for the broad linguistic field of Arabic language and the possibility of employing these applications in learning, generating, and proofreading Arabic language. This innovation has aided teaching and learning in Arabic. Thus, increased access to knowledge enabled greater exchange of ideas. Samin & Osman (2024) observed that the integration of Artificial Intelligence (AI) in language education, particularly Arabic Language, has shown significant promise in enhancing teaching effectiveness and student engagement.
According to Al-Gharaibeh (2023) suggests that artificial intelligence has the potential to pose a number of challenges to the Arabic language, such as preserving Arabic linguistic and cultural identity and fearing that western culture will infiltrate Arabic because of these applications and programmes. Hashem, et al. (2024) emphasized that the integration of AI tools such as ChatGPT in education can lighten teachers' workload by automating administrative tasks, allowing teachers to focus more on direct interactions with students and creative learning activities.

Researchers have made a significant contribution by conceptualized application of Artificial Intelligence (AI) in Arabic Language. Samin & Osman (2024) studies shown that Deep AI integration teaching the Arabic language at Universitas Islam Riau shows potency for increasing quality learning through personalization, improving

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student involvement, and improving efficiency in assessment and feedback. The authors affirmed that integration of AI has significant contributions to the quality of Arabic education. In the same vein, Fuertes-Gutiérrez (14) research shows that AI can offer innovative solutions to traditional pedagogical challenges, increasing the personalization, accessibility and effectiveness of language education through learning applications, chatbots and automated feedback systems. Fitrianto, et al. (2024) highlighted that the use of AI in designing personalized Arabic learning plans has great potential to improve learning outcomes. Therefore, AI enables the creation of learning experiences tailored to individual needs and preferences, which can increase learner motivation and engagement. AI-based approaches can also increase the accessibility of Arabic language education, especially for those who have limited access to traditional resources.

Recently, Garba and Hassan (2024) conducted a study on use of AI in Learning Arabic Language by Non-Arabic Speakers. Their research findings showed that AI significantly enhances the learning of Arabic language skills. It would be a great idea if these applications were incorporated into teaching Arabic to non-Arabic speakers. Similarly, El Zahraa (2025) opined that AI provides new opportunities to enhance sociolinguistic awareness and Arabic language skills, including listening, speaking, reading, and writing. Research has established that application of AI significantly improves Arabic language education, offering guidance for institutions and policymakers in implementing effective technology strategies through literature evidence and empirical findings (Sa'Idah, 2024). Adoption of artificial intelligence in teaching and learning Arabic Language is often associated with various challenges, varies from different countries. Especially, in non-Arabic speaking country, Nigeria in particular. The teachers faced challenges in adapting AI tools to facilitate teaching and learning, due to inadequate institutional support. Moreover, the unequal distribution of digital resources across Nigeria could widen the educational gap between urban and rural students (Stephen, & Enna, 2025). Furthermore, Adawiyah, R. (2025) opined that several barriers hinder full AI integration facing technical issues, pedagogical, cultural obstacles, inadequate technological infrastructure, limited student preparedness, difficulty among lecturers in adapting to digital tools, scarcity of Arabic-specific AI datasets, and technical limitations of AI applications.

Yatri, et al. (2023) identified the following challenges facing application of AI included limited accessibility due to premium features, connectivity issues, and ethical concerns surrounding AI-generated content. In view of the above, the integration of Artificial Intelligence into the teaching and learning of Arabic Language represents a transformative paradigm shift, gradually replacing traditional pedagogical practices. Existing studies clearly demonstrated that AI enhances personalization, accessibility, and instructional efficiency. Thus, AI tools such as Sakhr (Arabic grammar and proofreading), Farasa AI Toolkit, Noor AI (Arabic NLP tools), AraBERT (Arabic language processing model), GPT-AR (Arabic-language tuned models), ELSA Speak Speechify, Lingvist and AI Speech Trainer can strengthen teaching and learning process for non-Arabic speakers. Against this background, this article aims to examine the prospects and challenges of application of artificial intelligence in teaching and learning Arabic language. This study strives to answer the following research questions:

RQ1: How do Arabic language teachers and learners perceive the use of Artificial Intelligence in teaching and learning Arabic?

RQ2: How do teachers and students describe their experiences of the benefits derived from using AI tools in Arabic language?

RQ3: What challenges do teachers and students face in integrating AI into Arabic language teaching and learning?

Methodology

This study adopts a qualitative, exploratory design to investigate the role of Artificial Intelligence (AI) in teaching and learning Arabic in Ilorin Metropolis. Bhandari (2025) justified the uses of qualitative research as process of collecting and analyzing non-numerical data (e.g., text, video, or audio) to gather in-depth insights into a problem or generate new ideas for research. Purposive sampling was to select six (6) Arabic/Islamic schools distributed across Ilorin Metropolis. The researcher selected 3 Arabic teachers per school, making a

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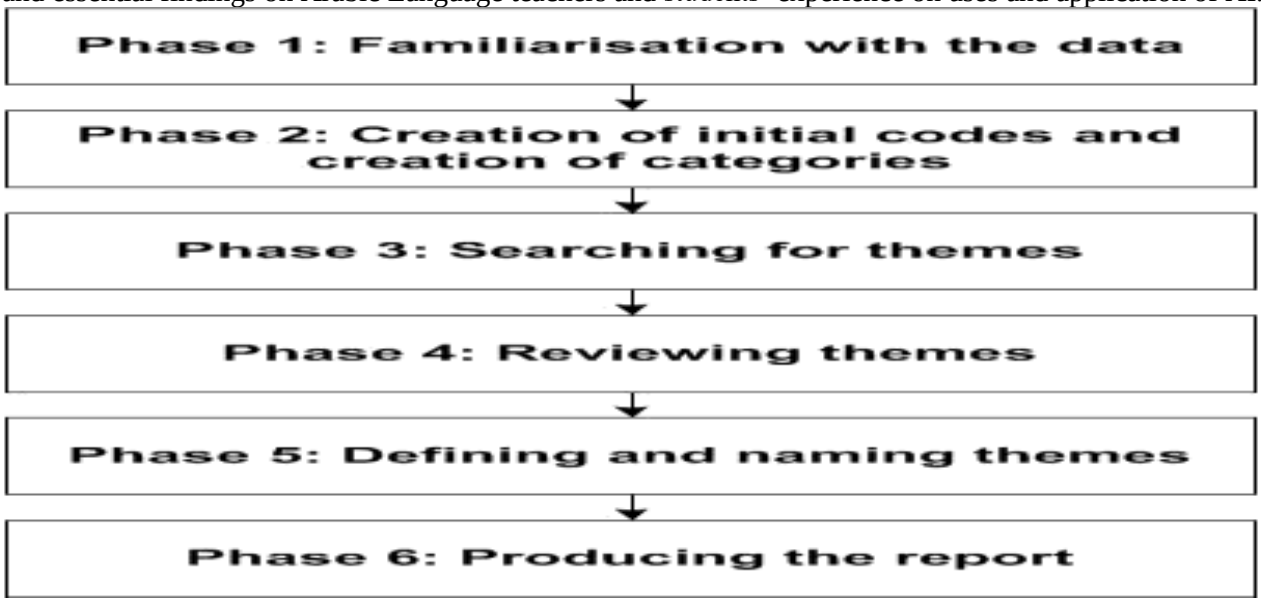
total of 18 teachers. We used the same selection process to select students who voluntarily participated in the study, have a total of 18 students.

Semi-structured interview for data collection, based on contact with participants and their responses were recorded verbatim and transcribed. The interview questions were validated by an independent expert in the Arabic Language through contents validity to ensure accuracy and consistency. We seek permission and approval before we conduct our study from the authorities in the respective schools selected for study. Consent of the participants was sought before the interview. This study adhered to all ethical considerations as well as complied with all regulations guiding the ethics of research. All information provided was treated with the utmost confidentiality. Thematic analysis was used to extract facts, in-depth information, and perspectives from the participants. Braun & Clarke's (2006) six-step data analysis framework was adapted for the study. Thematic analysis provides a robust guide for identifying patterns in qualitative data, involving stages: Familiarization, Coding, Theme Generation, Theme Review, Defining & Naming and Writing Up it presented in Fig. 1. This method helps researchers systematically explore experiences, opinions, and values from data like interviews or surveys. The codes and themes allowed the researcher to understand the raw data by putting names into descriptions and interpretations produced by NVivo 14. The interview sessions conducted were mapped with the research questions. The reason for using thematic analysis is to examine some critical and essential findings on Arabic Language teachers and students' experience on uses and application of AI.



Results

In this section, we presented qualitative analysis of our study.

RQ1: How do Arabic language teachers and learners perceive the use of Artificial Intelligence in teaching and learning Arabic?

Thematic analysis of in person interviews we conducted with Arabic language among teachers (*n*=18) and students (*n*=18) revealed positive perceptions of use of Artificial Intelligence (AI). Five themes emerged.

> ***Theme 1:*** *It enhanced engagement and learning support responses emerged strongly, with most teachers noting that AI-powered tools such as speech recognition, automated vocabulary generators and grammar checkers. Increase student motivation and provide individualized support. Students emphasized AI offer instant feedback, pronunciation correction, and personalized vocabulary practice that makes learning faster and more interactive.*
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> ***Theme 2:*** *Its efficiency and pedagogical improvement reflected teachers' appreciation for AI's ability to automate routine tasks such as grading, lesson creation, and formative*

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assessment allowing them to focus more on higher-level teaching strategies. Students also reported appreciating structured learning paths and AI-generated exercises that align with their proficiency levels.

Theme 3: *Accuracy, cultural limitations, and over-reliance revealed notable concerns: teachers highlighted frequent errors in AI-generated translations, especially around classical Arabic, morphology (Sarf), and culturally embedded expressions. Students also acknowledged such inaccuracies, expressing worry about depending too much on AI at the expense of deep linguistic understanding.*

Theme 4: *Digital competence and accessibility showed divergence: Responses from the interview show that several teachers struggled with low digital literacy or limited institutional support for AI integration, whereas most students felt more technologically confident but complained about data costs, device limitations, and inconsistent internet access.*

Theme 5: *Ethical and authenticity concerns surfaced as both groups worried about plagiarism, reduced originality in student writing, and the potential misuse of AI to complete assignments without genuine learning. Overall, both teachers and students perceive AI as a promising and transformative tool that can enhance Arabic teaching and learning when used critically, supported by training, and balanced with human instruction.*

RQ2: How do teachers and students describe their experiences on benefits derived from using AI tools in Arabic language?

We find five dominant themes regarding the teachers and students' experiences on benefits derived from using AI tools in Arabic language.

Theme 1: *Arabic language teachers noted that AI platforms offer adaptive exercises, differentiated vocabulary sets, and instant pronunciation feedback that accommodate diverse learner abilities. While students reinforced this by describing AI as enabling flexible, "learn-at-my-pace" study and providing continuous guidance outside classroom hours.*

Theme 2: *The qualitative interview revealed that Arabic language teachers frequently rely on AI to automate lesson planning, develop grammar exercises, generate reading passages, and provide rapid formative assessment, which they felt reduces workload and increases creativity. Students also valued these AI-generated resources, noting they receive more varied and engaging materials than before.*

Theme 3: *Students consistently reported improved pronunciation, expanded vocabulary, better listening practice, and clearer grammatical explanations. Teachers echoed that AI speech recognition and conversational chatbots support real-time correction, helping learners gain confidence in speaking and writing.*

Theme 4: *Some of the excerpts from the interview show interactive exercises help sustain students' interest in learning. Teachers' opinions show that AI increases in participation.*

Theme 5: *Some of the excerpts from the interviews revealed that both teachers and students' groups appreciated AI's potential for supporting learning needs. Overall, the experiences reported by teachers and students converge on the idea that AI tools offer meaningful pedagogical benefits ranging from personalized support to enhanced engagement. While expanding opportunities for more flexible, efficient, and skill-focused Arabic language learning.*

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RQ3: What challenges do teachers and students face in integrating AI into Arabic language teaching and learning?

Our qualitative analysis shows responses on challenges facing teachers and students in integrating AI into Arabic language teaching and learning. It revealed five dominant themes:

> ***Theme 1:*** *Technical and poor accessibility barriers were widely reported, with teachers noting unstable internet, limited device availability, and lack of institutional infrastructure, while students highlighted frequent login issues, inconsistent app performance, and difficulties using AI tools with diacritics and complex Arabic morphology.*
>
> ***Theme 2:*** *Insufficient AI literacy and training emerged strongly, as most teachers expressed uncertainty about selecting appropriate AI tools or designing AI-supported learning tasks, whereas many students felt unprepared to use AI responsibly without proper guidance or skill-building.*
>
> ***Theme 3:*** *Third theme concerned pedagogical misalignment and language-specific limitations, including teachers' worries that AI outputs often oversimplified grammar explanations, misinterpreted classical Arabic structures, or generated culturally inappropriate examples. Students similarly reported inaccurate translations, incorrect tashkīl, and limited ability of AI to support advanced rhetorical or literary analysis.*
>
> ***Theme 4:*** *Both teachers and students emphasized ethical and academic concerns, with teachers worried about plagiarism, overdependence on AI, and difficulty assessing authentic student learning, while students expressed fear of making mistakes due to AI's biases, lack of transparency in responses, and uncertainty about what constitutes acceptable AI use in assignments.*
>
> ***Theme 5:*** *Finally, both teachers and students expressed that AI offers clear opportunities, its integration into Arabic language education is hindered by technological, pedagogical, linguistic, and ethical challenges that require structured training, clearer guidelines, and improved tool design tailored to the linguistic complexity of Arabic.*

Discussion of the Findings

First findings of this study revealed positive perceptions toward the integration of Artificial Intelligence in Arabic language learning. This finding corroborates with the research of Chen, et al. (2021) who noted that AI integration in language education enhances learner engagement and provides personalized instructional support. In the same vein, this present finding also supports the work of Almalki (2023), who reported that Arabic language contexts specifically, AI speech recognition and grammar-support tools have been found to improve learner participation and scaffold complex linguistic structures, thereby fostering more interactive learning environments (Holmes, Bialik & Fadel, 2022). Literature demonstrates that AI significantly improves pedagogical efficiency by automating repetitive instructional tasks, including grading, adaptive exercise generation, and lesson planning. This automation allows teachers to devote more time to higher-order pedagogical decisions and differentiated instruction (Holmes et al., 2022; Zawacki-Richter et al., 2019). Also, the results of the study conducted by Totzke (2024) affirmed that the students who used the AI program had a more positive attitude toward AI in their learning.

The finding from the research question two revealed teachers and students' experiences on benefits derived from using AI tools in Arabic language. As evidently shown in the qualitative data. The results conformed with the findings of Treve (2024) that artificial intelligence (AI) in an educational context and its impact on data-driven decision-making related to student engagement, academic success, and creativity. Contextually, considering the necessity of utilization of AI tools in education as a predominant factor in educational practice. This finding supported by research conducted by Kazu and Kuvvetli (2023) explained that the number of AI tools and their capabilities have expanded in the last few years. The use of AI has increased tremendously, too, and it has trickled into education increasingly each day. The authors further buttressed that the effective

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techniques may assist learners by encouraging them to participate actively and think critically. Teachers needed to know what the impact would be on the learning environment and students' academic achievement if AI was determined to be an effective teaching strategy in the curriculum.

The third finding from the research question three revealed the technical and poor accessibility barriers were widely reported, with teachers noting unstable internet, limited device availability, and lack of institutional infrastructure. These findings support the argument of Alsohaimi, M., et al. (2025) who reported that there are several barriers identified facing AI which include limited access to AI technologies, insufficient teacher training, and infrastructural limitations. Kim et al., (2022) observed that many teachers exhibit resistance due to concerns about diminished human interaction, uncertainty about AI's role, and limited familiarity with AI applications. These challenges encompass concerns about losing human interaction, reduced communication between teachers and students, and lack of teacher acquaintance with and credence in understanding and employing AI technologies (Kim et al., 2022).

Conclusion

This study concludes that artificial intelligence plays an increasingly significant role in the teaching and learning of Arabic, offering meaningful opportunities while presenting notable challenges. AI tools enhance engagement, personalize learning, and support language acquisition through instant feedback, pronunciation assistance, and adaptive vocabulary development. Teachers also benefit from increased efficiency in lesson delivery and assessment. However, effective integration remains constrained by limited digital infrastructure, insufficient teacher training, and the scarcity of high-quality Arabic-language AI resources capable of addressing the linguistic complexity of Arabic. Ethical concerns, data privacy issues, and the risk of overreliance on AI further complicate implementation. Overall, the findings suggest that AI has strong potential to transform Arabic language, maximizing its impact requires targeted investment in infrastructure, capacity-building, and the development of culturally and linguistically responsive AI tools.

Recommendations

The article contributes to the body of knowledge by establishing evidence-based insights into the theory and practice of Arabic language on adoption AI and its influence on the teaching and learning. It reveals a complex interplay of factors that shape technology advancement and its adoption for teaching Arabic language. Based on the findings of this study and the conclusion reached, below are the recommendations made:

i. The study establishes the needs for enhancing teacher and student capacity building by providing targeted training on using AI tools effectively in Arabic language teaching and learning.
ii. The study reiterated the needs for developing and implementing Arabic-specific AI resources that address linguistic complexities, improve personalization, and maximize learning benefits.
iii. The study calls for strengthening infrastructure and policy support to overcome technical, ethical, and pedagogical challenges in integrating AI into classrooms.

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