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# THE ROLE OF ARTIFICIAL INTELLIGENCE IN MODERN ARABIC LANGUAGE LEARNING

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## ABSTRACT

*Artificial Intelligence (AI) has become an increasingly important technological development in modern education, particularly in language learning and teaching. The integration of AI-based applications into Arabic language education provides new opportunities for improving students' linguistic abilities, enhancing communication skills, and developing independent learning practices. This study examines the role of artificial intelligence in modern Arabic language learning, focusing on its contribution to vocabulary development, grammatical understanding, reading comprehension, writing proficiency, listening skills, and speaking abilities. It also explores the educational benefits and challenges associated with AI-supported Arabic language instruction. Particular attention is given to generative AI applications, intelligent tutoring systems, automated translation tools, speech recognition technologies, and conversational chatbots. The study proposes a mixed-methods research approach involving Arabic language learners and instructors in higher education institutions. It considers the potential of AI to provide personalized learning experiences, immediate feedback, interactive exercises, and accessible educational resources. Furthermore, the study investigates important limitations, including grammatical inaccuracies, dialectal differences, cultural sensitivity, technological accessibility, and students' dependence on automated systems. The research argues that artificial intelligence can significantly contribute to contemporary Arabic language education when integrated with appropriate pedagogical strategies and teacher supervision. It concludes that AI should complement rather than replace traditional language instruction, encouraging a balanced educational environment that combines technological innovation with human interaction.*

***KEYWORDS:****Artificial Intelligence, Arabic Language Learning, Generative AI, Language Education, ChatGPT, Digital Learning, Personalized Instruction, Arabic Linguistics, Language Acquisition, Educational Technology, Learner Autonomy, Natural Language Processing.*

## INTRODUCTION

Artificial Intelligence has become one of the most influential technological developments in contemporary education. Its increasing application in educational institutions has transformed traditional teaching methods and introduced innovative approaches to knowledge acquisition, classroom interaction, and independent learning. In language education, AI-based technologies provide opportunities for students to practise linguistic skills through interactive exercises, automated feedback, intelligent tutoring systems, and conversational applications. These developments have created new possibilities for improving language instruction and supporting learners with different educational needs. Alkaabi, M. H., & Almaamari, A. S. (2025). found that Arabic language education is also experiencing this technological transformation as teachers and students increasingly explore digital applications to improve language learning outcomes.Arabic is an internationally significant language with a rich linguistic, cultural, religious, and historical background. It is characterized by a complex grammatical system, morphological patterns, diverse vocabulary, and significant differences between Modern Standard Arabic and regional dialects. Students learning Arabic as a second or foreign language frequently encounter difficulties in pronunciation, sentence construction, grammatical agreement, vocabulary acquisition, and reading comprehension. Traditional teaching approaches sometimes provide limited opportunities for individualized practice and immediate correction. Consequently, modern educational technologies have become

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increasingly relevant for addressing these difficulties and creating more flexible learning environments.Artificial intelligence offers several practical opportunities for improving Arabic language learning. AI-supported applications can generate vocabulary exercises, explain grammatical structures, translate sentences, provide pronunciation assistance, and develop interactive conversations. Generative AI applications, particularly conversational language models, allow learners to ask questions and receive explanations according to their individual learning requirements. These systems can also generate reading passages, writing activities, and comprehension questions that correspond to different proficiency levels. Recent research on Arabic language education identifies personalization, feedback, and additional opportunities for practice as important potential benefits of AI integration (Sapawi & Nik Yusoff, 2025).

Another important contribution of AI concerns the development of students' independent learning abilities. In conventional classroom environments, learners generally depend on teachers for explanations, corrections, and additional learning materials. However, AI-powered applications can provide learning support outside classroom hours. Students can practise Arabic vocabulary, examine grammatical structures, develop writing exercises, and engage in simulated conversations at their own pace. This flexibility may encourage learner autonomy and increase opportunities for continuous language practice. AI can therefore function as a supplementary educational resource that supports classroom instruction and independent learning. Al-Shaboul, I. A., Ali, A. A., Kariem, A. I. A., Zarovna, I., Glushchenko, T., & Khasawneh, M. A. S. (2025). Explained that Despite these opportunities, the integration of AI into Arabic language education also creates several challenges. AI-generated Arabic content may contain grammatical inaccuracies, incorrect translations, inappropriate vocabulary, or misunderstandings of cultural expressions. Arabic dialectal diversity creates additional difficulties because many AI applications perform differently when processing formal Arabic and regional varieties. Students may also become excessively dependent on automatically generated answers, potentially reducing their independent thinking and linguistic problem-solving abilities.

Alkaabi and Almaamari (2025) identify concerns regarding dialect processing, cultural authenticity, assessment accuracy, and teacher preparation in AI-supported Arabic instruction.Furthermore, successful AI integration requires teachers to develop appropriate technological and pedagogical knowledge. Teachers must understand how to select suitable applications, evaluate AI-generated materials, identify incorrect information, and guide students toward responsible technology use. Educational institutions should also establish policies concerning academic integrity, student privacy, accessibility, and the appropriate use of AI in classroom activities. Therefore, the educational value of artificial intelligence depends not only on technological availability but also on the quality of instructional planning and human supervision.In this context, the present study examines the role of artificial intelligence in modern Arabic language learning by exploring its potential educational benefits, practical applications, limitations, and implications for teaching practices. It focuses on the relationship between AI-supported learning and the development of Arabic linguistic competencies. The study also considers how artificial intelligence can contribute to more interactive, personalized, and accessible learning environments while maintaining the essential role of teachers in language education.

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## RESEARCH QUESTION

1. How does artificial intelligence contribute to improving Arabic language learning skills, learner autonomy, and educational experiences among modern Arabic language learners?

## RESEARCH OBJECTIVES

1. To examine the role of artificial intelligence in improving students' Arabic language learning skills.

## LITERATURE REVIEW

Artificial intelligence has introduced significant changes in contemporary educational practices by providing technologies that support personalized instruction, automated assessment, interactive communication, and independent learning. In language education, AI applications can process linguistic information, generate educational materials, identify language errors, and provide feedback according to learners' needs. These capabilities have encouraged researchers and educators to investigate the relationship between technological innovation and language acquisition. AI-supported learning environments can offer additional opportunities for students to practise language skills beyond traditional classroom activities.The development of generative AI has further expanded the possibilities of technology-assisted language instruction. Unlike conventional educational software that primarily follows predetermined exercises, generative AI systems can produce responses based on individual questions and learning contexts. Allaithy, A., & Zaki, M. (2026). Explains that Students can request grammatical explanations, vocabulary examples, sentence corrections, translations, and writing suggestions. Such flexibility makes conversational AI potentially useful for learners who require repeated explanations or additional practice. However, educational effectiveness depends on the accuracy and relevance of generated responses.The integration of technology into Arabic curricula has also become an important research area. Sapawi and Nik Yusoff (2025) examine recent developments in technology-supported Arabic language education through a systematic review. Their research emphasizes the importance of aligning technological applications with curriculum objectives, instructional strategies, and cultural considerations. This perspective suggests that technology should not be introduced merely because it is available. Instead, educators should evaluate whether particular applications address genuine language-learning requirements.

Vocabulary acquisition is an essential component of successful Arabic language learning. Students require a substantial vocabulary to understand written texts, communicate effectively, participate in classroom discussions, and develop advanced linguistic proficiency. However, Arabic vocabulary learning can be challenging because words may change according to grammatical structures, morphological patterns, contextual meanings, and derivational relationships. Learners must understand not only individual word meanings but also how words function within sentences and different communicative situations.AI applications can support vocabulary development by generating word lists, definitions, example sentences, contextual exercises, and vocabulary quizzes. Students can request explanations of unfamiliar words and examine their usage in different contexts. Conversational AI can also generate practice activities based on specific themes, proficiency levels, or academic requirements. Karataş, F., Abedi, F. Y., Ozek Gunyel, F., Karadeniz, D., & Kuzgun, Y. (2024). revealed that These features may help learners develop vocabulary

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through repeated exposure and contextualized practice.Another important benefit is the possibility of individualized vocabulary instruction. Students who struggle with particular lexical categories can request additional explanations and exercises. For example, beginners may focus on everyday expressions, classroom vocabulary, and basic verbs, while advanced learners may investigate academic terminology and specialized expressions. AI-generated learning activities can therefore provide supplementary practice according to students' individual requirements.Nevertheless, AI-generated vocabulary materials require careful evaluation. Some systems may provide incorrect meanings, unsuitable examples, or translations that fail to reflect contextual differences. Teachers should encourage students to consult reliable dictionaries and authentic Arabic texts when verifying unfamiliar vocabulary. The educational effectiveness of AI-based vocabulary development consequently depends on combining technological support with linguistic accuracy and instructional guidance.

Arabic grammar represents one of the most demanding aspects of learning the language. Students must understand grammatical categories, sentence structures, verb conjugations, agreement, case endings, and the relationship between words within sentences. The distinction between nominal and verbal sentences, the use of particles, and the rules of grammatical inflection may create considerable difficulties for learners, particularly those whose first languages have different grammatical systems.Artificial intelligence can provide additional explanations of Arabic grammatical structures through interactive questioning and automated examples. Learners can submit sentences and request explanations concerning grammatical errors, word functions, sentence construction, and morphological patterns. AI applications can also generate exercises involving verb conjugation, pronoun usage, adjective agreement, and sentence transformation. Such activities may help students practise grammar repeatedly without depending entirely on classroom instruction.Conversational AI can also support grammatical understanding through dialogue. Students can ask follow-up questions when an explanation is unclear and request additional examples of a particular grammatical rule. This process can encourage active engagement with linguistic concepts rather than passive memorization. The opportunity to receive explanations in different forms may be especially useful for learners who require alternative approaches to understanding difficult grammatical structures.However, AI systems do not always provide completely accurate grammatical explanations. Arabic grammatical analysis frequently depends on contextual meaning, syntactic relationships, and morphological interpretation.

Reading comprehension is an important language-learning skill because it enables students to interpret written information, understand vocabulary in context, identify grammatical relationships, and develop broader linguistic knowledge. Arabic learners may experience difficulties when reading texts containing unfamiliar vocabulary, complex sentence structures, idiomatic expressions, or culturally specific references. These difficulties can reduce reading confidence and limit students' ability to understand authentic Arabic materials.AI-supported applications can assist reading comprehension by simplifying complex passages, explaining unfamiliar expressions, generating comprehension questions, and identifying the main ideas of texts. Students can request explanations of difficult sentences and compare different interpretations of written passages. Such applications may also generate reading materials according to specific proficiency levels, allowing beginners and advanced learners to work with appropriately challenging texts.Personalized reading activities can provide additional opportunities for independent study. For example, learners may request short passages about education, history, culture, science, or everyday communication. AI applications can generate vocabulary explanations and questions that

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encourage students to identify supporting details and understand textual organization. These activities may help learners develop reading confidence and improve their ability to engage with different types of Arabic texts.Nevertheless, reading materials generated by AI should be evaluated for linguistic quality, factual accuracy, and cultural appropriateness. Simplified texts may sometimes remove important grammatical features or produce unnatural expressions.

Writing proficiency requires learners to understand vocabulary, grammar, sentence organization, punctuation, spelling, and textual coherence. Arabic writing can be particularly challenging because learners must consider morphological agreement, syntactic relationships, word order, and appropriate written expression. Students may understand individual grammatical rules but struggle to apply them consistently when producing paragraphs or longer compositions. Lo, C. K., Yu, P. L. H., Xu, S., Ng, D. T. K., & Jong, M. S. Y. (2024). Elaborated on AI applications can support writing development by providing suggestions concerning sentence construction, vocabulary selection, grammar, spelling, and textual organization. Students can submit written paragraphs and request feedback about clarity, grammatical accuracy, and coherence. Generative AI can also provide writing prompts, sample paragraphs, and alternative sentence structures. These features may encourage learners to revise their work and develop greater awareness of linguistic errors.Another potential contribution is the opportunity to practise different writing genres. Learners can request exercises involving descriptive writing, narrative paragraphs, academic introductions, summaries, and formal communication. AI-generated feedback may help students recognize repeated mistakes and understand how particular linguistic choices influence meaning. Such activities can support writing practice when they are integrated into teacher-guided instructional activities.However, excessive dependence on AI-generated writing may negatively affect independent writing development. Students who submit automatically generated paragraphs without critically evaluating them may fail to develop their own linguistic abilities. Furthermore, AI-generated Arabic may contain stylistic inconsistencies or grammatical errors. Therefore, AI should be used primarily as a feedback and revision resource, while students remain responsible for producing and evaluating their own written work.

## METHODOLOGY

The proposed study adopts a mixed-methods methodology to investigate the role of artificial intelligence in modern Arabic language learning. This approach combines quantitative and qualitative research techniques to develop a comprehensive understanding of students' experiences, learning practices, and perceptions regarding AI-supported language instruction. The quantitative component will examine students' patterns of AI usage, perceived educational benefits, frequency of application use, and opinions concerning improvements in different Arabic language skills. The qualitative component will explore students' and teachers' experiences in greater depth, particularly their understanding of the opportunities and limitations associated with AI integration. The proposed participants will consist of approximately 100 undergraduate students enrolled in Arabic language courses at selected higher education institutions, together with approximately 10 Arabic language instructors. Participants will be selected through purposive sampling to ensure that they have relevant experience with Arabic language learning and educational technology. Data will be collected through structured questionnaires, semi-structured interviews, and, where institutional

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permission is available, classroom observations. The questionnaire will include questions concerning the frequency of AI usage, the applications employed, the linguistic skills practised, students' perceived learning improvements, and challenges associated with technological applications. Interviews will provide additional information about teachers' experiences with AI-generated educational materials, automated feedback, grammatical explanations, and classroom integration. The study will also examine relevant academic literature published between 2023 and 2025 to establish a theoretical and empirical foundation. Participants will be informed about the research objectives, and their participation will remain voluntary. Confidentiality, informed consent, and responsible data management will be maintained throughout the research process. The collected information will be organized systematically to identify patterns of AI use and evaluate its perceived contribution to Arabic language education.

## RESEARCH DESIGN

The research will employ an explanatory sequential mixed-methods design in which quantitative data collection and analysis will precede qualitative investigation. This design is appropriate because it enables the researcher to identify general patterns in students' AI usage before examining the experiences and explanations underlying those patterns. During the first phase, questionnaires will be distributed among undergraduate Arabic language students to investigate their experiences with artificial intelligence. The questionnaire will examine how frequently students use AI applications, which language-learning activities they perform, and which linguistic competencies they believe benefit most from technological assistance. Students will also be asked about the accuracy of AI-generated explanations, their confidence in using automated feedback, and the difficulties they encounter when learning Arabic through digital applications. During the second phase, selected students and Arabic language instructors will participate in semi-structured interviews. These interviews will explore how AI applications influence independent learning, classroom participation, grammatical understanding, writing development, and communication practice. The research design will also incorporate a review of relevant scholarly publications to compare participants' experiences with established findings in language education research. Quantitative and qualitative findings will subsequently be integrated to identify similarities, differences, and complementary explanations. Particular attention will be given to distinguishing students' perceptions from objectively measured improvements in language proficiency.

## DATA ANALYSIS

The collected data will be analyzed using quantitative and qualitative procedures to investigate the contribution of artificial intelligence to modern Arabic language learning. Quantitative questionnaire responses will initially be organized and entered into an appropriate statistical software package, such as SPSS or an equivalent application. Descriptive statistical techniques, including frequencies, percentages, means, and standard deviations, will be used to summarize participants' responses and identify common patterns in AI usage. The analysis will examine the frequency with which students employ artificial intelligence for vocabulary development, grammatical explanations, translation, reading comprehension, writing assistance, listening activities, and speaking practice. Additional attention will be given to students' perceptions of personalized learning, immediate feedback, educational accessibility, and independent study. Where appropriate, comparisons may be

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conducted between different student groups according to their proficiency levels, previous technological experience, and frequency of AI application use. If the study includes validated learning assessments, inferential statistical techniques can be applied to investigate differences between pre-intervention and post-intervention performance. Qualitative interview data will be transcribed, organized, and examined through thematic analysis. The researcher will become familiar with the interview transcripts, identify meaningful statements, develop initial codes, and organize related codes into broader themes. Potential themes may include personalized learning support, improved access to explanations, increased opportunities for practice, grammatical inaccuracies, dialectal limitations, technological dependence, and teacher supervision. The qualitative analysis will also examine how students and instructors understand the relationship between traditional teaching and AI-assisted educational activities. Finally, the quantitative and qualitative results will be compared through methodological triangulation.

## FINDINGS

The anticipated findings suggest that artificial intelligence may play a valuable role in supporting modern Arabic language learning by providing additional educational resources, personalized explanations, and opportunities for independent practice. Students are expected to identify conversational AI applications, automated translation systems, digital dictionaries, and grammar-support tools as useful resources for completing language-learning activities. These applications may help learners understand unfamiliar vocabulary, examine grammatical structures, and develop confidence when working with Arabic texts. The findings anticipated from the literature suggest that AI-supported educational environments can make language practice more accessible and flexible, particularly when students require additional assistance outside classroom hours.Another anticipated finding concerns vocabulary acquisition. AI applications may help students develop vocabulary knowledge through contextual examples, definitions, exercises, and repeated practice. Learners may benefit from the ability to request explanations of unfamiliar words and explore their meanings in different sentences. However, students may also encounter incorrect translations or inappropriate contextual examples, demonstrating the importance of teacher guidance and independent verification.The research may also identify positive perceived contributions to Arabic grammar learning. Interactive explanations and automated examples can help students understand grammatical rules and identify possible sentence-construction errors. Learners may appreciate the opportunity to ask repeated questions without feeling embarrassed about their difficulties. Nevertheless, the accuracy of grammatical explanations is likely to remain an important concern, especially when dealing with complex syntactic structures and morphological patterns.In relation to reading and writing, AI applications may provide useful assistance through text simplification, comprehension exercises, vocabulary explanations, paragraph development, and writing feedback. Students may find these applications helpful when organizing their ideas and identifying grammatical problems in written assignments.

## CONCLUSION

Artificial intelligence has the potential to become an important component of modern Arabic language education by introducing innovative approaches to teaching, learning, and linguistic practice. The present study examines how AI-supported applications can contribute to the development of Arabic language competencies, including vocabulary acquisition,

grammatical understanding, reading comprehension, writing proficiency, listening skills, and speaking abilities. The discussion indicates that AI technologies offer several educational opportunities through personalized explanations, automated feedback, interactive exercises, conversational practice, and accessible digital learning resources. These capabilities may help students overcome certain language-learning difficulties and develop greater independence in their educational activities.One of the most important contributions of artificial intelligence is its ability to provide additional learning opportunities according to individual student requirements. Learners can practise difficult grammatical structures, request vocabulary explanations, develop writing exercises, and engage in simulated conversations whenever educational support is needed. Such flexibility can complement classroom instruction and encourage continuous language practice. AI applications may also help teachers prepare supplementary learning materials, develop assessment exercises, and identify areas requiring additional instructional attention.However, the integration of artificial intelligence into Arabic language learning must be approached carefully. Arabic linguistic complexity, morphological variations, grammatical structures, and dialectal differences create challenges for automated language-processing systems. Incorrect translations, inaccurate grammatical explanations, and culturally inappropriate responses may negatively influence students' understanding if these outputs are accepted without verification.

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