

Artificial Intelligence-Assisted Arabic Language Learning in Islamic Schools: Teachers' Readiness, Challenges, And Pedagogical Opportunities

Mubarak Fatahillah

Sekolah Tinggi Agama Islam Kuningan, Indonesia

Email: mubarakfatahillah@gmail.com

ABSTRACT

This study investigates the potential of Artificial Intelligence (AI) to enhance Arabic language learning in madrasahs Al Falah. Using a mixed-methods approach, both qualitative and quantitative data were collected to examine the impact of AI on Arabic language education. The qualitative phase involved in-depth interviews, focus groups, and case studies with teachers, students, and administrators, exploring their perceptions, experiences, and challenges related to AI integration. The quantitative phase included a survey assessing attitudes towards AI in language learning. Results reveal that AI offers significant benefits, including personalized learning, real-time feedback, and improved student engagement. However, challenges such as lack of training, insufficient infrastructure, and funding limitations hinder its full implementation. The study concludes that while AI has the potential to revolutionize Arabic education in madrasahs Al Falah, its successful adoption requires addressing these challenges and providing proper support to educators.

Keywords: artificial intelligence (AI); arabic language learning; educational technology; personalized learning

INTRODUCTION

The advent of Artificial Intelligence (AI) has revolutionized various industries, including education. In recent years, AI has gained significant attention for its potential to transform traditional teaching methods, personalize learning, and improve the quality of education across different disciplines. In the context of language learning, AI presents numerous opportunities, especially in the teaching of Arabic, a language of great religious and cultural significance (Al-Rahmi et al., 2019). Arabic is the language of the Qur'an and the Hadith, making it essential for students in Islamic schools, particularly in madrasahs Al Falah, to master it. Despite its importance, Arabic education in many madrasahs Al Falah faces challenges such as outdated teaching methods, a shortage of qualified teachers, and limited access to educational technologies (Huang & Lim, 2021).

Arabic, as the language of the sacred texts, holds a central place in Islamic education, where it is taught as both a medium of religious instruction and a cultural cornerstone (Baker & Siemens, 2019). However, the teaching of Arabic in madrasahs Al Falah is often confined to traditional methods, relying heavily on rote memorization and passive learning. These methods, while effective to some extent, fail to engage students actively, particularly in addressing the diverse learning needs and proficiency levels of students (Zhou & others, 2020). Moreover, these challenges are exacerbated in rural and underfunded madrasahs Al Falah where access to qualified Arabic teachers and modern resources is limited (Fatahillah et al., 2023). AI, however, has the potential to address these challenges by providing more interactive, personalized, and adaptive learning experiences.

AI technologies, such as natural language processing (NLP), speech recognition, and machine learning (ML), can significantly enhance the learning experience by enabling real-time feedback, personalized learning paths, and more dynamic interactions (Al-Seghayer, 2020). For example, AI-based tools can help students practice pronunciation, correct grammatical errors, and build vocabulary through interactive platforms. These tools can be particularly beneficial in the teaching of Arabic, which has a complex grammar structure and pronunciation rules that can be difficult for non-native speakers to master (Sana & others, 2020). Additionally, AI-driven platforms can adapt to each student's learning pace, providing them with personalized lessons based on their strengths and weaknesses, which is essential for fostering effective learning in language education (Maoti et al., 2025).

AI can play a crucial role in transforming Arabic language education by offering personalized learning experiences. Traditional classrooms often struggle to cater to the diverse learning needs of students, particularly in madrasahs Al Falah where students come from varying socio-economic backgrounds and may have different levels of familiarity with the Arabic language (Hassan & Saleh, 2020). AI-powered platforms, such as language-learning apps and adaptive learning systems, have the ability to assess a student's progress and adjust the level of difficulty of the content to match their proficiency (Al-Rahmi et al., 2019). This personalized approach not only enhances learning outcomes but also boosts student engagement by providing them with challenges that are tailored to their specific needs.

In addition to personalized learning, AI can also facilitate the practice of speaking and listening skills, which are often the most challenging aspects of language learning. Speech recognition technology allows students to practice pronunciation and speaking in Arabic, with immediate feedback on their accuracy (Binns, 2020). This instant correction helps students build confidence and improves their speaking abilities, which are essential in a language like Arabic, where pronunciation plays a significant role in comprehension. AI systems can assess students' speech patterns and identify areas for improvement, guiding them towards better pronunciation and fluency (Martínez-Maldonado & others, 2020). Moreover, AI systems that incorporate chatbots can simulate real-world conversations, providing students with opportunities to practice their conversational skills in a controlled environment (Hassan & Saleh, 2020).

AI's ability to create interactive learning environments also addresses one of the key limitations of traditional Arabic education: the lack of engagement. In many madrasahs Al Falah, students often face a passive learning experience that does not encourage active participation. AI, on the other hand, can facilitate dynamic and interactive lessons, where students engage with the material, receive real-time feedback, and practice their skills in a more immersive environment (Baker & Siemens, 2019). For instance, AI-powered platforms can use gamification techniques to make language learning more fun and engaging, providing students with rewards and incentives for completing tasks and challenges related to Arabic grammar, vocabulary, and speaking (Huang & Lim, 2021).

Furthermore, AI-based platforms can offer 24/7 accessibility, allowing students to continue learning and practicing Arabic outside of the classroom. This flexibility is especially beneficial for students in remote areas who may not have consistent access to Arabic teachers or language learning resources. AI tools provide students with opportunities to practice their skills at any time, reinforcing what they have learned in class and improving retention (Ward

et al., 2025). For example, students can use AI-powered mobile apps to review vocabulary, complete interactive lessons, and practice speaking, all from the comfort of their own homes. This convenience makes language learning more accessible to a wider range of students and promotes continuous learning.

Despite the many potential benefits, the implementation of AI in Arabic language education faces several significant challenges. One of the primary obstacles is the lack of technological infrastructure in many madrasahs Al Falah, particularly those in underdeveloped regions. Many madrasahs Al Falah do not have access to the necessary hardware, software, or reliable internet connectivity to support AI-powered learning tools (Fatahillah & Hafidhoh, 2025). Without the appropriate infrastructure, the effectiveness of AI tools is severely limited, and many students miss out on the opportunity to benefit from these innovative technologies. Additionally, some madrasahs Al Falah may face financial constraints that prevent them from investing in the required technologies, further limiting their ability to integrate AI into their educational practices.

Another major challenge is the lack of teacher training in AI technologies. While many teachers in madrasahs Al Falah are skilled in teaching traditional Arabic language lessons, they may not have the necessary expertise to integrate AI tools into their classrooms effectively. Teachers may be unfamiliar with how to use AI-powered systems or how to incorporate them into their lesson plans. Professional development programs focused on AI integration in the classroom are crucial to ensuring that teachers are adequately prepared to use these tools (Sana & others, 2020). Without proper training, teachers may struggle to maximize the potential of AI technologies, which could result in underutilization or ineffective implementation.

In addition to technological and training challenges, there are ethical concerns associated with the use of AI in education. One of the primary concerns is the issue of data privacy. AI-powered tools require access to vast amounts of student data, including personal information, learning progress, and assessment results. Ensuring the security and privacy of this data is crucial to maintaining trust in AI-based educational tools (Binns, 2020). Moreover, there is a risk that AI systems could reinforce biases in language assessment. If AI algorithms are not carefully designed and tested, they may inadvertently favor certain dialects or accents of Arabic over others, leading to unfair assessments of students' language proficiency (Cummings et al., 2021). Addressing these ethical concerns is essential to ensuring that AI is used responsibly in education.

To successfully implement AI in Arabic language education, several strategies must be adopted. First, it is crucial to improve the technological infrastructure in madrasahs Al Falah. Governments, educational institutions, and private organizations should work together to provide the necessary resources, such as computers, internet connectivity, and AI-powered learning tools, to schools in both urban and rural areas (Ashraf & Zia, 2021). In addition to providing infrastructure, there is a need for teacher training programs that focus on the integration of AI into the classroom. These programs should equip teachers with the knowledge and skills needed to use AI tools effectively and to incorporate them into their teaching methods (Al-Rahmi et al., 2019).

Moreover, culturally relevant AI tools should be developed to ensure that Arabic language education is aligned with the cultural and religious context of the students. AI-powered platforms should incorporate Islamic texts, cultural references, and religious teachings

to make the learning experience more meaningful and engaging for students (Hassan & Saleh, 2020). The development of such tools requires collaboration between educators, AI developers, and cultural experts to ensure that the technology is tailored to the unique needs of Arabic language learners in Islamic schools.

Finally, ethical guidelines should be established to address issues such as data privacy, fairness, and AI bias. These guidelines should ensure that AI tools are used responsibly, with a focus on protecting students' data and ensuring that AI assessments are accurate and unbiased (Binns, 2020). By establishing clear ethical frameworks, educational institutions can ensure that AI is used in a way that benefits all students, regardless of their background or proficiency level.

Although previous studies have discussed AI integration in language learning, limited research has specifically examined the readiness of teachers, institutional challenges, and pedagogical opportunities within Arabic language education in madrasahs Al Falah. Existing studies predominantly focus on general technology adoption without addressing the socio-religious and instructional context of Islamic schools. Therefore, this study contributes novelty by integrating pedagogical, technological, and institutional perspectives to evaluate how AI can support Arabic language learning in madrasah environments while maintaining culturally relevant educational practices.

METHOD

This study aims to investigate the integration of Artificial Intelligence (AI) in Arabic language learning within madrasahs Al Falah (Islamic schools). It seeks to explore the opportunities and challenges faced by educators, students, and administrators in adopting AI tools for teaching Arabic. In line with this goal, the study adopts a mixed-methods approach, combining qualitative and quantitative research techniques. This approach is well-suited for the research, as it allows for a comprehensive understanding of the subject, enabling the capture of both in-depth personal experiences and broader generalizable trends (Creswell, 2020). The mixed-methods approach provides a robust framework for examining complex educational phenomena, offering both detailed insights and the ability to quantify patterns across a larger sample (Sugiyono, 2024).

Research Design

The research is designed as descriptive-exploratory, aiming to describe the current state of AI integration in Arabic language teaching and explore the various factors influencing its adoption. According to Creswell & Creswell (2020), a descriptive-exploratory design is appropriate when the goal is to understand the "why" and "how" of a phenomenon. This design allows for a detailed understanding of how AI is being integrated into madrasahs Al Falah and the perceived benefits and challenges from the perspective of various stakeholders, including teachers, students, and administrators.

The study will proceed in two main phases:

Qualitative Data Collection: This phase involves gathering rich, narrative data from in-depth interviews, focus groups, and case studies to explore how AI is perceived and experienced by teachers, students, and administrators. Through qualitative inquiry, the study seeks to

understand the personal and contextual factors that shape the adoption of AI in Arabic language learning.

Quantitative Data Collection: This phase aims to measure the perceptions of a larger sample of participants regarding AI's effectiveness and its role in language learning. A survey will be distributed to a broader group of teachers, students, and administrators across multiple madrasahs Al Falah to quantify their attitudes and readiness for AI integration.

Sampling Method

For the qualitative phase, the study will use purposive sampling, a technique where participants are selected based on their relevant experience and knowledge of the research topic (Sugiyono, 2024). The participants will be chosen because they have specific insights into the use of AI in Arabic language education. In this phase, the sample will include:

1. Arabic language teachers who are currently teaching Arabic in madrasahs Al Falah and have some experience with or awareness of AI tools in education.
2. Administrators who are responsible for curriculum development or the adoption of educational technologies within the madrasah.
3. AI experts or education technology specialists who can provide valuable insights into the role of AI in language education.

For the quantitative phase, a random sampling method will be employed to ensure that the survey data is representative of a wider population (Creswell & Creswell, 2018). The survey will be distributed to:

1. 100 Arabic language teachers working in different madrasahs Al Falah.
2. 200 students currently enrolled in Arabic language courses.
3. 50 administrators overseeing educational programs or technological initiatives in madrasahs Al Falah al falah.

This random sampling will allow for generalizability and help ensure that a wide range of experiences and perspectives are captured.

Data Collection Methods

In-depth Interviews will be conducted with teachers, administrators, and AI experts. These interviews will follow a semi-structured format, allowing participants to express their views and experiences while also addressing specific topics related to AI integration in Arabic language education. The key interview questions will include:

1. What are your thoughts on integrating AI into Arabic language teaching?
2. What do you see as the main advantages of using AI tools in the classroom?
3. What challenges have you encountered or expect to encounter when using AI in education?

Focus Groups will be held with students to gather their opinions on how AI-based tools could improve their learning of Arabic. Students will be asked about their experiences with technology in the classroom, their expectations for AI tools, and any concerns they have regarding the use of AI in their education. The goal of these focus groups is to capture the

students' personal experiences and understand how they feel AI could help or hinder their learning of Arabic.

Case Studies will be conducted in madrasahs Al Falah that have already begun integrating AI into their Arabic language programs. These case studies will involve observations of AI-driven classes, interviews with teachers and administrators, and an examination of the outcomes of AI implementation in real classroom settings. Case studies provide an in-depth look at the practical challenges and successes of using AI in educational settings (Creswell, 2020).

For quantitative data, a survey will be designed to measure participants' perceptions of AI's effectiveness, its perceived impact on language learning, and the barriers to its adoption. The survey will use a Likert scale to measure levels of agreement with statements such as "AI can improve my ability to teach Arabic" or "I am confident in using AI-based learning tools." Open-ended questions will also allow participants to provide additional insights into their experiences and challenges with AI. The survey will be administered to teachers, students, and administrators across various madrasahs Al Falah.

To ensure the trustworthiness of the findings, the study applied several validity and reliability procedures. Qualitative data credibility was strengthened through triangulation of interviews, focus groups, and case studies, while member checking was conducted with selected participants to confirm the accuracy of interpretations. For the quantitative phase, the survey instrument underwent content validity review by educational technology experts and reliability testing using Cronbach's Alpha to ensure internal consistency. Ethical considerations were also addressed by obtaining informed consent from all participants prior to data collection, ensuring confidentiality of responses, and explaining that participation was voluntary. Operationally, teacher readiness refers to teachers' preparedness and competence in utilizing AI-based learning tools, while pedagogical opportunities refer to the educational benefits generated through AI integration, including adaptive learning, interactive engagement, and real-time feedback.

Data Analysis

The qualitative data will be analyzed using thematic analysis, as described by Creswell & Creswell (2020). This approach will involve identifying, analyzing, and reporting patterns within the data. Themes will be generated from the responses to interviews, focus groups, and case studies, and these themes will provide insight into the perceptions and experiences of teachers, students, and administrators regarding AI. Thematic analysis allows the researcher to focus on both the explicit content and the underlying meanings in participants' responses.

For the quantitative data, descriptive statistics will be used to summarize the survey results. Measures such as mean scores and frequency distributions will provide an overview of how participants perceive AI in Arabic language education. Inferential statistics like Chi-square tests and t-tests will be used to identify significant differences between groups (e.g., teachers vs. students, urban vs. rural madrasahs Al Falah) in their attitudes toward AI. Correlation analysis will also be conducted to explore relationships between variables, such as the level of familiarity with technology and the willingness to adopt AI tools.

RESULT AND DISCUSSION

Results

The results of this study are derived from both the qualitative and quantitative data collected through interviews, focus groups, case studies, and surveys conducted across various madrasahs Al Falah. These results reflect the perceptions, experiences, and attitudes of teachers, students, and administrators towards the integration of Artificial Intelligence (AI) into Arabic language education.

Qualitative Findings

From the in-depth interviews conducted with teachers and administrators, it was evident that the majority recognized the potential of AI in improving Arabic language learning. Teachers particularly emphasized how AI tools, such as speech recognition systems and interactive apps, could help students enhance their pronunciation and vocabulary. One teacher mentioned, "AI allows for instant feedback, especially with pronunciation, which is crucial in learning Arabic." Despite the optimism, challenges such as lack of adequate training for teachers and insufficient infrastructure in many madrasahs Al Falah were common concerns. Several teachers highlighted that while they were excited about AI's potential, they felt unprepared to integrate these technologies into their teaching effectively.

Administrators, on the other hand, expressed a strong interest in AI's ability to personalize learning and provide real-time feedback. However, they also noted the cost and technical expertise required to implement such systems. One administrator explained, "We recognize the value AI can bring, but the budget constraints and the need for specialized staff are significant barriers."

The focus groups with students revealed that there was a high level of interest in using AI for language practice. The majority of students found AI tools engaging, particularly those with gamified features. One student stated, "AI makes learning fun, especially with the games and quizzes; it feels less like studying and more like playing." However, concerns about data privacy and the over-reliance on technology were raised by a few students, who expressed doubts about AI's ability to understand the cultural and emotional nuances of language learning. In terms of case studies, madrasahs Al Falah that had begun using AI tools reported positive outcomes in terms of student engagement and academic performance. Teachers in these madrasahs Al Falah observed that students who used AI tools regularly showed improved test scores and greater confidence in speaking Arabic. However, it was also noted that the full benefits of AI were not being realized due to inconsistent usage of the tools and the lack of integration with traditional teaching methods.

Quantitative Findings

The survey results confirmed many of the qualitative findings, but also provided some statistical insights. The survey included responses from 100 teachers, 200 students, and 50 administrators. Key quantitative findings included:

The quantitative findings indicate a generally positive perception toward AI integration across all participant groups. The relatively high percentage of agreement among teachers and students demonstrates that AI-assisted learning is perceived not only as a technological innovation but also as a pedagogical support system capable of improving language acquisition

outcomes. Comparative analysis between teachers and students further suggests that students tend to demonstrate higher acceptance of AI-based learning tools due to their familiarity with digital learning environments.

1. 72% of teachers agreed that AI could enhance students' learning experiences, particularly through real-time feedback and adaptive learning tools.
2. 85% of students expressed interest in using AI for language practice, with the majority favoring tools that offer personalized learning paths and speech correction.
3. However, 60% of teachers reported a lack of proper training in using AI tools, while 55% of administrators cited funding limitations as a significant obstacle to AI adoption.

In terms of AI's effectiveness, the data revealed that AI-powered pronunciation tools were rated the highest in terms of usefulness. 78% of students felt that these tools helped improve their spoken Arabic. Conversely, only 50% of teachers believed that AI could replace traditional teaching methods, emphasizing that human interaction remained essential for effective language learning.

Discussion

The findings of this study highlight both the opportunities and challenges associated with the integration of AI into Arabic language education in madrasahs Al Falah.

Opportunities for AI in Arabic Language Education

One of the primary benefits of AI in Arabic language learning is its ability to provide personalized learning experiences. AI tools can adapt to each student's learning pace, offering them tailored exercises and instant feedback. This is particularly valuable in the context of Arabic, where students often have varying levels of proficiency and come from diverse linguistic backgrounds. As noted by Al-Rahmi et al. (2019), AI's ability to customize learning materials according to the student's individual needs makes it an effective tool for language learning. In this study, teachers and administrators acknowledged that AI's adaptive learning capabilities could significantly enhance the effectiveness of Arabic language instruction.

AI's ability to provide real-time feedback, especially on pronunciation, is another key advantage. Arabic, with its unique sounds and phonetics, can be difficult for non-native speakers to master. Speech recognition technologies used in AI tools enable students to practice pronunciation and receive instant corrections, improving their speaking skills. The survey results show that 78% of students found AI-powered pronunciation tools highly beneficial, which is consistent with findings from Hassan & Saleh (2020), who found that such tools lead to noticeable improvements in pronunciation accuracy.

AI also increases accessibility to quality Arabic language education, particularly in remote areas. Many madrasahs Al Falah, especially in rural regions, face difficulties in recruiting qualified Arabic teachers. AI can help bridge this gap by providing access to language learning tools that are both scalable and cost-effective. As highlighted by Zhou et al. (2020), AI-powered applications are available 24/7, allowing students to continue learning outside the classroom and practice at their own pace.

Challenges to AI Integration

While the potential of AI in Arabic language education is significant, several challenges must be addressed for effective implementation. The most critical barrier identified in this study is the lack of teacher training. Despite their enthusiasm for AI, many teachers expressed concerns about their ability to integrate these tools into their teaching methods. As noted by Creswell & Creswell (2020), training is essential for ensuring that teachers can use new technologies effectively. Without adequate professional development, teachers may not fully understand how to utilize AI tools to enhance their students' learning experiences.

Another major challenge is the lack of infrastructure in many madrasahs Al Falah. Funding limitations and insufficient technological resources were consistently mentioned as obstacles by both administrators and teachers. Many madrasahs Al Falah in rural areas lack the necessary hardware, software, and internet connectivity to support AI-driven learning tools. As Sugiyono (2024) highlights, financial constraints are a common challenge in educational settings, particularly in developing countries. To address this issue, governments and educational institutions must invest in improving the technological infrastructure of madrasahs Al Falah.

From a pedagogical perspective, the findings suggest that AI should complement rather than replace traditional Arabic language instruction. Teachers continue to play an essential role in facilitating cultural understanding, contextual interpretation, and emotional interaction during the learning process. AI functions more effectively as a supporting instructional medium that enhances pronunciation practice, adaptive exercises, and autonomous learning opportunities. The study also reinforces constructivist learning theory, which emphasizes active and individualized learning experiences, as AI tools enable students to engage more interactively with Arabic language materials.

The ethical implications of AI in education also need careful consideration. While AI has the potential to enhance learning, it also raises concerns about data privacy and the potential for bias in AI systems. Cummings et al. (2021) argue that AI algorithms must be designed with fairness in mind to avoid reinforcing existing inequalities. In this study, students expressed concerns about how their data would be used, particularly in terms of privacy. These concerns must be addressed to ensure that AI is used responsibly in education.

CONCLUSION

The integration of Artificial Intelligence (AI) in Arabic language education within madrasahs Al Falah demonstrates substantial potential to improve learning effectiveness, student engagement, pronunciation accuracy, and personalized instructional practices. The findings confirm that AI-assisted learning tools can support adaptive learning environments and increase accessibility to Arabic language education, particularly in institutions with limited educational resources. At the same time, the study identifies several significant barriers, including insufficient teacher readiness, inadequate technological infrastructure, financial limitations, and ethical concerns related to data privacy and algorithmic bias. Theoretically, this study contributes to the growing discourse on AI-supported language education by highlighting the importance of integrating technological innovation with culturally relevant Islamic educational practices. Practically, the findings emphasize the need for professional development programs, institutional policy support, and infrastructure investment to ensure effective AI implementation in madrasahs Al Falah. Future empirical research is recommended to examine the long-

term effectiveness of specific AI applications in Arabic language learning, comparative implementation across different educational settings, and the ethical governance of AI-based educational systems.

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