

Implementing AI in Arabic Language Learning: Challenges and Insights from Islamic Higher Education

Rabiatul Adawiyah¹

¹ Universitas Islam Negeri Mataram, Indonesia; rabiatul_adawiyah@uinmataram.ac.id

ARTICLE INFO

Keywords:

artificial intelligence;
Arabic language learning;
Islamic higher education;
challenges;
lecturers' perspectives

Article history:

Received 2025-03-14

Revised 2025-04-18

Accepted 2025-07-16

ABSTRACT

Artificial Intelligence (AI) is increasingly influencing educational practices, including Arabic language instruction in Islamic higher education. Despite its potential, AI integration encounters technical, pedagogical, and cultural obstacles. This qualitative study employed a case study design at the State Islamic University of Mataram. Data were gathered through in-depth interviews with six Arabic language lecturers actively using AI in their teaching, classroom observations of AI-assisted learning, and document analysis. Thematic analysis was used to identify key patterns and challenges. Findings indicate that lecturers generally view AI positively, recognizing its potential to enhance instructional effectiveness and student understanding while still emphasizing the essential roles of teachers and learners. However, several barriers hinder full integration. These include 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. Although lecturers acknowledge the value of AI in Arabic language education, its practical application is constrained by infrastructural and human resource limitations. Addressing these issues is vital to realize the benefits of AI-enhanced learning environments. This study provides valuable insights into the challenges of AI implementation in Arabic language teaching. It highlights the need for strategic, inclusive approaches by educators, institutions, and developers to ensure effective and sustainable AI integration in Islamic higher education.

This is an open access article under the [CC BY-NC-SA](#) license.



Corresponding Author:

Rabiatul Adawiyah

Universitas Islam Negeri Mataram, Indonesia; rabiatul_adawiyah@uinmataram.ac.id

1. INTRODUCTION

The learning of Arabic holds significant value in the global era, not only as a tool for communication but also as a carrier of cultural, religious, and academic values. Arabic, spoken by over 422 million people, is the language of the Quran, which is recited by 1.9 billion Muslims (Alrumiah & Al-Shargabi, 2023). Furthermore, Arabic serves as a key to accessing the cultural and intellectual heritage of Islam, including literature, philosophy, and classical sciences (Mehmood et al., 2024). In an academic context, proficiency in Arabic opens doors to interdisciplinary research, encompassing

Middle Eastern studies and linguistics (Hamruni & Suwartini, 2022). Thus, the study of Arabic enriches individual knowledge and fosters intercultural dialogue.

The integration of AI in language learning is becoming increasingly popular, offering innovative solutions to enhance effectiveness and efficiency (Chang & Sun, 2024). For instance, automated translation tools such as Google Translate facilitate the comprehension of multilingual texts. AI-powered chatbots, like ChatGPT, provide instant feedback and enable conversational practice (Hamad et al., 2024; Ohashi, 2024). Adaptive learning systems also tailor content to individual needs (Chang & Sun, 2024). With these tools, AI not only simplifies access to learning materials but also creates personalised and interactive learning experiences.

AI holds significant potential in facilitating Arabic language learning through technologies such as speech recognition, text analysis, and personalised learning (Yang, 2025). Speech recognition assists learners in practising pronunciation and intonation with instant feedback. AI text analysis processes and translates Arabic texts accurately, aiding in the understanding of sentence structures and vocabulary (Haboussi et al., 2025; Hanandeh et al., 2024). Adaptive systems customise materials based on individual proficiency, improving learning effectiveness (Mustafa et al., 2024). By leveraging these capabilities, AI makes Arabic language learning more interactive, precise, and tailored to individual needs.

However, it is important to note that AI functions solely as a supplementary tool. AI is not a core component of the learning process capable of replacing the role of lecturers (Yang, 2025). Lecturers are responsible for designing learning strategies that effectively utilise AI and ensuring alignment with learning objectives (Alqahtani & Wafula, 2024). The development of lecturers' technological competencies through training is also crucial to optimise the potential of AI (Kohnke, 2024; Lee et al., 2024). With the active involvement of lecturers, the integration of AI can drive innovation and deliver sustainable positive impacts. Therefore, an analytical study of lecturers' perspectives and the challenges they face when implementing AI in Arabic language learning is essential.

We argue that a study examining lecturers' perspectives on AI in Arabic language learning and its practical implementation is of paramount importance. The aim is to identify technical, pedagogical, and cultural challenges. Technical challenges encompass infrastructure and system compatibility, while pedagogical aspects involve the alignment of AI methods with the curriculum. Resistance to change or a lack of understanding regarding the benefits of AI must also be addressed. By exploring these challenges, institutions can design comprehensive strategies for the effective integration of AI.

Previous studies indicate that AI in language education has advanced significantly. For instance, Mohideen (2024) explored AI's ability to address challenges in learning Arabic, such as complex grammar, through personalised tools. Almaaytah (2022) investigated the limitations of AI in translating idiomatic expressions, emphasising cultural sensitivity. Fahraini & Almaliki (2023) evaluated the *Tashkeel* application for Arabic vocalisation, noting its utility despite syntactic errors. Sidik et al. (2024) identified AI's potential to enhance language skills but highlighted challenges such as limited infrastructure and teacher training. Mustofa et al. (2024) discussed the benefits of ChatGPT in Arabic language learning, advocating for human oversight. Yatri et al. (2023) revealed AI's advantages in language education but cautioned against over-reliance and ethical concerns. However, the current study distinguishes itself from prior research by focusing on lecturers' perspectives and practical implementation challenges, as well as employing a case study methodology in a private higher education institution. Furthermore, this study provides a specific local context and an in-depth exploration of AI implementation challenges from the lecturers' viewpoint.

This study is guided by two research questions: 1) What are lecturers' perspectives on the use of AI in Arabic language learning in higher education? 2) What are the main challenges faced by lecturers in implementing AI for Arabic language learning? This research contributes to filling the literature gap on the integration of artificial intelligence (AI) in Arabic language learning in higher education, particularly through the analysis of lecturers' perspectives and implementation challenges. Additionally, the study offers practical recommendations for educational institutions, lecturers, and

technology developers to optimise the use of AI, fostering inclusive and adaptive educational innovation in the digital era.

2. METHODS

This study adopts a qualitative approach using a case study design to explore in depth the perspectives and challenges associated with implementing artificial intelligence (AI) in Arabic language learning at a state Islamic higher education institution. The case study method was chosen for its ability to provide rich, contextualized insights and facilitate holistic exploration of real-life educational settings. The research was conducted at the State Islamic University of Mataram, focusing specifically on Arabic language lecturers who integrate AI tools into their teaching.

Participants in this study comprised six Arabic language lecturers actively utilizing AI-based platforms such as ChatGPT, Google Translate, and similar applications in their instruction. These individuals were selected due to their direct experience and involvement with AI-enhanced language learning, offering valuable insights into both the benefits and obstacles they face. Data were collected through in-depth interviews, which allowed the researchers to capture detailed accounts of the lecturers' views, experiences, and challenges in adopting AI technologies.

In addition to interviews, the study employed direct observations of AI-integrated learning sessions to gain a better understanding of the context and application of these technologies in classroom settings. Documentation, including photographs of instructional activities, screenshots of AI tool usage, and relevant academic articles, further supplemented the data.

The collected data were analyzed thematically. This involved coding the interview transcripts, observation notes, and documents to identify recurring patterns and themes. To ensure the credibility and validity of the findings, source triangulation was employed by comparing data from interviews, observations, and documentation. Additionally, member checking was conducted to verify interpretations with participants, ensuring alignment between the researchers' analysis and the participants' actual experiences.

3. FINDINGS AND DISCUSSION

3.1. Lecturers' Understanding of AI

The findings of this study reveal significant insights into lecturers' perspectives on the integration of Artificial Intelligence (AI) in Arabic language learning in higher education. The analysis is divided into two main themes: (1) understanding of AI and (2) the role of AI in Arabic language learning.

a. Lecturers' Understanding of AI

Lecturers provided various definitions and interpretations of AI, reflecting a broad understanding of its capabilities and implications. Most informants viewed AI as a technological revolution that mimics human intelligence and aims to simplify human tasks. For example, Informant 1 defined AI as "technology that resembles human intelligence and is designed to make human tasks easier" (Informant 1, *Interview*, 2024). Additionally, some lecturers emphasised AI's ability to perform tasks requiring human-like intelligence, such as natural language processing and pattern recognition. These capabilities were deemed highly relevant in the context of educational applications, particularly in language learning.

b. Lecturers' Understanding of AI in the Context of Arabic Language Learning

Lecturers expressed a high level of optimism regarding the application of AI in Arabic language learning. They viewed AI as a potential tool to enhance the effectiveness of learning media. Informant 2 stated that "AI can support the needs of Arabic language learning media as a digital resource that facilitates access to learning references" (Informant 2, *Interview*, 2024). Furthermore, AI was considered capable of creating more engaging and effective learning methods and techniques. Informant 3 asserted that "AI in the context of Arabic language learning is highly beneficial in improving learning methods and techniques"

(Informant 3, *Interview*, 2024). This perspective underscores AI's potential to transform traditional teaching approaches and create a more dynamic and interactive learning environment.

Overall, the findings indicate that lecturers are aware of AI's transformative potential in higher education, particularly in Arabic language learning. Their optimism reflects a belief in AI's ability to enhance learning media, methods, and outcomes. However, these findings also suggest the need for further exploration of practical challenges and implementation strategies to optimise AI's potential in this context.

3.2. Implementation Challenges

Based on data analysis, this study identified several significant challenges in implementing Artificial Intelligence (AI) for Arabic language learning, including:

- a. **Inadequate Internet Quotas or Signals**
Lecturers highlighted that inadequate internet quotas or poor signal strength significantly hinder the optimal use of AI in the learning process. As stated by Informant 1, "internet quotas or signals are still insufficient" (Informant 1, *Interview*, 2024), this issue directly impedes students' ability to access essential AI-based learning resources, limiting their engagement with the course material. The consequences of this limitation are substantial, as it not only affects students' ability to participate in online learning activities but also reduces the effectiveness of AI-driven tools that are crucial for personalized learning and assessment. In response, institutions could explore potential solutions, such as providing additional internet quotas or improving network infrastructure on campus, to ensure that students can fully engage with AI technologies and benefit from their educational potential.
- b. **Student Readiness**
Student readiness has also been identified as a critical factor in the effective use of AI in language learning. Some students lack foundational knowledge in Arabic grammar, which hinders their ability to understand and critically assess AI-generated translations. As noted by Informant 2, "one of the biggest challenges in implementing AI for Arabic language learning is related to students' mental and skill readiness" (Informant 2, *Interview*, 2024). This lack of preparedness can significantly impact the effectiveness of AI tools, as students may struggle to fully comprehend the output or engage with the learning process in a meaningful way. To address this challenge, institutions might consider offering preparatory courses or workshops focused on building essential language skills and mental readiness, ensuring that students are better equipped to use AI tools effectively and gain the most from their educational experience.
- c. **Lecturers' Adaptation to AI Technology**
Lecturers' adaptation to AI also emerged as a significant challenge. Some lecturers expressed the need to improve their skills and mindset to keep up with technological advancements. As stressed by Informant 3, "The first challenge is ourselves. Are we adaptive enough to this technological development (AI) in learning?" (Informant 3, *Interview*, 2024). This reluctance or difficulty in adapting to new technologies can hinder the effective integration of AI into the learning process, affecting its potential impact on teaching and student engagement. To address this issue, institutions could offer professional development programs focused on enhancing lecturers' digital literacy and their ability to integrate AI effectively into their teaching strategies. Such initiatives would ensure that lecturers are better prepared to leverage AI tools, ultimately improving the quality and delivery of education.
- d. **Data Availability and AI System Customisation.**
Data availability and AI system customization were also identified as significant challenges. Lecturers highlighted that AI models require access to a sufficient amount of Arabic language data to function effectively. As noted by Informant 4, "ensuring AI models have access to

adequate Arabic language data for training and understanding the language well is a challenge" (Informant 4, *Interview*, 2024). This limitation is particularly critical as the availability of Arabic language data is far less compared to other languages, which presents a significant obstacle to the development and customization of AI systems tailored to Arabic language learning. The practical consequence of this issue is that AI models may struggle to produce accurate translations or personalized learning experiences for students. To address this, institutions could collaborate with data providers to expand access to Arabic language datasets or invest in data collection efforts to ensure AI models are trained with sufficient, high-quality data, enabling more effective use of AI in Arabic language education.

e. Technical Constraints

Technical constraints also emerged as a significant challenge when using AI applications. Not all AI-based applications support the Arabic language, which limits their effectiveness in language learning. As pointed out by Informant 6, "not all AI-based applications support Arabic, so we cannot utilise them to their full potential" (Informant 6, *Interview*, 2024). This limitation significantly reduces the ability of both lecturers and students to fully benefit from AI tools in the learning process. The consequence of this challenge is that students may not be able to access or engage with the most advanced AI resources, which could impact their language acquisition and proficiency. To address this issue, institutions could collaborate with AI developers to create or customize applications that are specifically designed to support the Arabic language, ensuring that these tools meet the unique needs of Arabic language learners and educators.

Overall, the challenges in implementing AI for Arabic language learning encompass technological readiness, student readiness, lecturers' adaptation, data availability, and technical constraints. Addressing these challenges requires collaboration among lecturers, students, and technology developers to create a more effective and efficient learning environment. These findings provide a basis for practical recommendations and further research in this field.

Discussion

This study provides valuable insights into lecturers' perceptions of AI integration in Arabic language learning in higher education. Two main themes emerged: lecturers' understanding of AI and the role AI plays in Arabic language education. Lecturers view AI not only as an advanced technology but as a transformative tool that can significantly enhance the learning process. This optimistic outlook is tempered, however, by several challenges that must be addressed to ensure effective implementation.

Lecturers recognize AI as a powerful technology that can simplify complex tasks, thereby enhancing the efficiency and quality of learning. AI is seen as a tool that mimics human intelligence, with applications in natural language processing and pattern recognition, making it highly relevant for language learning contexts (Huang, 2024). This awareness forms a crucial foundation for the effective application of AI in education, driving innovation in teaching methods. From the perspective of the Technology Acceptance Model (TAM), this understanding aligns with the perceived usefulness and ease of use of AI, which influences lecturers' willingness to adopt and integrate AI tools into their teaching practices.

Lecturers exhibit high levels of optimism about AI's role in Arabic language learning, viewing it as a tool capable of enhancing media effectiveness and creating engaging, dynamic teaching methods (Mustafa et al., 2024; Nguyen, 2025). AI is considered a valuable resource that can facilitate access to learning materials and develop interactive techniques (Ahmed, 2024; Hanandeh et al., 2024). This perspective reflects the SAMR model, where AI moves beyond substitution, transforming traditional teaching methods into more engaging, interactive experiences. However, despite the optimism, there are significant barriers to AI adoption. Challenges such as digital divides, technical limitations, and ethical concerns must be addressed to ensure AI is implemented effectively in the classroom (Ren & Wu, 2025). These barriers indicate that AI's integration in education requires more than just

technological adoption; it must also align with pedagogical goals that keep the learning process student-centered and preserve the role of lecturers as facilitators.

This study identifies five key challenges in the implementation of Artificial Intelligence (AI) for Arabic language learning in higher education: (1) technological and infrastructure readiness, (2) student readiness, (3) lecturers' adaptation to AI technology, (4) data availability and AI system customization, and (5) technical constraints in using AI-based applications. These challenges highlight the complexity of integrating AI into Arabic language education, which involves not only technical but also pedagogical and human resource factors. The following sections will examine each challenge and propose strategies for addressing it.

One of the primary challenges identified is technological and infrastructure readiness. Insufficient internet quotas and poor signal strength hinder students' ability to access AI resources. This is particularly evident in higher education, where inadequate digital infrastructure remains a significant barrier (Alotaibi, 2024; Alshemaimri et al., 2025). However, simply investing in infrastructure is not enough; it must be accompanied by user capacity-building efforts (Bamiah et al., 2018). As Meridha (2024) notes, robust infrastructure should be balanced with improved digital literacy. This research emphasizes that educational institutions must not only enhance technological infrastructure but also ensure that both lecturers and students are equipped with the skills needed to effectively use AI technology. This dual approach is critical for improving the effectiveness of Arabic language learning through AI.

Student readiness is another crucial factor in the success of AI implementation. Students who lack a foundational understanding of Arabic grammar struggle to evaluate AI-generated translations critically. Research by Ahmed (2024) and Hanandeh et al. (2024) confirms that students with lower language proficiency are less able to benefit from AI in language learning. AI tools require a basic level of language skills to be effective, as they rely on students' ability to engage with the technology meaningfully. Hanandeh et al. (2024) argue that AI can aid in Arabic language learning through tools like word processors for grammar and spelling corrections, or chatbots that assist with Arabic conversation. Thus, a phased approach is recommended when introducing AI, starting with basic Arabic language training and digital literacy to ensure students can effectively leverage AI tools to enhance their language skills.

Lecturers' adaptation to AI technology presents a significant challenge in its integration into education. Effective adoption of AI requires lecturers to enhance their adaptability through targeted training on AI applications. Resistance to AI among lecturers is often linked to insufficient training and lack of institutional support (Watermeyer et al., 2024). As Boateng (2025) emphasizes, AI technology will not achieve the desired outcomes without adequate training and institutional backing. A collaborative, ongoing training approach is crucial to improving lecturers' capacity to integrate AI into their teaching methods. According to S. Chen et al. (2025), involving lecturers in the development and implementation of AI technology can significantly enhance its successful adoption. Therefore, educational institutions must prioritize comprehensive training programs to support lecturers in effectively using AI to improve the quality of instruction.

Another challenge lies in the availability of data and the customization of AI systems, particularly for Arabic language learning. AI models require sufficient, high-quality language data to function effectively. A lack of comprehensive data for underrepresented languages like Arabic can lead to biases and inaccuracies in AI systems (Wei et al., 2025). Generative models, such as GPT-4, may exhibit social identity biases, which are amplified by the scarcity of data in specific languages (Hu et al., 2025). In the context of Arabic language learning, Ahmed (2024) argues that AI can enhance students' understanding of grammar through immediate feedback and personalized exercises. However, the limited availability of Arabic language data hampers the effectiveness of AI in providing accurate and culturally relevant learning experiences. To overcome this, collaborative efforts are needed to collect and process relevant Arabic data and develop AI models tailored to local contexts and linguistic nuances.

Technical constraints also limit the potential of AI applications in Arabic language learning. Many AI-powered applications do not support Arabic adequately, reducing their effectiveness. For instance, translation tools like Google Translate often produce inaccurate translations, particularly when dealing with idiomatic or culturally specific phrases. As highlighted by Ahmed (2024), AI has the potential to enhance students' understanding of Arabic grammar through immediate feedback and personalized exercises. However, a lack of technical support for text recognition, translation, and linguistic analysis can restrict the utility of AI-based tools and limit access to advanced features. Hanandeh et al. (2024) further emphasize that the lack of technical support for Arabic hampers AI's effectiveness as a learning aid. Therefore, it is essential to develop more inclusive AI applications, such as language learning platforms that tailor materials based on users' proficiency levels. Collaboration between technology developers and linguistic experts is necessary to ensure that AI applications genuinely support the goals of Arabic language education.

We argue that the challenges in implementing AI for Arabic language learning are interconnected and require a holistic approach. The success of AI in education depends not only on technology but also on user readiness, data availability, and institutional support. In the context of Arabic, challenges such as the lack of AI applications that support the unique characteristics of the language, limited datasets, and the readiness of lecturers and students to use technology act as significant barriers. Therefore, educational institutions need to adopt integrated strategies, including infrastructure improvements, training for lecturers and students, and the development of inclusive and adaptive AI applications tailored to the needs of Arabic language learning. Through these measures, AI can become a more effective tool for enhancing the quality of learning and addressing the linguistic complexities of Arabic.

Furthermore, these challenges also highlight the necessity for collaboration among various stakeholders, including lecturers, students, technology developers, and policymakers. A study by Opstoel et al. (2024) demonstrates that collaboration through "co-creation" strategies can create a more inclusive and effective learning ecosystem. Such collaboration also supports the development of 21st-century skills, such as critical and creative thinking (Marmoah et al., 2022). Support from research by H. Chen et al. (2024) further underscores that collaboration among stakeholders is key to fostering sustainable educational innovation. Thus, the implementation of AI in Arabic language learning can be carried out more sustainably, delivering significant benefits to all educational stakeholders.

By considering these challenges, educational institutions can take strategic steps to ensure that the integration of AI in Arabic language learning not only enhances efficiency but also maintains a humanistic, student-centred learning quality. Recent studies provide valuable insights into how these challenges can be addressed; however, it is important to recognise that each educational context has unique characteristics that require tailored approaches.

The findings of this study provide a clear picture of how lecturers perceive the integration of Artificial Intelligence (AI) in Arabic language learning in higher education. Two main themes emerged: lecturers' understanding of AI and the role of AI in Arabic language learning. These themes indicate that lecturers not only view AI as an advanced technology but also see it as a tool capable of bringing significant changes to the learning process. However, beyond this optimism, several challenges need to be addressed to ensure the effective implementation of AI. The implications of these findings can be examined from three main perspectives: pedagogical implications, technical implications, and policy implications.

From a pedagogical perspective, these findings underscore the need for more innovative and adaptive learning approaches. Lecturers need to integrate AI as a supplementary tool that can enrich teaching methods, such as using AI-based applications for speaking, writing, or Arabic text comprehension exercises. However, it is crucial to ensure that the use of AI does not diminish the human interaction between lecturers and students. As highlighted by Technology should be used to enhance, not replace, the role of educators. Therefore, lecturers must be equipped with adequate

training to optimise the use of AI in pedagogical contexts while maintaining a focus on student-centred learning.

From a technical perspective, these findings emphasise the importance of developing infrastructure and applications that support Arabic language learning. The availability of sufficient Arabic language data, as stressed by Sallam et al. (2024), is key to developing accurate and relevant AI systems. Additionally, collaboration between technology developers and Arabic language experts is necessary to create applications tailored to local needs. For instance, developing applications that support Arabic dialects or specific features for Arabic grammar learning. These technical implications also include the need for improvements in digital infrastructure, such as stable and affordable internet access, to ensure that students and lecturers can optimally access AI resources.

Finally, from a policy perspective, these findings call for a commitment from educational institutions and governments to support the integration of AI in Arabic language learning. Policies that support lecturer training, AI-based curriculum development, and budget allocation for technological infrastructure need to be strengthened. A study by Hashim et al. (2022) emphasises that the success of technology-driven educational transformation requires holistic and sustainable policy support. Furthermore, policies regulating the ethical use of AI, such as student data protection and transparency in AI algorithms, must be established. This ensures that AI implementation is conducted responsibly and sustainably.

Overall, the implications of these findings affirm that the integration of AI in Arabic language learning holds significant potential to enhance educational quality. However, this potential can only be realised through an integrated approach encompassing pedagogical, technical, and policy aspects. By considering these implications, educational institutions can take strategic steps to ensure that AI becomes an effective tool in transforming Arabic language learning while preserving the humanistic values of education.

4. CONCLUSION

This study demonstrates that the integration of AI in Arabic language learning in higher education holds significant transformative potential, particularly in enhancing material personalization and learning efficiency. However, its successful implementation is hindered by challenges such as infrastructure readiness, the adaptation of lecturers and students, the availability of Arabic language data, and technical constraints in AI applications. To overcome these issues, a holistic approach is necessary, encompassing infrastructure improvements, targeted training programs, the development of inclusive AI applications, and fostering collaboration between technology developers, linguistic experts, and educational institutions. By focusing on these areas, AI can become a powerful tool for improving the quality of Arabic language learning, while ensuring that student needs and the humanistic values of education are prioritized.

This study contributes to the literature by being one of the first to explore the challenges of AI integration in Arabic language learning within the context of Islamic higher education, particularly in Mataram City. The findings highlight the critical barriers and opportunities for AI adoption in this field, providing valuable insights for educators, policymakers, and researchers. Moving forward, it is essential to implement specific recommendations to enhance AI adoption. Islamic universities should invest in AI tools such as language processing applications and intelligent tutoring systems that offer personalized learning experiences. Training programs for lecturers should focus on AI literacy and pedagogical strategies for incorporating AI into teaching, using tools like GPT-based language models or AI-powered grammar checkers. Additionally, universities should develop policies that support the integration of AI, including providing adequate infrastructure and ensuring continuous professional development for faculty members.

However, several limitations of this study must be acknowledged. First, the research was conducted at a single state Islamic university in Mataram City, which may limit the generalizability of the findings to other institutions with different characteristics. Second, the use of a case study approach,

while offering in-depth analysis, restricts the ability to simplify the results. Additionally, this study focused solely on lecturers, leaving out perspectives from students and other key stakeholders. Lastly, due to the qualitative nature of this research, broader statistical analyses were not conducted. Therefore, future research should expand the scope, include a more diverse range of participants, and employ mixed-methods approaches to provide more comprehensive insights and actionable recommendations.

REFERENCES

- Ahmed, A. A. (2024). The Impact of Artificial Intelligence on Teaching Arabic Grammar: An Analytical Study. *International Conference on Intelligent Systems, Blockchain, and Communication Technologies*, 185–194.
- Almaaytah, S. A. (2022). Translation of Idiomatic Expressions from Arabic into English using AI (Artificial Intelligence). *Journal of Positive School Psychology*, 6(4), 8839–8846.
- Alotaibi, N. S. (2024). The Impact of AI and LMS Integration on the Future of Higher Education: Opportunities, Challenges, and Strategies for Transformation. *Sustainability*, 16(23), 10357.
- Alqahtani, N., & Wafula, Z. (2024). Artificial Intelligence Integration: Pedagogical Strategies and Policies at Leading Universities. *Innovative Higher Education*, 1–20. <https://doi.org/https://doi.org/10.1007/s10755-024-09749-x>
- Alrumiah, S. S., & Al-Shargabi, A. A. (2023). A Deep Diacritics-Based Recognition Model for Arabic Speech: Quranic Verses as Case Study. *IEEE Access*, 11, 81348–81360. <https://doi.org/10.1109/ACCESS.2023.3300972>
- Alshemaimri, B., Badshah, A., Daud, A., Bukhari, A., Alsini, R., & Alghushairy, O. (2025). Regional Computing Approach for Educational Big Data. *Scientific Reports*, 15(1), 7619.
- Bamiah, S. N., Brohi, S. N., & Rad, B. B. (2018). Big Data Technology in Education: Advantages, Implementations, and Challenges. *Journal of Engineering Science and Technology*, 13(Special Issue on ICCSIT 2018), 229–241.
- Boateng, O. (2025). *Can AI Close the Learning Gap? The Role of Adaptive Learning Technologies*. University of Oxford. <https://aieou.web.ox.ac.uk/article/can-ai-close-learning-gap-role-adaptive-learning-technologies>
- Chang, W.-L., & Sun, J. C.-Y. (2024). Evaluating AI's Impact on Self-Regulated Language Learning: A systematic Review. *System*, 126, 103484. <https://doi.org/https://doi.org/10.1016/j.system.2024.103484>
- Chen, H., Fu, G., Wu, H., Xiao, Y., Nie, X., & Zhao, W. (2024). Sustainable Collaboration and Incentive Policies for the Integration of Professional Education and Innovation and Entrepreneurship Education (IPEIEE). *Sustainability*, 16(17), 7558.
- Chen, L., Chen, P., & Lin, Z. (2020). Artificial Intelligence in Education: A Review. *IEEE Access*, 8, 75264–75278. <https://doi.org/10.1109/ACCESS.2020.2988510>
- Chen, S., Metoyer, R., Le, K., Acunin, A., Molnar, I., Ambrose, L., Lang, J., Chawla, N., & Metoyer, R. (2025). Bridging the AI Adoption Gap: Designing an Interactive Pedagogical Agent for Higher Education Instructors. *Human-Computer Interaction*, 1–20. <https://arxiv.org/abs/2503.05039>
- Fahraini, S., & Almaliki, M. F. (2023). Analysis of Arabic against The Use of Artificial Intelligence (AI) through Tashkeel (Automatic Harokat) Application to Increase Maharah Qiraah. *Proceeding International Conference on Education*, 64–77.
- Fu, Y., Weng, Z., & Wang, J. (2024). Examining AI Use in Educational Contexts: A Scoping Meta-Review and Bibliometric Analysis. In *International Journal of Artificial Intelligence in Education*. <https://doi.org/10.1007/s40593-024-00442-w>
- Gökçearsan, S., Tosun, C., & Erdemir, Z. G. (2024). Benefits, Challenges, and Methods of Artificial Intelligence (AI) Chatbots In Education: A Systematic Literature Review. *International Journal of Technology in Education*, 7(1), 19–39.
- Haboussi, S., Oukas, N., Zerrouki, T., & Djettou, H. (2025). Arabic Speech Recognition Using Neural Networks: Concepts, Literature Review and Challenges. *Journal of Umm Al-Qura University for*

- Applied Sciences*, 1–23. <https://doi.org/10.1007/s43994-025-00213-w>
- Hamad, Z. T., Laouar, M. R., & Diallo Yaccoub, M. H. (2024). A Comparative Analysis of ChatGPT and AI-Powered Research Tools for Scientific Writing and Research. In Y. M. Elhadj, M. F. Nanne, A. Koubaa, F. Meziane, & M. Deriche (Ed.), *Artificial Intelligence and Its Practical Applications in the Digital Economy* (hal. 251–268). Springer Nature Switzerland.
- Hamruni, & Suwartini, S. (2022). Artificial Intelligence in Global Islamic Education. *IOSR Journal Of Humanities And Social Science*, 27(6), 39–49. <https://doi.org/10.9790/0837-2706033949>
- Hanandeh, A., Ayasrah, S., Kofahi, I., & Qudah, S. (2024). Artificial Intelligence in Arabic Linguistic Landscape: Opportunities, Challenges, and Future Directions. *TEM Journal*, 13(4), 3137–3145.
- Hu, T., Kyrchenko, Y., Rathje, S., Collier, N., van der Linden, S., & Roozenbeek, J. (2025). Generative Language Models Exhibit Social Identity Biases. *Nature Computational Science*, 5(1), 65–75. <https://doi.org/10.1038/s43588-024-00741-1>
- Huang, F. (2024). Language Acquisition Pattern Recognition and Personalized Teaching Strategies Based on Artificial Intelligence. *International Conference on Financial Management, Humanities and Social Sciences (ICFMHSS 2024) Language, Icfmhss*, 409–414. <https://doi.org/10.25236/icfmhss.2024.067>
- Kohnke, L. (2024). Enhancing Teacher Professional Development with AI. In *Optimizing Digital Competence through Microlearning: Flexible Approaches to Teacher Professional Development* (hal. 55–66). Springer. https://doi.org/https://doi.org/10.1007/978-981-97-8839-2_6
- Lee, Y.-J., Davis, R. O., & Ryu, J. (2024). Korean in-service Teachers' Perceptions of Implementing Artificial Intelligence (AI) Education for Teaching in Schools and Their AI Teacher Training Programs. *International Journal of Information and Education Technology*, 14(2), 214–219. <https://doi.org/10.18178/ijiet.2024.14.2.2042>
- Marmoah, S., Gestardi, R., Sarwanto, S., Chumdari, C., & Maryani, I. (2022). A Bibliometric Analysis of Collaboration Skills in Education (2019-2021). *Journal of Education and Learning (EduLearn)*, 16(4), 542–551.
- Mehmood, M., Keerio, I. K., & Husnain, M. (2024). Artificial Intelligence in Islamic Studies: Exploring Opportunities and Addressing Challenges. *Al-Salihat (Journal of Women, Society, and Religion)*, 3(02), 9–16.
- Meridha, J. M. (2024). The Causes of Poor Digital Literacy in Educational Practice, and Possible Solutions among The Stakeholders: A Systematic Literature Review. *SN Social Sciences*, 4(11), 210.
- Mohamed Hashim, M. A., Tlemsani, I., & Duncan Matthews, R. (2022). A Sustainable University: Digital Transformation and Beyond. *Education and Information Technologies*, 27(7), 8961–8996.
- Mohideen, H. L. M. (2024). Exploring the Opportunities of Implementing Artificial Intelligence (AI) Technology for Teaching Arabic to Non-Native Speakers: A Theoretical Approach. *Journal of Digital Learning and Distance Education*, 2(9), 760–767.
- Mustafa, M. Y., Tlili, A., Lampropoulos, G., Huang, R., Jandrić, P., Zhao, J., Salha, S., Xu, L., Panda, S., Kinshuk, López-Pernas, S., & Saqr, M. (2024). A Systematic Review of Literature Reviews on Artificial Intelligence in Education (AIED): A Roadmap to A Future Research Agenda. *Smart Learning Environments*, 11(1), 59. <https://doi.org/10.1186/s40561-024-00350-5>
- Mustofa, A., PS, S. S. D., Sari, S. R., & Wirawan, R. (2024). Use of AI Artificial Intelligence ChatGPT for Arabic Language Learning Media. *At Turots: Jurnal Pendidikan Islam*, 6(1), 236–249.
- Nguyen, K. V. (2025). The Use of Generative AI Tools in Higher Education: Ethical and Pedagogical Principles. *Journal of Academic Ethics*, 14, 1–21. <https://doi.org/10.1007/s10805-025-09607-1>
- Ohashi, L. (2024). AI in Language Education: The Impact of Machine Translation and ChatGPT. In P. Ilic, I. Casebourne, & R. Wegerif (Ed.), *Artificial Intelligence in Education: The Intersection of Technology and Pedagogy* (hal. 289–311). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-71232-6_13
- Opstoel, K., Buijs, E., van der Steen, J., Schenke, W., Admiraal, W., & Oolbekkink-Marchand, H. (2024). Interaction between Educational Research and Practice: Collaboration, Strategies and Conditions.

- International Journal of Educational Research Open*, 7, 100355. <https://doi.org/https://doi.org/10.1016/j.ijedro.2024.100355>
- Qian, L., Cao, W., & Chen, L. (2025). Influence of Artificial Intelligence on Higher Education Reform and Talent Cultivation in The Digital Intelligence Era. *Scientific Reports*, 15(1), 6047. <https://doi.org/10.1038/s41598-025-89392-4>
- Ren, X., & Wu, M. L. (2025). Examining Teaching Competencies and Challenges While Integrating Artificial Intelligence in Higher Education. *TechTrends*, 17, 1–20. <https://doi.org/10.1007/s11528-025-01055-3>
- Sallam, M., Al-Mahzoum, K., Alshuaib, O., Alhajri, H., Alotaibi, F., Alkhurainej, D., Al-Balwah, M. Y., Barakat, M., & Egger, J. (2024). Language Discrepancies in The Performance of Generative Artificial Intelligence Models: An Examination of Infectious Disease Queries in English and Arabic. *BMC Infectious Diseases*, 24(1), 799. <https://doi.org/10.1186/s12879-024-09725-y>
- Sidik, A., Hasibuan, A. H., Irawati, I., & Wahyuni, A. (2024). Integration of Artificial Intelligence (AI) Technology in Arabic Language Learning; Opportunities and Challenges. *International Conference on Islamic Education and Islamic Business (ICoBEI)*, 1(1), 83–92.
- Watermeyer, R., Lanclos, D., Phipps, L., Shapiro, H., Guizzo, D., & Knight, C. (2024). Academics' Weak (ening) Resistance to Generative AI: The Cause and Cost of Prestige? *Postdigital Science and Education*, 1–21.
- Wei, X., Kumar, N., & Zhang, H. (2025). Addressing Bias in Generative AI: Challenges and Research Opportunities in Information Management. *Information & Management*, 62(2), 104103. <https://doi.org/https://doi.org/10.1016/j.im.2025.104103>
- Yang, M. (2025). Artificial Intelligence Versus Human Teacher Assistants and Language Learners' Progress in Learning and Retention of Complex Sentences. *Current Psychology*, 25, 1–13. <https://doi.org/10.1007/s12144-025-07488-6>
- Yatri, D., Anugerahwati, M., & Setyowati, L. (2023). Artificial Intelligence (AI) in Language Learning (English and Arabic Class): Students' and Teachers' Experience And Perceptions. *Transformational Language Literature and Technology Overview in Learning (Transtool)*, 3(1), 1–12.