



Integrating Artificial Intelligence in Arabic Writing Proficiency: A Case Study in Islamic Boarding Schools

Masnun

Universitas Islam Internasional Darullughah Wadda'wah, Indonesia,
Email. Masnun@uiidalwa.ac.id

Abstract

The integration of Artificial Intelligence (AI) in Arabic language education has opened new opportunities for enhancing students' writing proficiency, particularly in Islamic boarding schools (pesantren). This study explores the impact of AI-assisted writing tools on Arabic writing (maharah kitābah) among 30 Aliyah-level students at Pondok Pesantren Darullughah Wadda'wah in Indonesia. Using a qualitative case study approach, the research examines how AI influences students' grammatical accuracy, fluency, and engagement in writing activities. Data were collected through semi-structured interviews, classroom observations, and comparative analysis of students' writing samples before and after AI intervention. Findings reveal that 75% of students improved their grammatical accuracy, particularly in verb conjugation and sentence structure, while 30% showed enhanced writing fluency, incorporating AI-suggested vocabulary and transitions. Students generally perceived AI as a valuable tool that provided instant feedback, reducing writing anxiety and fostering confidence. However, challenges emerged, including over-reliance on AI, limited technological accessibility, and the need for Arabic-specific AI writing tools. This study contributes to the growing field of AI-assisted Arabic education, offering insights into its practical applications and pedagogical implications. It underscores the importance of balanced AI integration, teacher training in AI pedagogy, and the development of more sophisticated Arabic AI tools to enhance the learning experience in traditional Islamic educational settings.

Keywords: Artificial Intelligence, Arabic Writing Proficiency, Maharah Kitabah, Islamic Boarding Schools, AI-Assisted Language Learning, Pedagogical Innovation,

Introduction

The integration of Artificial Intelligence (AI) in language education has seen rapid advancements in recent years, reshaping traditional teaching methodologies and enhancing student learning experiences. AI-driven tools such as automated writing assessment systems, machine translation, and intelligent tutoring systems have proven effective in improving writing proficiency in various languages. However, the adoption

of AI in Arabic language education, particularly in Islamic boarding schools (pesantren), remains relatively underexplored. Arabic writing (maharah kitābah) poses unique challenges due to its complex orthographic and morphological structures, making it crucial to investigate the role AI can play in supporting students' writing skills.

Despite the potential benefits of AI in language education, Islamic boarding schools face specific challenges in its implementation. These institutions often adhere to traditional teaching methods, prioritizing classical texts and conventional approaches to Arabic writing instruction. The lack of exposure to AI-driven tools and digital learning strategies contributes to a gap in pedagogical innovation. Therefore, understanding how AI can be effectively integrated into Arabic writing instruction in this context is essential.

This study focuses on the implementation of AI-assisted writing tools in Islamic boarding schools and their impact on students' Arabic writing proficiency. Specifically, it seeks to address the following research questions: How do AI-based writing tools enhance students' Arabic writing proficiency in Islamic boarding schools? What are the challenges and opportunities in integrating AI into Arabic writing instruction in traditional educational settings? How does AI influence students' engagement, accuracy, and fluency in Arabic writing?

The study is limited to selected Islamic boarding schools that have begun exploring AI applications in their curriculum. While the research primarily investigates students' performance, it also considers teachers' perspectives on the effectiveness and feasibility of AI integration.

Several studies have examined the role of AI in language learning, highlighting its impact on writing proficiency, automated feedback, and personalized learning pathways (Shahbari-Kassem et al., 2024; Yang et al., 2021). Research has also shown that AI can improve writing accuracy, reduce cognitive load, and enhance student motivation (Zhai et al., 2021). However, existing studies predominantly focus on English and other widely spoken languages, with limited attention to Arabic writing instruction (Khoiroh, 2023), especially in traditional Islamic educational contexts. Previous studies have explored AI's role in language learning, translation, and academic writing. Farghal & Haider (2024) compared human and AI translations of Classical Arabic poetry, finding that ChatGPT performed well, while Google Gemini struggled with prosody. Omar & Salih (2024) reviewed English/Arabic machine translation postediting, highlighting a lack of focus on translator skill development. Al-Sofi (2024) investigated ChatGPT's effectiveness in academic writing, noting student

satisfaction but concerns over plagiarism and overreliance (Al-Sofi, 2024; Farghal & Haider, 2024; Omar & Salih, 2024).

In the broader educational context, Keshav et al. (2022) emphasized the importance of technology in modernizing Arabic education, while Mudawy (2024) found that EFL faculty members viewed AI positively in research writing but required more training. Aliabadi et al. (2023) advocated for a transdisciplinary AI education model, integrating AI across subjects rather than treating it as an isolated field. Collectively, these studies underscore AI's growing role in education and language learning, while also identifying gaps in pedagogical integration, ethical concerns, and training needs (Aliabadi et al., 2023; Keshav et al., 2022; Mudawy, 2024).

While existing studies have explored AI's role in translation, academic writing, and education, research on its direct impact on Arabic writing proficiency within Islamic boarding schools remains limited. Most studies have focused on AI-assisted translation, general academic writing improvements, or technology integration in broader educational settings, yet few have specifically addressed how AI tools enhance Arabic syntax, morphology, and composition skills among students in traditional learning environments. Additionally, while AI is recognized for improving efficiency and reducing errors, concerns remain regarding overreliance, ethical implications, and the need for Arabic-specific AI tools. There is also a lack of research on teacher and student adaptation to AI in Arabic writing instruction, particularly in institutions that emphasize classical language learning and traditional pedagogical methods. This study aims to fill these gaps by investigating how AI-assisted writing tools influence Arabic writing proficiency in an Islamic boarding school context, addressing both its benefits and challenges in a structured educational setting.

Moreover, studies on Arabic language pedagogy have emphasized the challenges of writing proficiency, including syntactical complexity, spelling errors, and limited access to digital tools. Despite the growing interest in AI applications in education, there remains a gap in empirical research on how AI can specifically address these challenges in Arabic writing within Islamic boarding schools. This study aims to bridge this gap by exploring the pedagogical, technological, and institutional dimensions of AI adoption in Arabic writing instruction.

This research contributes to the field of Arabic language education by providing insights into the practical application of AI-driven writing tools in Islamic boarding schools. The findings will be valuable for educators, policymakers, and curriculum developers seeking to modernize Arabic language instruction while maintaining the core values of Islamic education. By identifying effective strategies for AI integration,

this study aims to enhance students' Arabic writing proficiency and foster a balanced approach between technological innovation and traditional learning methodologies.

Method

This study employs a qualitative case study approach to investigate the integration of Artificial Intelligence (AI) in enhancing Arabic writing proficiency (maharah kitābah) among students in an Islamic boarding school setting (Creswell & Creswell, 2020). The research is conducted at Pondok Pesantren Darullughah Wadda'wah, a well-known Islamic boarding school with a strong focus on Arabic language education. The study focuses on 30 Aliyah-level students (senior high school level) with an average age of 17–18 years, who have been learning Arabic writing as part of their formal curriculum.

This research is grounded in constructivist learning theory, which emphasizes the role of students in actively constructing knowledge through interaction with new learning tools, in this case, AI-assisted writing platforms. Additionally, sociocultural theory (Vygotsky, 1978) is used to analyze how AI tools serve as a mediational artifact in Arabic writing development, providing scaffolding and interactive feedback that enhance students' writing proficiency.

This study follows a qualitative case study design, incorporating both primary and secondary data sources: Primary data: Collected through semi-structured interviews, classroom observations, and students' writing samples before and after AI tool intervention. Secondary data: Includes AI-generated feedback reports, previous research on AI in language learning, and institutional records on Arabic writing instruction at the boarding school. The research utilizes purposive sampling to select students who have been introduced to AI-assisted writing tools. Teachers and administrators involved in the implementation of AI technology are also interviewed to provide a broader perspective on the challenges and opportunities of AI integration in Arabic writing instruction.

The data collection process is conducted in three phases: Pre-implementation Phase: A baseline assessment is conducted to evaluate students' Arabic writing skills before AI intervention. This involves analyzing students' essays and identifying common linguistic challenges such as grammatical errors, coherence issues, and lexical deficiencies. Implementation Phase: Students are introduced to AI-assisted Arabic writing tools (e.g., AI-powered grammar checkers, automated essay evaluators, and interactive writing assistants). Classroom sessions involve guided exercises where students engage with AI feedback and refine their writing. Post-implementation Phase:

After a set period of AI tool usage, students' writing samples are reassessed to measure improvements in accuracy, coherence, and overall writing fluency. Additionally, interviews and surveys are conducted to gauge students' perceptions of AI in enhancing their writing skills.

The collected data is analyzed using thematic analysis, categorizing key themes related to AI's effectiveness, students' engagement, and challenges in AI adoption. The students' writing samples are assessed through comparative textual analysis, identifying improvements in writing accuracy and fluency. Additionally, qualitative coding is used to analyze interview transcripts and classroom observations (Guimarães & Lima, 2021), allowing for a comprehensive understanding of students' experiences and learning outcomes. By employing this methodological approach, the study aims to provide a nuanced understanding of how AI integration can enhance Arabic writing proficiency in an Islamic boarding school context, highlighting its pedagogical implications and potential for broader educational reforms.

Result and Discussion

Pondok Pesantren Darullughah Wadda'wah (Dalwa) is one of Indonesia's leading Islamic boarding schools (pesantren) specializing in Arabic language education. With a full Arabic immersion curriculum, Dalwa places strong emphasis on nahwu (syntax), ḥarf (morphology), and practical language skills, particularly maharah kitābah (writing proficiency) (Baharun & Hanifansyah, 2024; Solehudin & Nur Hanifansyah, 2024). The traditional teaching methodology primarily relies on classical Arabic texts (kitab kuning), where writing skills are honed through insya' (composition), text analysis, and structured drills.

However, as educational technology, particularly Artificial Intelligence (AI), continues to evolve, pesantren like Dalwa face the challenge of integrating modern learning tools while preserving their long-standing pedagogical traditions. The limited exposure to AI-assisted learning in Arabic writing instruction presents a gap that needs further exploration. This study aims to investigate the impact of AI-powered writing tools on the writing proficiency of Dalwa's students, examining how AI can enhance grammatical accuracy, fluency, and overall writing competence, while ensuring that the core values of pesantren-based Arabic education remain intact (Nur Hanifansyah et al., 2024).

The Impact of AI-Based Writing Tools on Arabic Writing Proficiency

The introduction of AI-assisted writing tools at Pondok Pesantren Darullughah Wadda'wah has led to a notable improvement in students' Arabic writing proficiency. A comparative analysis of students' pre-test and post-test writing samples showed that 75% of students improved their grammatical accuracy, particularly in verb conjugation, sentence structure, and orthographic consistency. The AI feedback system provided instant corrective suggestions, helping students recognize and fix their mistakes faster than with traditional peer or teacher feedback.

Additionally, writing fluency—measured by coherence and lexical richness—increased by 30%, as students began incorporating AI-suggested vocabulary and transition phrases into their essays. Many students expressed how AI made the writing process smoother and less intimidating. One student shared:

"Before using AI, I often felt stuck, unsure which words to choose or how to structure my sentences. Now, I get instant feedback, and it helps me see what needs fixing right away."

However, while AI provided valuable support, some students initially struggled to interpret AI feedback in Arabic, as most AI-assisted writing tools are primarily designed for English and other widely spoken languages. This highlights the need for more Arabic-specific AI tools that cater to its unique linguistic structure.

Challenges in Implementing AI in Traditional Islamic Boarding Schools

Despite its advantages, integrating AI into Arabic writing instruction in Islamic boarding schools presents several pedagogical and infrastructural challenges. Teachers had mixed opinions on AI's role in the classroom. Some appreciated its efficiency, while others worried that it might lead to over-reliance on technology, preventing students from developing independent language intuition. One teacher voiced this concern:

"AI is a great tool, but I fear some students may start relying on it too much. Learning a language requires deep understanding, and AI alone can't replace the thought process needed to master Arabic writing."

Another major challenge was technological access. Many pesantren struggle with limited internet connectivity and a lack of digital resources, making AI-based learning unevenly accessible among students. Additionally, some AI tools lacked accuracy in Arabic morphological analysis, which is crucial for understanding classical Arabic texts, a fundamental aspect of pesantren education.

Student Engagement and Perceptions of AI in Writing Instruction

To assess student engagement and perception, we conducted semi-structured interviews and surveys. The results showed that 80% of students found AI feedback helpful, especially in detecting errors and improving vocabulary. However, 60% of students also expressed concerns about the lack of personalized teacher feedback, which they believe is essential for truly mastering Arabic grammar and writing. Some students found AI motivating and encouraging, as it allowed them to write with greater confidence. One student enthusiastically shared:

"I used to hesitate a lot when writing in Arabic because I was afraid of making mistakes. With AI, I can see what I need to fix instantly, and it gives me more confidence to write."

However, not all students embraced AI equally. Younger students (17 years old) were generally more receptive, whereas older students (18 years old) were more skeptical and preferred traditional teacher-led instruction. One senior student reflected: *"AI is useful, but I still prefer my teacher's corrections. AI tells me what's wrong, but my teacher explains why it's wrong, and that's what really helps me improve."*

The findings of this study align with previous research on AI-assisted language learning. Yang et al. (2021) found that AI tools help students enhance their writing accuracy and confidence, which was also observed in this study. Similarly, Shahbari-Kassem et al. (2022) highlighted how AI-driven writing tools can reduce students' anxiety about writing, a benefit echoed by many students in our research.

However, the concerns about over-reliance on AI are consistent with the warnings by Zhai et al. (2023), who argue that AI, while useful, should not replace critical thinking and linguistic intuition. The balance between AI automation and human instruction remains a key issue that requires further exploration.

Our study also highlights a notable research gap: while AI has been widely studied in English and Chinese language education, its application in Arabic writing instruction within Islamic boarding schools remains underexplored. Unlike mainstream AI writing tools optimized for Western languages, Arabic's complex morphology and syntax require greater adaptation and customization.

Implications for Arabic Language Education in Islamic Boarding Schools

Balanced Integration of AI – AI should complement, not replace, traditional Arabic writing instruction. A hybrid approach, where AI provides technical feedback and teachers focus on deeper linguistic and rhetorical aspects, may be the most effective model.

Developing AI for Arabic-Specific Needs – There is an urgent need for AI tools tailored for Arabic, particularly those capable of handling morphological complexity and contextual semantics.

Teacher Training on AI Pedagogy – Educators need training on how to effectively incorporate AI into Arabic writing instruction, ensuring it enhances learning rather than becoming a crutch.

Improving Technological Accessibility – Efforts should be made to enhance digital infrastructure in Islamic boarding schools, ensuring that AI resources are equitably available to all students.

AI-Assisted Writing, Mnemonics, and the Role of Morphology in Arabic Proficiency

The findings of this study reveal that Arabic writing proficiency is more reliant on morphological accuracy (ṣarf) than syntactic structure (nahwu). While students initially focused on sentence structure and word order, AI-assisted feedback emphasized the importance of correctly forming words based on their roots and patterns. Unlike spoken Arabic, where grammatical errors can still allow for comprehension, written Arabic demands precise morphological formations to maintain clarity and meaning (Mahmudah & Hanifansyah, 2024).

This observation aligns with the cognitive demands of Arabic composition, where mastering verb conjugations, noun derivations, and plural formations is essential. AI tools functioned as mnemonic aids, reinforcing patterns that students traditionally memorized through rote learning. By providing immediate corrective feedback, AI helped students internalize recurring patterns rather than merely memorizing isolated forms (Hanifansyah & Mahmudah, 2024).

A key advantage of AI-driven mnemonics was its ability to enhance pattern recognition in real-time. Many students reported that they recalled verb forms and word structures more easily after repeated AI corrections, supporting the idea that consistent exposure to structured feedback aids long-term retention. This suggests that AI can serve as a dynamic reinforcement tool, complementing traditional ṣarf instruction rather than replacing it (Mahmudah et al., 2024).

Despite these benefits, the reliance on AI for morphological accuracy presents potential drawbacks. Some students became dependent on AI-generated corrections instead of applying learned rules independently. Additionally, existing AI tools still struggle with some Arabic-specific morphological nuances, highlighting the need for further adaptation of AI systems for Arabic writing instruction.

These findings underscore the importance of developing AI tools specifically tailored for Arabic morphology, integrating mnemonic strategies that align with the way students naturally acquire linguistic structures. By balancing AI assistance with traditional *ṣarf* training, Arabic writing instruction can become more intuitive, effective, and adaptive to modern learning needs.

Conclusion

This study has examined the integration of AI-assisted writing tools in improving Arabic writing proficiency (*maharah kitābah*) among Aliyah-level students at Pondok Pesantren Darullughah Wadda'wah. The findings indicate that AI significantly enhances grammatical accuracy and writing fluency, with 75% of students demonstrating improved sentence structure and 30% showing greater coherence and lexical diversity in their writing. Students generally perceive AI as a valuable learning aid, as it provides real-time feedback, reduces writing anxiety, and increases confidence. However, challenges remain, particularly in terms of over-reliance on AI-generated corrections, limited technological access, and the absence of AI tools specifically designed for Arabic morphology and syntax.

Despite these challenges, this study underscores the pedagogical potential of AI in Islamic boarding schools, suggesting that a hybrid approach—where AI supports technical feedback while teachers provide deeper linguistic guidance—could optimize learning outcomes. Future research should explore AI adaptations tailored to Arabic linguistic complexities and investigate long-term effects of AI-assisted writing on students' independent language development. Additionally, further investment in teacher training and digital infrastructure is essential to ensure that AI-driven innovations are effectively integrated into Arabic language education without compromising traditional pedagogical values.

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