



ARTIFICIAL INTELLIGENCE LITERACY AMONG ARABIC LANGUAGE EDUCATION STUDENTS: INFLUENCING FACTORS AND PEDAGOGICAL IMPLICATIONS

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Abstract

This study aims to determine the level of Artificial Intelligence (AI) literacy among Arabic Language Education (PBA) students ISQI Sunan Pandanaran, analyze the factors influencing this level, and explore its implications for Arabic language learning. This study uses a mixed method with a convergent design, combining quantitative data from questionnaires based on the Meta AI Literacy Scale (MAILS) and qualitative data from structured interviews. The results show that, in general PBA student's AI literacy level is in the medium category. Students generally have an understanding and ability to use AI, but are still weak in aspects of technology creation and development. Supporting factors include ease of access, digital habits, and lecturer support, while inhibiting factors are limited infrastructure, the lack of integration of AI into the curriculum, and limited accuracy. The implications of AI literacy include benefits in searching for references and materials, personalized learning, translation, and strengthening language skills, but also potentially pose risks such as dependency, decreased basic language competency, inaccurate/miscontextualized information, and plagiarism. This study recommends integrating AI into the curriculum, training for lecturers and students, and providing adequate digital facilities.

Keywords: Literacy, Artificial Intelligence, AI Literacy, Students of Arabic Language Education, Arabic Language Learning.

Abstrak

Penelitian ini bertujuan untuk mengetahui tingkat literasi AI pada mahasiswa Pendidikan Bahasa Arab (PBA) ISQI Sunan Pandanaran, menganalisis faktor-faktor yang mempengaruhi tingkat literasi tersebut, serta mengeksplorasi implikasinya dalam pembelajaran bahasa Arab. Penelitian ini menggunakan metode kombinasi dengan desain konvergen, yang menggabungkan data kuantitatif melalui kuesioner berbasis Meta AI *Literacy Scale* (MAILS) dan data kualitatif melalui wawancara terstruktur. Hasil penelitian menunjukkan bahwa secara umum, tingkat literasi AI mahasiswa PBA berada pada kategori sedang. Mahasiswa umumnya memiliki pemahaman dan kemampuan penggunaan AI, namun masih lemah dalam aspek kreasi dan pengembangan teknologi. Faktor pendukung meliputi kemudahan akses, kebiasaan digital, dan dukungan dosen, sedangkan faktor penghambat adalah keterbatasan infrastruktur, belum terintegrasinya AI dalam kurikulum, dan keterbatasan akurasi. Implikasi dari literasi AI mencakup manfaat dalam pencarian referensi dan materi, personalisasi pembelajaran, penerjemahan, dan penguatan keterampilan bahasa, tetapi juga berpotensi menimbulkan risiko seperti ketergantungan, penurunan kompetensi dasar bahasa, informasi yang tidak akurat/salah konteks, serta plagiarisme. Penelitian ini merekomendasikan pengintegrasian AI ke dalam kurikulum, pelatihan bagi dosen dan mahasiswa, serta penyediaan fasilitas digital yang memadai.

Kata Kunci: *Literasi, Artificial Intelligence, Literasi AI, Mahasiswa Pendidikan Bahasa Arab, Pembelajaran Bahasa Arab.*

INTRODUCTION

Technological advances have brought us into the era of Society 5.0, a social order that connects the physical and digital worlds in a tangible way. In this era, technology is not just a tool but a means to improve the quality of human life.¹ This digital transformation significantly impacts various sectors, including education, where Artificial Intelligence (AI) becomes one of the crucial issues that needs to be addressed.

This AI adoption phenomenon is particularly pronounced in Indonesia. Data from Tirto.id shows that Indonesia ranks third globally regarding visits to AI websites. Approximately 1.4 billion visits to AI platforms originated in Indonesia between September 2022 and August 2023. This impressive figure indicates a very high level of AI adoption among Indonesians.

A further survey by Tirto.id revealed another interesting fact: of the 1,501 students aged 15-21 surveyed, 86.21% admitted using AI to assist them with their academic assignments. These respondents comprised both high school and college students, with college students accounting for

¹ Mitra Rahayu, Machmud Yunus, dan dkk, *Model Pembelajaran Di Era Society 5.0* (Padang: Gita Lentera, 2024).

nearly 56%.² This data clearly demonstrates that AI has become a very popular tool among high school and college students in their learning process.

AI in higher education offers several important benefits for students, including those majoring in PBA students. Research by Evy Nur Rohmawaty and her team identified several forms of AI that are highly useful in Arabic language learning. These include chatbots and virtual assistants that can assist in direct interaction, provide feedback, and facilitate more targeted practice. Second, machine translation can simplify access to Arabic texts by automatically translating them. Third, natural language processing allows for in depth analysis of Arabic. And fourth, Chat GPT, You AI, and Google Bardi can open new opportunities in learning with interactive platforms, extensive reference sources, and integrated AI capabilities.³ PBA ISQI Sunan Pandanaran students, for example, have begun integrating AI into their lectures, utilizing it for discussions, assignments, and searching for learning resources.

AI is believed to help humans improve learning and achieve desired educational goals. The application of AI in education offers promising potential and increases the efficiency, effectiveness, and quality of learning. Despite its many advantages, AI also carries potential risks and negative impacts if not utilized responsibly. Sri Suning Kusumawardani, Director of Learning and Student Affairs, in “*Panduan Penggunaan Artificial Intelligence (GenAI) Pada Pembelajaran Di Perguruan Tinggi*” emphasized that AI can trigger problems such as plagiarism and dependency. This, absolutely, risks hindering the primary goal of higher education, which is to develop students' creativity and critical thinking skills.⁴

Mitigating the potential negative impacts of AI use, AI literacy among university students is crucial. This literacy encompasses more than just knowing about AI, but also encompasses a deep understanding of how it works, the ability to apply it in various contexts, and the skills to ethically evaluate its implications. Therefore, this study examines explicitly the AI literacy level of PBA ISQI Sunan Pandanaran students, encompassing AI knowledge and understanding, AI use and application, AI evaluation and creation, and ethical awareness related to AI.

This study offers significant novelty through its exclusive focus on AI literacy among PBA students. Unlike previous studies, which have primarily focused on the utilization or use of AI in Arabic language learning, this study explores explicitly students' level of understanding, application

² Alfons Yoshio Hartanto dan Fina Nailur Rohmah, “Makin Marak Siswa Pakai AI Untuk Mengerjakan Tugas,” 2023.

³ Evy Nur Rohmawaty et al., ‘Peran Artificial Intelligence (AI) Dalam Pembelajaran Bahasa Arab Mahasiswa Pascasarjana UIN Maulana Malik Ibrahim Malang’, *Khatulistiwa: Jurnal Pendidikan Dan Sosial Humaniora* 4, no. 3 (26 July 2024): 316–28, doi:10.55606/khatulistiwa.v4i3.4023.

⁴ Berry Juliandi et al., *Panduan Penggunaan Artificial Intelligence (GenAI) Pada Pembelajaran Di Perguruan Tinggi* (Jakarta: Kementerian Pendidikan Tinggi, Sains, dan Teknologi, 2025).

skills, and ethical awareness of AI technology. This is crucial given that AI's moral significance and dynamics in teaching a foreign language such as Arabic are rarely explored from a comprehensive literacy perspective. Furthermore, this study employed a mixed methods approach. By combining qualitative and quantitative techniques, this study is expected to provide a more thorough analysis of the level of AI literacy among PBA students. Through this innovative approach, it is hoped that the level of AI literacy among PBA students can be identified and used to design strategies for developing their competency. Furthermore, this research is expected to provide an initial overview for designing technology based policies or implementations in PBA programs.

METHOD

This research uses mixed methods research, namely an approach that combines quantitative and qualitative elements to produce broader and more in-depth data.⁵ The design used is a convergent design, where quantitative and qualitative data are collected and analyzed separately, and then the results are combined to obtain a holistic understanding.⁶

The data sources in this study are divided into two types: primary and secondary. Primary data sources are information obtained directly from the research subjects, namely active students of the PBA ISQI Sunan Pandanaran, a total of 69 people. Meanwhile, secondary data sources serve as support for primary data, including books, journals, theses, documents, and various other reading sources relevant to the research topic.⁷

Data collection was conducted using several techniques. A questionnaire was distributed to PBA ISQI Sunan Pandanaran students via Google Forms to measure their AI literacy levels. The instrument used was adapted from *Meta AI Literacy Scale (MAILS)*, a flexible self-assessment questionnaire to measure AI literacy.⁸ Additionally, structured interviews were conducted with several students to explore factors influencing their AI literacy and its implications for Arabic language learning. Finally, documentation techniques were used to collect event notes or relevant documents as supporting data.

Data analysis was divided into two parts. Quantitative data from the questionnaires were analyzed using descriptive statistics with the help of Microsoft Excel and SPSS software to illustrate student's AI literacy levels through calculations of the mean, median, mode, standard

⁵ John W. Creswell, *A Concise Introduction to Mixed Methods Research* (Los Angeles: Sage Publication, 2015).

⁶ Creswell, A Concise Introduction.

⁷ Muh. Yani Balaka, *Metode Penelitian Kuantitatif* (Bandung: Widina Bhakti Persada, 2022).

⁸ Astrid Carolus et al., 'MAILS - Meta AI Literacy Scale: Development and Testing of an AI Literacy Questionnaire Based on Well-Founded Competency Models and Psychological Change- and Meta-Competencies', *Computers in Human Behavior: Artificial Humans* 1, no. 2 (August 2023): 100014, doi:10.1016/j.chbah.2023.100014.

deviation, and percentage. The results were then presented in diagrams. Meanwhile, qualitative data from interviews were analyzed using thematic analysis to identify patterns and themes related to the influencing factors and implications of AI literacy in Arabic language learning. The thematic analysis process included data collection (interviews), transcription, open coding, code grouping, and interpretation of themes to obtain a comprehensive picture.⁹

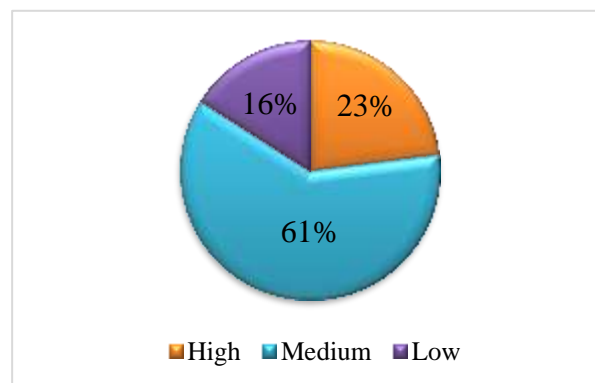
RESULT AND DISCUSSION

AI Literacy Level of PBA ISQI Sunan Pandanaran Students

Analysis of AI Literacy Level of PBA ISQI Sunan Pandanaran Students in General

The data for this study were obtained through the distribution of a questionnaire as a research instrument. The data were coded, edited, scored, tabulated, and analyzed. The results of this data processing can be seen in Figure 1:

Figure 1. AI Literacy Level Diagram of PBA ISQI Sunan Pandanaran Students



As reflected in Figure 1, 23% of PBA ISQI Sunan Pandanaran students have a high level of AI literacy; 61% of students have a medium level of AI literacy; and 16% of students have a low level of AI literacy.

Analysis of AI Literacy Level of PBA ISQI Sunan Pandanaran Students for Each Component

After explaining the general AI literacy levels of PBA ISQI Sunan Pandanaran students, we will discuss their AI literacy levels for each component. These components include:

First, AI Literacy (AIL) which is the ability to recognize, understand, and use AI effectively in various life contexts.¹⁰ The data analysis showed that most students were able to distinguish between devices that use AI and those that don't, and that they were already able to use AI in their

⁹ Najmah et al., *Analisis Tematik Pada Penelitian Kualitatif* (Jakarta: Salemba, 2023).

¹⁰ Carolus et al., 'MAILS - Meta AI Literacy Scale: Development and Testing of an AI Literacy Questionnaire Based on Well-Founded Competency Models and Psychological Change- and Meta-Competencies'.

daily lives, particularly in lectures. Quantitatively, in the AI Literacy component, students fell into the moderate category, with 47% responding neutrally to the items in this component.

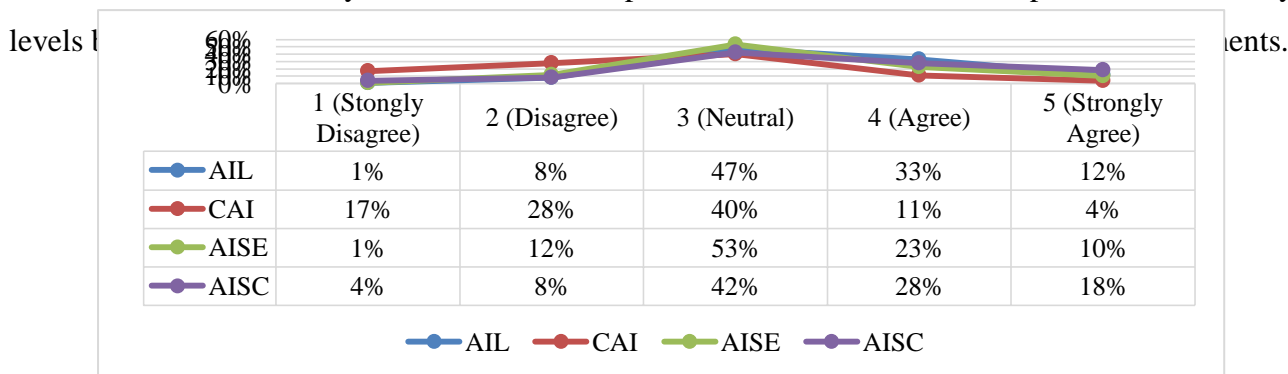
Second, Create AI (CAI), which is a component that highlights the ability to design and develop AI systems.¹¹ Most students lack the skills to design new AI applications. In the Create AI component, students fell into the low category, as 45% of them disagreed with the statements in the distributed questionnaire.

Third, AI Self Efficacy (AISE), which refers to an individual's confidence in their ability to learn about AI and apply it to solve problems.¹² The data processing results indicate that, on average, students already have confidence in their ability to learn about AI and apply it to solve problems. For example, students can complete complex and challenging tasks when working with AI. However, some students feel they are still unable to handle most AI related problems well independently, such as when an application error occurs or when the application does not produce the output they expected. Quantitatively, in this component, students are included in the moderate category, as 53% of students responded neutrally to the statement items in this component.

Fourth, AI Self Competency (AISC), which refers to skills such as AI persuasion literacy and emotion regulation, which are important for managing one's interactions with AI systems and understanding their impact on personal and professional life.¹³ Most students are able to prevent AI from influencing important decisions in their lives. They are also able to prevent AI technology from influencing the decisions they make in their daily lives. However, some students are still unable to control feelings of frustration or anxiety that arise when using AI technology. In this AI Self Competency component, students are included in the high category, as 46% of students agreed with the statement items in the distributed questionnaire.

Comparison of AI Literacy Levels Between Components

Once the AI literacy level for each component is known, we can compare the AI literacy



¹¹ Carolus, MAELS - Meta AI literacy scale.

¹² Carolus, MAELS - Meta AI literacy scale.

¹³ Carolus, MAELS - Meta AI literacy scale.

From the graph, it can be concluded that the AI literacy levels of PBA ISQI Sunan Pandanaran students in the AI Literacy, AI Self Efficacy, and AI Self Competency components show a similar trend, with a higher number of neutral and affirmative responses. Meanwhile, the Create AI component shows a different trend compared to the other three components, with disapproval responses predominating over approval responses.

This indicates that PBA ISQI Sunan Pandanaran students generally possess a good knowledge of the understanding, use, recognition, and ethics of AI. Furthermore, they have the confidence to learn about AI and apply it to problem solving, and possess skills such as AI persuasion literacy and emotional regulation. However, they do not yet possess the ability to design, program, and develop AI applications.

Factors Affecting AI Literacy Level

To identify the supporting and inhibiting factors affecting the level of AI literacy among PBA students at ISQI Sunan Pandanaran, we conducted interviews with several students. This section presents the findings from these interviews, which show the student's perspectives on both the supporting and inhibiting factors that shape their AI literacy level.

Supporting Factors

The interview findings reveal several supporting factors that contribute to AI literacy level among students of PBA ISQI Sunan Pandanaran are as follows:

First, accessibility and user friendliness. AI is no longer a complex technology limited to experts. In fact, AI has become highly user friendly and easily accessible to students, enabling them to utilize AI tools and platforms without requiring technical or programming skill.

Several factors explain why AI has become accessible and user friendly for students, including: (1) An intuitive user interface. Most AI platforms are designed with a simple and easy to understand interface, which facilitates student adoption and use. Students just have to write questions or prompts naturally, and AI will respond to them accordingly. (2) Wide accessibility. Most AI applications are available online, either through web browsers or mobile applications. Many of them are free of charge, making AI widely accessible to students without requiring special devices or incurring additional costs. (3) Fast and efficient response. AI can process information and respond in a second. This speed can help students dealing with deadlines so they can finish their tasks efficiently without any technical problems. (4) Availability of guides and tutorials. In case of difficulties, most AI platforms provide guides, tutorials, or online communities that are readily

available to assist. This further facilitates students in learning and optimizing the use of AI for their various academic purposes.

This aligns with the Perceived Ease of Use (PEOU) concept proposed by Fred Davis in the Technology Acceptance Model (TAM), which defines PEOU as the degree to which an individual believes that using a system or technology will be effortless. Thus, when a technology is perceived as easy to learn, simple to operate, and clearly understandable, its perceived ease of use is considered high.¹⁴ In the context of students' AI literacy, if AI is considered as an accessible and easy to use tool (having a high level of Perceived Ease of Use), students would be motivated to experiment, learn, and integrate AI to their learning process, which could support their AI literacy.

Second, basic understanding of technology or digital habits. PBA ISQI Sunan Pandanaran students belong to Generation Z, which indicates that they are digital natives. Prensky stated that digital natives belong to those who were born and raised in the digital era, so digital technology becoming an integral part of their lives, which has shaped the way they think, learn, and interact with the world.¹⁵ Being accustomed to the ever-changing dynamics of technology, digital natives tend to adapt quickly to AI tools. They often perceive AI as a natural extension of the digital tools they are already familiar with. As a result, they can easily integrate AI into their learning routines, tasks, and even help them in social interactions. For instance, they may use AI to summarize lecture materials, generate ideas for assignments, create social media content, or simply for entertainment purposes. For them, AI is not something unfamiliar but rather an integral part of their familiar digital ecosystem, which significantly supports their level of AI literacy.

Third, lecturers play an active role in providing an AI exploration space for students. One of the important key supporting factors of AI literacy is the lecturer's initiatives in creating supportive environments and providing practical opportunities that encourage experiments and independent learning. Such support can be provided by recommending free or affordable AI platforms, offering access to tutorials, webinars, or online courses, and integrating AI-based assignments or discussions into the learning process. In doing so, lecturers empower students to become active learners who not only receive information but also take ownership of their AI literacy development through direct learning and structured exploration.

This aspect aligns with David Kolb's Experiential Learning concept (learning by experimenting) and is further supported by the findings of Sarah Gnoth and Jasminko Novak, who

¹⁴ Nguyen Binh Phuong Duy et al., 'AI-Assisted Learning: An Empirical Study on Student Application Behavior', *Multidisciplinary Science Journal* 7, no. 6 (14 November 2024): 2025275, doi:10.31893/multiscience.2025275.

¹⁵ Marc Prensky, *Digital Natives, Digital Immigrants* (West Yorkshire: MCB University Press, 2001).

stated that learners' direct engagement in practicing with AI sharpen both their conceptual understanding and technical skills at the same.¹⁶

Inhibiting Factors

Alongside supporting elements, several inhibiting factors also shape the level of AI literacy among PBA ISQI Sunan Pandanaran students. Identifying these barriers is crucial for determining areas that need attention and intervention to improve AI literacy.

The first challenge concerns limited access to computer equipment and internet connectivity. Students reported that the lack of campus facilities, such as computers or laptops, along with unstable internet connections, hindered their exploration of AI. Consequently, many relied on personal devices and networks, yet nearly half of the students do not own a computer or laptop, further restricting their engagement with AI tools.

The lack of adequate computer devices and internet connectivity hinders the development of student's AI literacy, especially when universities are unable to provide sufficient facilities. According to Van Dijk's Digital Divide theory, disparities in technology access will ultimately lead to disparities in digital skills.¹⁷ Thus, students who did not have personal devices and had to rely on unstable internet connections could miss the opportunity to explore AI comprehensively.

Third, the lack of AI integration into the curriculum. This is reflected in the absence of compulsory or elective courses that address the basics of AI, the lack of AI-related material in existing course syllabi, and the limited involvement of students in projects or research utilizing AI. Universities that have not yet integrated AI into their curricula fail to proactively equip students with the knowledge and skills required to compete in the job market and adapt to a society increasingly shaped by AI technologies. In his study, Sijabat highlights that the absence of AI accommodation in curriculum design may obstruct learning outcomes and restrict student's progress toward AI literacy.¹⁸

Fourth, limitations of accuracy. Several students observed that AI frequently produces inaccurate outputs in the context of Arabic learning, particularly in tasks such as translation, the application of vowel markings (*ḥarakāt*), and grammatical parsing (*i' rāb*). These concerns are supported by previous research, which underscores accuracy constraints in AI-generated responses, including the predominance of nominal sentence structures, the recurrent misuse of verbs,

¹⁶ Sarah Gnoth and Jasminko Novak, 'Supporting AI Literacy Through Experiential Learning: An Exploratory Study', 2025, 233–51, doi:10.1007/978-3-031-93746-0_17.

¹⁷ Jan A.G.M. Van Dijk, *The Deepening Divide: Inequality in the Information Society* (London: SAGE Publications, 2005).

¹⁸ Jelice Twista Sijabat et al., 'Kebijakan Untuk Meningkatkan Literasi AI Di Kalangan Mahasiswa', *Jurnal Riset Rumpun Ilmu Bahasa* 4, no. 1 (11 April 2025): 01–12, doi:10.55606/jurribah.v4i1.4316.

inconsistencies in pronoun usage, and unsystematic repetition of vocabulary.¹⁹ This bias and inaccurate information from AI may lead to negative impacts on their understanding and belief in this technology. This statement is reinforced by previous research, which indicates that the quality of responses generated by AI has not yet met user expectations, which may result in reduced user trust.²⁰ Inaccuracies, bias, and limitations in AI-generated responses pose significant challenges that not only undermine the reliability of information but also fundamentally impact user's trust and their capacity to develop critical AI literacy.

Implications of AI Literacy in Arabic Language Learning

AI Literacy significantly influences Arabic language learning, offering innovative opportunities alongside challenges that must be addressed.

Opportunities

The rise of AI literacy among students opens up vast possibilities for reshaping Arabic language learning. Below are several opportunities for utilizing AI in Arabic language education:

First, personalized learning. AI can facilitate in creating learning experiences tailored to individual needs. Students are able to learn at their own pace and receive feedback appropriate to their skill levels. This aligns with previous research indicating that AI-driven language learning tools can significantly enhance language acquisition by providing personalized learning experiences, increasing learner engagement, and improving skill development in a particular areas such as vocabulary retention and pronunciation.²¹

Second, assisting in reference searching and understanding difficult material. Several students consistently reported that AI supports them in finding references, materials, ideas, and even books related to Arabic language learning. In addition, AI can provide explanations that are easier to understand or more detailed than manual searches, thereby accelerating the learning process and the completion of assignments. This is supported by the research of Rohmawaty et al., which highlights that AI tools such as ChatGPT, You AI, and Google Bard have expanded access to learning

¹⁹ Mai Zaki and Ahmed Ali, 'Can AI-Generated Materials Help in Arabic Teaching? A Study of Potential and Pitfall', in *The Sharjah International Conference on AI & Linguistics* (UAE: American University of Sharjah & Emirates Scholar Center for Research and Studies, 2024).

²⁰ Irwansyah Suwahyu et al., 'Analisis Pengaruh Kepercayaan Dan Pemanfaatan Teknologi Terhadap Penggunaan Chat-GPT', *INTEC Journal: Information Technology Education Journal* 3, no. 2 (May 2024).

²¹ Ali Ahmad Yenuri, 'AI-Powered Language Learning: A New Frontier in Personalized Education', *Journal of Language Instruction and Applied Linguistics* 1, no. 2 (November 2024).

resources by offering interactive platforms, extensive reference materials, and integrated more complex AI capabilities.²²

Third, rapid translation. Several students reported using AI to translate materials between Arabic and Indonesian, which significantly helps them in situations where they are pressed for time or encounter complex vocabulary. They recognize that AI can facilitate the comprehension of Arabic texts. Previous studies have suggested that AI can serve as a translation aid for language learners. However, its use should not be isolated; AI-assisted translation should be integrated with traditional translation knowledge to ensure accuracy and deeper understanding. This underscores the continued importance of studying Arabic translation theory, including syntax, morphology, semantics, and lexicology. AI should serve merely as a supportive tool to make translation more efficient and adaptable to technology.²³

Fourth, improving Arabic language skills, such as listening, writing, reading, and speaking. According to several students, AI can support the practice of Arabic pronunciation by comparing their speech with standard pronunciation and providing detailed corrections on intonation, stress, and articulation (*makhraj*) of letters. For writing skills, AI can assist in sentence construction, grammar correction, idea development, and vocabulary enrichment. In terms of reading, AI helps students understand challenging Arabic texts and interpret unfamiliar words. Regarding speaking skills, AI-powered chatbots can simulate conversations with native Arabic speakers, allowing students to practice at any time without fear of making mistakes in front of instructors or peers, which is invaluable for developing fluency. These findings align with previous research indicating that AI can function as an interactive learning assistant, enabling learners to practice speaking and writing while receiving instant grammar explanations. The feedback provided by the chatbot enables students to correct their errors quickly and effectively.²⁴

Challenges

Although AI literacy offers significant benefits in enhancing the effectiveness and efficiency of learning, interviews with PBA ISQI Sunan Pandanaran students also revealed several negative implications arising from the uncritical and unreflective use of AI. First, dependence on AI. Most students rely on AI to complete academic tasks quickly. This dependence can undermine learning autonomy and reduce motivation to engage with materials independently through books,

²² Rohmawaty et al., 'Peran Artificial Intelligence (AI) Dalam Pembelajaran Bahasa Arab Mahasiswa Pascasarjana UIN Maulana Malik Ibrahim Malang'.

²³ Ibtisyamah Hizam, Yek Amin Aziz, dan Ahmad Sirojul Hakiki, "Integrasi Artificial Inteligence (AI) Sebagai Alat Bantu Dalam Penerjemahan Bahasa Arab – Indonesia," *Shaut Al-'Arabiyah* 13, no. 1 (May 2025).

²⁴ Supriyanto dan Nur Toifah, "Efektifitas Penggunaan Artificial Intelligence (AI) Dalam Pembelajaran Bahasa Arab di Era Society 5.0: Systematic Literature Review," *Lugawiyat* 6, no. 2 (November 25, 2024): 42–54, doi:10.18860/lg.v6i2.29713.

dictionaries, or scholarly discussions. This finding aligns with the Law of Least Effort, which asserts that individuals tend to select the path requiring the least effort to accomplish a goal.²⁵ In this context, students tend to favor AI due to its practicality and speed compared to consulting books or composing work independently. Expressions such as “faster,” “no need to think too hard,” or “just ask” indicate a preference for immediate solutions to complete assignments. Such choices demonstrate student’s inclination to minimize cognitive effort, relying more on instant AI-generated responses than deep reading or independent critical thinking. This behavior corresponds with Zipf’s theory, which emphasizes that cognitive efficiency is a key factor in decision-making.

Second, excessive reliance on AI may weaken fundamental language skills. In Arabic learning, overuse of AI can hinder student’s abilities in reading unvocalized texts, composing sentences, and understanding grammatical rules. According to Piaget’s Cognitive Theory, students who bypass independent thinking and analysis fail to form new cognitive schemas, resulting in superficial knowledge and weakened language proficiency.²⁶

Third, the risk of inaccurate or miscontextualized information. AI has limitations in understanding the cultural, literary, and religious context of Arabic, often producing errors, overly literal translations, or inconsistencies with original meanings, particularly in classical Islamic texts. This may mislead students if not cross-checked with authoritative sources. Safiya Noble’s theory of Algorithmic Bias highlights that algorithms are not neutral and can reproduce biases present in their training data.²⁷ In the context of Arabic language learning, AI carries the risk of providing overly literal, misinterpreted, or even religiously inconsistent information. This occurs because AI lacks cultural awareness or spiritual understanding, relying solely on statistical patterns from its training data.

Fourth, the risk of plagiarism and ethical concerns. The growing use of AI in academic assignments may encourage plagiarism and compromise student’s academic integrity. This issue can be understood through Bélanger and Crossler’s Digital Ethics in AI Use framework, which highlights the necessity of ethical awareness when utilizing digital technologies, including AI.²⁸ In Arabic language learning, students who replicate AI-generated content without modification or critical engagement not only forfeit important learning experiences but also breach academic honesty. Although AI can produce well-structured texts or translations, these outputs do not

²⁵ George Zipf, *Human Behavior and the Principle of Least Effort* (Cambridge: MA: Addison-Wesley Press, 1949).

²⁶ Jean Piaget, *The Psychology of Intelligence* (London: Routledge, 2001).

²⁷ Safiya Umoja Noble, *Algorithms of Oppression: How Search Engines Reinforce Racism* (New York: NYU Press, 2018).

²⁸ France Bélanger and Robert E. Crossler, ‘Ethical Challenges in the Digital Age: Privacy, Security, and AI Use’, *Journal of Business Ethics* 170, no. 3 (2021).

represent the student’s own competence without active intellectual contribution. The ethical risk is heightened by limited digital ethics literacy, as students may not realize that uncredited or unprocessed use of AI constitutes covert plagiarism. Therefore, AI literacy must be developed alongside ethical literacy so that technology is used responsibly in the academic process.

CONCLUSION

This study concludes that the level of AI literacy among PBA students at ISQI Sunan Pandanaran falls within the medium category. Students demonstrate a reasonably good understanding in the components of AI Literacy, AI Self-Efficacy, and AI Self-Competency, but show lower proficiency in AI Creation. Supporting factors such as ease of access, digital habits, and lecturer support play a significant role in enhancing AI literacy, whereas major obstacles include limited facilities, the lack of AI integration in the curriculum, and inaccuracies in AI-generated information. The implications of AI literacy for Arabic language learning reveal considerable potential in personalized learning, translation, and skill development, yet also pose risks such as dependence, weakening of fundamental language skills, misinformation, and ethical challenges if used without critical and ethical awareness.

To improve AI literacy among students, it is recommended that AI be gradually integrated into the curriculum, accompanied by training for both lecturers and students. Additionally, adequate digital facilities and ethical guidance should be provided to encourage responsible and effective use, thereby enhancing AI literacy among PBA students at ISQI Sunan Pandanaran.

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