The Use of Generative Artificial Intelligence (AI) in Arabic Language Education: Insights and Implications between Malaysia and Indonesia

Muhammad Sabri Sahrir[1]*, Azkia Muharom Albantani[2], Fatkhul Arifin[3], Fathudin[4]

[1]Kulliyyah of Education, International Islamic University Malaysia, 53100 Gombak,Kuala Lumpur, Malaysia

[2,3,4]Universitas Islam Negeri Syarif Hidayatullah Jl. Ir. H. Djuanda No. 95 Ciputat, Kota Tangerang Selatan 15412 Jakarta, Indonesia

***Corresponding author**

DOI: https://dx.doi.org/10.47772/IJRISS.2025.90300288

Received: 13 March 2025; Accepted: 18 March 2025; Published: 15 April 2025

ABSTRACT

Generative AI has emerged as a transformative tool in education, offering innovative solutions for Arabic language learning and teaching. This study explores the integration of generative AI technology in Arabic language education, focusing on its impact on student learning experiences and outcomes in Malaysia (IIUM) and Indonesia (UIN Jakarta). Examining AI's role across five key dimensions—learning effectiveness, student engagement, accuracy in context understanding, learning adaptability and collaboration, and user acceptance and satisfaction—this study employed a quantitative survey involving over 500 undergraduate students between November and December 2024. Findings indicate that AI enhances learning effectiveness, engagement, and adaptability while addressing structural challenges in Arabic learning. However, limitations persist in AI's contextual accuracy, cultural sensitivity, and ability to interpret idiomatic expressions. Future research should focus on refining AI's cultural and linguistic sensitivity by integrating region-specific language models and collaborating with native Arabic educators to enhance accuracy, contextual awareness, and cultural appropriateness. Additionally, AI's seamless integration with traditional teaching methodologies should be prioritized to ensure it serves as a complementary tool rather than a replacement in Arabic language education.

Keywords: Arabic language learning, generative AI, technology-assisted learning, student engagement, language acquisition.

INTRODUCTION

The rapid advancement of technology has revolutionized various sectors, including education. Among the most significant developments in educational technology is the use of artificial intelligence (AI) tools, such as chatbots (Mageira et al., 2022). These AI-powered conversational agents are increasingly utilized in language learning, providing interactive and personalized learning experiences (Du & Daniel, 2024). While extensive research has explored the use of generative AI in languages such as English and Spanish, its application in Arabic language education remains relatively underexplored. This study seeks to address this gap by investigating the effective use of generative AI in learning Arabic, with a particular focus on students' perspectives. In higher education, Arabic language instruction is often a core component of the curriculum, especially in institutions across the Middle East, North Africa, Southeast Asia, and Islamic studies departments worldwide. However, teaching Arabic at the university level presents unique challenges (Soliman & Khalil, 2022). Unlike other languages, Arabic is marked by diglossia—the coexistence of Modern Standard Arabic (MSA) and various regional dialects (Abu-Rabia et al., 2022). This linguistic duality complicates the learning process, as students must navigate between the formal written language used in academic contexts and the colloquial dialects spoken in daily life.

Furthermore, Arabic's intricate grammatical structure, which includes root-based morphology and complex verb conjugations, demands a high level of cognitive engagement from learners. The cultural context enriches the learning experience but also adds complexity, as students must master both the language and the cultural nuances embedded within it (Kearney, 2016; Singh & Doherty, 2004). These challenges are often exacerbated by the limited availability of native Arabic speakers in some educational settings, making it difficult for students to practice speaking and listening skills outside the classroom. The integration of technology into language learning has been widely studied, with extensive research showcasing the benefits of digital tools in enhancing language acquisition and proficiency. Among these, generative AI technologies have emerged as a groundbreaking innovation due to their ability to simulate human-like conversations (Guingrich & Graziano, 2024).

These tools enable learners to practice language skills in real-time, personalized, and interactive environments (Huang et al., 2022; Al-Moghrabi & Al-Ghonmein, 2024). Notably, generative AI has demonstrated significant potential in improving language proficiency, particularly in areas such as vocabulary development and conversational fluency (Kim et al., 2019; Petrović & Jovanović, 2021; Zhang & Huang, 2024). Furthermore, Wang et al. (2023) emphasize the importance of higher education institutions actively shaping the scope and application of AI to support international students' learning needs. These capabilities position generative AI as a promising solution for addressing language learning challenges across diverse linguistic and educational contexts (Husain & Housni, 2024).

In a study by Nurkhamimi et al. (2024), the findings underscore the critical need for educators and policymakers to establish comprehensive guidelines for the ethical and responsible use of AI in language education. While extensive research has explored the application of generative AI in widely spoken languages (Nizzolino, 2024), its effectiveness in Arabic language education remains an area ripe for further exploration (Alsubayhay, Salam, & Mohamed, 2022; Rahmawati, Budi, & Fatchiatu, 2023; Ouali & Said, 2024). This gap highlights unique challenges, particularly regarding the ability of generative AI to accurately represent the linguistic complexity and cultural depth of Arabic. Key questions arise: Can these tools effectively reflect the rich cultural contexts embedded in the language? How do students perceive their effectiveness in addressing such challenges? This study seeks to address these questions by investigating the role of generative AI in Arabic language education, with a focus on higher education students' perceptions and usage of these tools to overcome barriers in learning Arabic. By examining both the strengths and limitations of generative AI in this context, the research aims to provide valuable insights into how these digital tools can be effectively leveraged to enhance the learning experience, navigate linguistic and cultural challenges, and ultimately advance the efficacy of Arabic language education.

METHODOLOGY

This study utilized a quantitative survey to gain valuable insights into students' experiences with generative AI in Arabic language education. The research was conducted with undergraduate students from two institutions through disseminated online survey via Google Form: the International Islamic University Malaysia (IIUM) and Universitas Islam Negeri Syarif Hidayatullah Jakarta (UIN). A total of 338 students participated, including 92 from IIUM and 246 from UIN, all of whom were actively enrolled in Arabic language courses. The investigation centered on five critical themes: learning effectiveness (Nguyen, 2015), student engagement (Kim & Baylor, 2007), accuracy in understanding context (Oxford, et. al., 2018), learning adaptability and collaboration (Ramesh & Jayashree, 2024), and user acceptance and satisfaction (Ellis & Shintani, 2014).). These themes provided a comprehensive framework for analysing the impact of generative AI on Arabic language learning experiences.

To ensure the robustness and reliability of the research instruments, a systematic validation and testing process was implemented. Instrument validity was established through expert reviews and pilot testing. A panel of three subject matter experts in Arabic language education and educational technology assessed the survey questionnaire for content relevance, clarity, and alignment with the research objectives. This review ensured that the instruments accurately captured students' perceptions and experiences with generative AI in learning Arabic. Following this, the instruments were pilot tested with a group of 30 students who were not part of the main study. Feedback from the pilot group was used to refine and enhance the instruments further. Reliability

of the survey data was verified using Cronbach's alpha, with values of 0.80 or higher deemed acceptable for consistent measurement across survey items.

The survey responses then were interpreted using a 6-point Likert scale, as detailed in Table 1 below. This systematic approach to data collection and analysis ensured the findings accurately reflected students' experiences and perceptions, thereby supporting the study's aim of understanding the potential and challenges of generative AI in Arabic language learning.

Table 1: Interpretation of Results and Findings (6 Likert Scales)

Mean Score	Level of Interpretation
1.00–2.99	Low
3.00–4.99	Moderate
5.00–6.00	High

RESULTS AND FINDINGS

This section presents the results and findings derived from the analysis of data collected during the study. The findings are organized according to the key themes investigated: Learning Effectiveness, Student Engagement, Accuracy of Context Understanding, Learning Adaptability and Collaboration, and User Acceptance and Satisfaction. These themes were chosen to comprehensively assess the impact and utility of generative AI in Arabic language education, particularly from the perspective of students at the International Islamic University Malaysia (IIUM) and Universitas Islam Negeri Syarif Hidayatullah Jakarta (UIN) as shown in Table 2 until Table 6 as follows:

Table 2: Learning Effectiveness

No.	Items	Mean Score	Interpretation
1	Generative AI enhances learning new Arabic vocabulary.	5.34	High
2	Generative AI significantly improves understanding of Arabic grammar.	5.26	High
3	Generative AI contributes positively to reading comprehension in Arabic.	5.33	High
4	Generative AI supports the development of Arabic writing skills.	5.17	High
5	Generative AI accelerates the understanding of complex Arabic materials.	5.25	High
6	Generative AI provides clear and constructive feedback.	4.74	Moderate
7	Generative AI facilitates regular listening exercises in Arabic.	5.09	High
8	Generative AI promotes faster learning compared to traditional methods.	5.07	High
9	Generative AI aids in mastering Arabic idioms and expressions.	4.82	Moderate
10	Generative AI enhances pronunciation practice for Arabic.	5.22	High

Table 2 illustrates the effectiveness of generative AI in enhancing various aspects of Arabic language learning. Across ten parameters, generative AI demonstrated high performance in most areas, as indicated by mean scores above 5.0. Notable strengths include its ability to enhance vocabulary acquisition (5.34), improve grammar understanding (5.26), and contribute to reading comprehension (5.33). Additionally, it supports the development of writing skills (5.17), accelerates the understanding of complex materials (5.25), and facilitates pronunciation practice (5.22).

Generative AI was also effective in promoting faster learning compared to traditional methods (5.07) and facilitating regular listening exercises (5.09). However, moderate scores were observed in areas like providing clear and constructive feedback (4.74) and aiding in the mastery of idiomatic expressions (4.82). These

findings indicate that while generative AI is highly effective in key learning domains, some aspects, such as nuanced feedback and cultural expressions, require further improvement to fully support language learners.

Table 3: Learning Engagement

No.	Items	Mean Score	Interpretation
1	Generative AI usage in Arabic learning occurs regularly each week.	4.93	High
2	Generative AI makes Arabic learning more interesting.	5.39	High
3	Generative AI increases motivation to learn Arabic.	5.32	High
4	Generative AI offers interactive learning experiences.	5.15	High
5	Generative AI helps maintain focus during learning sessions.	4.91	Moderate
6	Generative AI encourages perseverance when facing learning challenges.	5.24	High
7	Generative AI increases engagement in Arabic learning.	5.08	High
8	Generative AI fosters active participation in Arabic lessons.	5.11	High
9	Generative AI simplifies access to learning materials.	5.42	High
10	Generative AI provides useful progress-tracking features	5.26	High

Table 3 highlights the role of generative AI in fostering learning engagement among students in Arabic language education. Generative AI received high ratings for making learning more interesting (5.39), increasing motivation (5.32), and simplifying access to materials (5.42). It also performed well in providing interactive learning experiences (5.15) and progress-tracking features (5.26). Students appreciated its ability to foster active participation in lessons (5.11) and encourage perseverance when facing challenges (5.24). However, a slightly lower, yet moderate score (4.91) was observed in maintaining focus during learning sessions.

These findings indicate that generative AI effectively enhances student engagement through interactive and motivational features, particularly by making learning sessions more dynamic and accessible. Areas like maintaining focus could benefit from further refinement to maximize engagement outcomes. Overall, generative AI emerges as a powerful tool for creating an engaging learning environment for Arabic language learners.

Table 4: Accuracy of Context Understanding

No.	Items	Mean Score	Interpretation
1	Generative AI supports understanding of cultural contexts in Arabic.	5.07	High
2	Generative AI accurately distinguishes meanings in various contexts.	5.09	High
3	Generative AI clarifies the meanings of Arabic metaphors.	5.09	High
4	Generative AI enhances comprehension of social contexts in Arabic.	5.11	High
5	Generative AI provides accurate explanations of polysemous Arabic words.	4.88	Moderate
6	Generative AI assists in differentiating between formal and informal Arabic.	4.82	Moderate
7	Generative AI simplifies understanding historical or cultural contexts in texts.	5.05	High
8	Generative AI aids in understanding regional Arabic variations.	4.97	Moderate
9	Generative AI accurately explains background information of texts.	4.90	Moderate
10	Generative AI helps uncover implied meanings in Arabic conversations.	5.00	High

Table 4 presents the effectiveness of generative AI in enhancing the accuracy of context understanding in Arabic language learning. High scores were observed in areas such as supporting cultural context comprehension (5.07), distinguishing meanings in various contexts (5.09), clarifying metaphors (5.09), and

enhancing social context understanding (5.11). Additionally, the AI performed well in simplifying historical and cultural contexts (5.05) and uncovering implied meanings in conversations (5.00).

However, moderate scores were recorded for providing accurate explanations of polysemous words (4.88), differentiating between formal and informal Arabic (4.82), aiding in understanding regional Arabic variations

(4.97), and explaining background information in texts (4.90). These findings indicate that while generative AI excels in general cultural and contextual comprehension, there are challenges in addressing more nuanced linguistic and regional variations. These insights suggest the need for further development of AI tools to better support complex language features and regional diversity in Arabic.

Table 5: Learning Adaptability and Collaboration

No.	Items	Mean Score	Interpretation
1	Generative AI adjusts learning content to match proficiency levels.	4.96	Moderate
2	Generative AI offers personalized learning recommendations.	5.10	High
3	Generative AI offers personalized learning recommendations.	5.00	High
4	Generative AI supports collaborative learning with classmates.	5.02	High
5	Generative AI adapts to individual learning styles.	5.08	High
6	Generative AI aligns exercises with personal learning goals.	5.12	High
7	Generative AI customizes assignments based on skill level.	5.07	High
8	Generative AI promotes teamwork in Arabic projects.	4.92	Moderate
9	Generative AI facilitates interaction with instructors or tutors.	4.85	Moderate
10	Generative AI supports both individual and collaborative learning modes.	5.09	High

Table 5 evaluates generative AI's role in enhancing learning adaptability and collaboration in Arabic language education. High scores were observed in areas such as providing personalized learning recommendations (5.10), adapting to individual learning styles (5.08), aligning exercises with personal learning goals (5.12), and supporting collaborative learning with classmates (5.02). Additionally, the AI was effective in customizing assignments based on skill level (5.07) and supporting both individual and collaborative learning modes (5.09).

However, moderate scores were noted in adjusting content to match proficiency levels (4.96), promoting teamwork in Arabic projects (4.92), and facilitating interaction with instructors or tutors (4.85). These findings suggest that while generative AI effectively personalizes and adapts to individual learning needs, its potential for fostering deeper collaboration and instructor interactions requires further improvement. Overall, generative AI demonstrates strong adaptability for personalized learning but could be enhanced to better support collaborative learning dynamics.

Table 6: User Acceptance and Satisfaction

No.	Items	Mean Score	Interpretation
1	I am satisfied with my Generative AI-based Arabic learning experience.	5.14	High
2	Generative AI meets expectations for Arabic language learning.	5.02	High
3	Generative AI is comfortable to use in daily learning activities.	5.22	High
4	Users are likely to recommend Generative AI for Arabic learning.	5.13	High
5	The Generative AI interface is user-friendly.	5.25	High
6	Learning outcomes with Generative AI align with expectations.	5.05	High
7	Generative AI features meet specific learning needs.	5.07	High
8	Generative AI offers valuable benefits in Arabic learning.	5.23	High
9	Generative AI is accessible whenever needed.	5.21	High
10	The Generative AI interface effectively supports the learning process.	5.25	High

Table 6 illustrates user acceptance and satisfaction regarding generative AI in Arabic language learning. The data reveal consistently high scores across all metrics. Students reported being satisfied with their AI-based learning experience (5.14) and found the AI tools comfortable for daily use (5.22). They rated the interface as user-friendly (5.25) and appreciated its alignment with learning expectations (5.05). The tools were also recognized for their ability to meet specific learning needs (5.07), offer valuable benefits (5.23), and remain accessible when

needed (5.21).

Additionally, users expressed a high likelihood of recommending these tools for Arabic learning (5.13). The AI effectively supported the learning process (5.25), further emphasizing its utility in educational contexts. These findings suggest that generative AI tools are well-received by learners, offering user-friendly interfaces and meaningful benefits that align with their educational needs and expectations, thus demonstrating significant potential for widespread adoption in Arabic language education.

Table 7: Comparison between IIUM and UIN Syarif Hidayatullah Jakarta

Comparison between Items	IIUM (Mean Score)	Interpretation	UIN Jakarta (Mean Score)	Interpretation
Learning Effectiveness	5.12	High	4.07	Moderate
Student Engagement	5.18	High	3.98	Moderate
Accuracy of Context Understanding	5.00	High	4.04	Moderate
Learning Adaptability and Collaboration	5.02	High	4.16	Moderate
User Acceptance and Satisfaction	5.16	High	4.13	Moderate

The table 7 compares the perceptions of students at the International Islamic University Malaysia (IIUM) and Universitas Islam Negeri Syarif Hidayatullah Jakarta (UIN) regarding the effectiveness of generative AI tools in Arabic language education. The comparison spans five key dimensions: learning effectiveness, student engagement, accuracy of context understanding, learning adaptability and collaboration, and user acceptance and satisfaction.

Across all dimensions, IIUM students reported higher mean scores, consistently rated as “High.” For instance, learning effectiveness scored 5.12 at IIUM compared to 4.07 at UIN, while student engagement was rated 5.18 at IIUM versus 3.98 at UIN. Similarly, the accuracy of context understanding received a mean score of 5.00 at IIUM, in contrast to 4.04 at UIN. Learning adaptability and collaboration, as well as user acceptance and satisfaction, also displayed higher ratings at IIUM (5.02 and 5.16, respectively) than at UIN (4.16 and 4.13, respectively), where they were rated as “Moderate.” These differences may reflect variations in institutional resources, pedagogical strategies, and students' familiarity with or access to generative AI technologies. The findings suggest that IIUM students perceive AI tools as more impactful across the evaluated dimensions compared to their counterparts at UIN, indicating a need for targeted improvements in the implementation and support of such technologies at UIN.

DISCUSSION

The findings from the analysis underscore the significant role of generative AI in Arabic language education, particularly in enhancing key learning domains such as vocabulary acquisition, grammar comprehension, and reading proficiency. High performance in these areas reflects the AI's ability to address foundational linguistic needs effectively. Additionally, its support for writing skills, pronunciation, and understanding complex materials highlights its potential as a versatile educational tool. However, moderate performance in providing nuanced feedback and mastering idiomatic expressions points to areas requiring further refinement, particularly to support learners in acquiring cultural and contextual subtleties in Arabic.

Generative AI also demonstrates strong capabilities in fostering student engagement, as evidenced by high ratings for making learning sessions dynamic, increasing motivation, and simplifying material access. The ability to encourage perseverance and active participation further emphasizes its value in creating an interactive and motivating learning environment. Despite these strengths, challenges such as maintaining focus and enhancing collaboration highlight the need for targeted improvements. Addressing these aspects, along with enhancing its adaptability to diverse learning contexts and instructor interaction, will enable generative AI to provide a more holistic and effective learning experience for Arabic language learners.

Despite its benefits, generative AI may struggle with accurately understanding the cultural and contextual nuances of the Arabic language, potentially leading to inaccuracies in translations or interpretations.

CONCLUSION

The findings of this study conclude that generative AI demonstrates significant potential in enhancing Arabic language learning across multiple dimensions. High scores in areas such as vocabulary acquisition, grammar comprehension, and reading proficiency affirm the AI's effectiveness in core linguistic domains. Moreover, its ability to support writing development, pronunciation practice, and understanding complex materials positions it as a valuable educational tool. Generative AI also excels in fostering student engagement by making learning more interactive, motivational, and accessible. However, the moderate performance in areas such as providing nuanced feedback, mastering idiomatic expressions, and promoting collaboration suggests that further refinements are needed to address these critical aspects of language acquisition.

Furthermore, the comparative analysis between students at IIUM and UIN reveals a disparity in perceptions of AI's effectiveness, highlighting the importance of institutional resources and pedagogical strategies in maximizing its impact. IIUM students consistently rated AI tools higher across all dimensions, suggesting more effective integration and access. In contrast, UIN students reported moderate scores, indicating a need for improved implementation and support. These insights emphasize the necessity of targeted strategies to enhance AI adoption and effectiveness, particularly in institutions with limited resources. Overall, generative AI emerges as a transformative tool with the capacity to revolutionize Arabic language education, provided its limitations are addressed and its integration is tailored to diverse educational contexts. Future research should focus on improving AI’s cultural and linguistic sensitivity by integrating region-specific language models and collaborating with native Arabic educators to ensure more accurate and context-aware AI-generated content.

ACKNOWLEDGEMENT

This research was supported by Institute for Research and Community Empowerment (LP2M), Jakarta, Indonesia. The authors sincerely thank LP2M at UIN Syarif Hidayatullah, Jakarta for their generous financial support under the grant number B663/LP2M/HK.01.1/10/2024. Their contribution has been instrumental in enabling the successful completion of this study. The views expressed in this article are solely those of the authors and do not necessarily represent the views of at UIN Syarif Hidayatullah, Jakarta, Indonesia.

Achievement

This research was also recognized for its excellence by winning the Bronze Medal at the Global Arabic Islamic Annual Festival (GARIFF) 2024, held at the International Islamic University Malaysia (IIUM) in December 2024. This accolade highlights the study's innovative contribution to the field of Arabic language education and underscores its impact within the academic and cultural community. The award further emphasizes the potential of integrating generative AI technology to enhance Arabic language learning and teaching methodologies on a global scale.

REFERENCES

1. Abu-Rabia, S., Kedan, E. S., & Wattad, H. (2022). The influence of diglossia on syntactic proficiency in modern standard arabic among regular and struggling readers. Creative Education, 13(01), 252–282. https://doi.org/10.4236/ce.2022.131016

2. Al-Moghrabi, K. G., & Al-Ghonmein, A. M. (2024). The role of chat generative pre-trained transformer in facilitating decision-making and the e-learning process in higher education. Bulletin of Electrical Engineering and Informatics, 13(3), 2058–2066. https://doi.org/10.11591/eei.v13i3.7237
3. Alsubayhay, A. M. S., Salam, M. S. H., & Mohamed, F. B. (2022). A review on approaches in arabic chatbot for open and closed domain dialog. International Journal of Advanced Computer Science and Applications, 13(11), 158-167. https://doi.org/10.14569/IJACSA.2022.0131117
4. Du, J., & Daniel, B. K. (2024). Transforming language education: A systematic review of AI-powered chatbots for English as a foreign language speaking practice. Computers and Education: Artificial Intelligence, 6, 1-12. https://doi.org/10.1016/j.caeai.2024.100230
5. Ellis, R., & Shintani, N. (2014). Exploring Language Pedagogy through Second Language Acquisition Research. Routledge.
6. Guingrich, R. E., & Graziano, M. S. A. (2024). Ascribing consciousness to artificial intelligence: Human-AI interaction and its carry-over effects on human-human interaction. Frontiers in Psychology, 15, 1-13. https://doi.org/10.3389/fpsyg.2024.1322781
7. Huang, W., Hew, K. F., & Fryer, L. K. (2022). Chatbots for language learning—Are they really useful? A systematic review of chatbot-supported language learning. Journal of Computer Assisted Learning, 38(1), 237–257. https://doi.org/10.1111/jcal.12610
8. Husain, A., & Housni, H. E. (2024). Large language model-powered chatbots for internationalizing student support in higher education. Link: https://arxiv.org/abs/2403.14702.
9. Kearney, E. (2016). Intercultural learning in modern language education: Expanding meaning-making potentials. Bristol, Blue Ridge Summit: Multilingual Matters. https://doi.org/10.21832/9781783094684
10. Kim, Y., & Baylor, A. L. (2007). Pedagogical agents as social models to influence learner attitudes. Educational Technology, 47(01), 23-28.
11. Kim, N.Y., Kim, H.S., & Cha, Y.J. (2019). Future English Learning: Chatbots and Artificial Intelligence. Multimedia-Assisted Language Learning, 22(3), 32–53. https://doi.org/10.15702/MALL.2019.22.3.32
12. Kuhail, M. A., Alturki, N., Alramlawi, S., & Alhejori, K. (2023). Interacting with educational chatbots: A systematic review. Education and Information Technologies, 28(1), 973–1018. https://doi.org/10.1007/s10639-022-11177-3
13. Mageira, K., Pittou, D., Papasalouros, A., Kotis, K., Zangogianni, P., & Daradoumis, A. (2022). Educational AI Chatbots for Content and Language Integrated Learning. Applied Sciences, 12(7), 3239, 1-16. https://doi.org/10.3390/app12073239
14. Nely Rahmawati, Z., Eko Budi, H., & Fatchiatu, Z. (2023). acceptability and effectiveness analysis of large language model-based artificial intelligence chatbot among Arabic learners. Mantiq al-Tayr: Journal of Arabic Language, 4(1), 1–20. https://doi.org/10.25217/mantiqutayr.v4i1.3951
15. Nguyen, T. (2015). The effectiveness of online learning: beyond no significant difference and future horizons. MERLOT Journal of Online Learning and Teaching, 11, 309-319. Link: https://jolt.merlot.org/Vol11no2/Nguyen_0615.pdf
16. Nizzolino, S. (2024). Artificial intelligence in language teaching: Using ChatGPT to assist teachers of English as a foreign language. Form@re - Open Journal per La Formazione in Rete, 24(1), 242–261. https://doi.org/10.36253/form-15681
17. Ramesh, M., Jayashree, R. (2024). Adaptive e-learning environments: A methodological approach to identifying and integrating multi-layered learning styles. SN COMPUT. SCI. 5, 772. https://doi.org/10.1007/s42979-024-03114-7
18. Ouali, S., & Said, E. G. (2024). Arabic chatbots challenges and solutions: A systematic literature review. Iraqi Journal For Computer Science and Mathematics, 5(3), 128–169. https://doi.org/10.52866/ijcsm.2024.05.03.007
19. Oxford, R. L., Lavine, R., & Amerstorfer, C. M. (2018). Understanding language learning strategies in context: An innovative, complexity-based approach. In R. L. Oxford & C. M. Amerstorfer (Eds.), Language Learning Strategies and Individual Learner Characteristics: Situating Strategy Use in Diverse Contexts (pp. 5–29). London: Bloomsbury.
20. Petrović, J., & Jovanović, M. (2021). The role of chatbots in foreign language learning: the present situation and the future outlook. In E. Pap (Ed.), Artificial Intelligence: Theory and Applications (Vol. 973, pp. 313–330). Springer International Publishing. https://doi.org/10.1007/978-3-030-72711-6_17

21. Singh, P., & Doherty, C. (2004). Global cultural flows and pedagogic dilemmas: Teaching in the global university contact zone. TESOL Quarterly, 38(1), 9. https://doi.org/10.2307/3588257
22. Soliman, R., & Khalil, S. (2022). The teaching of Arabic as a community language in the UK. International Journal of Bilingual Education and Bilingualism, Vol. 27, No. 9, 1246–1257. https://doi.org/10.1080/13670050.2022.2063686
23. Zainuddin, N., Nur Azlin, S., Mohammad Najib, J., Norita M.N., Muhammad Sabri, S., Wan Ab Aziz, W.D., & Mohammad Taufiq, A.G. (2024). Responsible and ethical use of artificial intelligence in language education: A systematic review. Forum for Linguistic Studies, 6(5), 316–325. https://doi.org/10.30564/fls.v6i5.7092
24. Zhang, Z., & Huang, X. (2024). The impact of chatbots based on large language models on second language vocabulary acquisition. Heliyon, 10(3), e25370. https://doi.org/10.1016/j.heliyon.2024.e25370
25. Wang, T., Lund, B. D., Marengo, A., Pagano, A., Mannuru, N. R., Teel, Z. A., & Pange, J. (2023). Exploring the Potential Impact of Artificial Intelligence (AI) on International Students in Higher Education: Generative AI, Chatbots, Analytics, and International Student Success. Applied Sciences, 13(11), 6716. https://doi.org/10.3390/app13116716