AL-IRFAN: Journal of Arabic Literature and Islamic Studies
P-ISSN: 2622-9897 E-ISSN: 2622-9838

Vol. 9, No. 1, 2026, 415-438
DOI: https://doi.org/10.58223/al-irfan.v9i1.729

The Use of Artificial Intelligence-Based Generative Learning Media to Improve Arabic Language Learning Strategies

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Keywords:
Generative AI; Chatbot AI; ChatGPT; learning strategies; Arabic language learning

Abstract

The rapid development of generative Artificial Intelligence (AI) has created new opportunities for interactive and adaptive learning media in Arabic language education. Tools such as ChatGPT and Chatbot AI enable dialogic interaction, immediate feedback, and personalized learning experiences that support students in practicing language skills and accessing learning resources. However, existing studies on generative AI in Arabic language learning often focus primarily on learning outcomes, while the role of these technologies in supporting students' learning strategies has received limited systematic attention. This study aims to systematically examine the forms and pedagogical characteristics of generative AI-based learning media, analyze their association with the development of students' learning strategies, and identify pedagogical and contextual challenges in implementation. This research employs a qualitative Systematic Literature Review (SLR) method guided by the PRISMA framework, with interpretation supported by the Technology Acceptance Model (TAM). Fifteen studies published between 2021 and 2025 were selected from Google Scholar and Crossref databases based on predefined

inclusion and exclusion criteria. The findings indicate that ChatGPT and Chatbot AI are widely used to support speaking, writing, translation practice, adaptive feedback, and independent learning in Arabic language learning. These technologies function as external scaffolds that facilitate learning planning, resource management, and learning process monitoring. The study concludes that generative AI has significant potential to support strategic learning development in Arabic language education, although its implementation still faces challenges related to linguistic accuracy, ethical considerations, and disparities in digital literacy and technological infrastructure.

Abstrak

Kata Kunci:
AI Generatif;
Chatbot AI;
ChatGPT;
strategi belajar;
pembelajaran Bahasa Arab

Perkembangan pesat generative Artificial Intelligence (AI) telah membuka peluang baru bagi pengembangan media pembelajaran yang interaktif dan adaptif dalam pembelajaran bahasa Arab. Perangkat seperti ChatGPT dan Chatbot AI memungkinkan interaksi dialogis, pemberian umpan balik secara langsung, serta pengalaman belajar yang dipersonalisasi sehingga membantu siswa dalam berlatih keterampilan bahasa dan mengakses berbagai sumber belajar. Namun, penelitian mengenai penggunaan generative AI dalam pembelajaran bahasa Arab masih lebih banyak berfokus pada hasil belajar, sementara peran teknologi tersebut dalam mendukung strategi belajar siswa belum banyak dikaji secara sistematis. Penelitian ini bertujuan untuk secara sistematis mengkaji bentuk dan karakteristik pedagogis media pembelajaran berbasis generative AI, menganalisis keterkaitannya dengan pengembangan strategi belajar siswa, serta mengidentifikasi tantangan pedagogis dan kontekstual dalam implementasinya. Penelitian ini menggunakan metode Systematic Literature Review (SLR) yang dipandu oleh kerangka PRISMA, dengan interpretasi analisis yang didukung oleh Technology Acceptance Model (TAM). Sebanyak lima belas artikel yang dipublikasikan antara tahun 2021 hingga 2025 dipilih dari basis data Google Scholar dan Crossref berdasarkan kriteria inklusi dan eksklusi yang telah ditetapkan. Hasil penelitian menunjukkan bahwa ChatGPT dan Chatbot AI banyak digunakan untuk mendukung latihan berbicara, menulis, penerjemahan, pemberian umpan balik adaptif, serta pembelajaran mandiri dalam pembelajaran bahasa Arab. Teknologi ini berfungsi sebagai scaffolding eksternal yang mendukung perencanaan belajar, pengelolaan sumber belajar, dan pemantauan proses belajar. Penelitian ini menyimpulkan bahwa generative AI memiliki potensi yang signifikan dalam mendukung pengembangan strategi belajar dalam pembelajaran bahasa Arab, meskipun implementasinya masih menghadapi tantangan terkait akurasi linguistik, pertimbangan etis, serta kesenjangan literasi digital dan infrastruktur teknologi.

Received: 06-02-2026, Revised: 19-02-2026, Accepted: 31-03-2026

Introduction

The rapid development of Artificial Intelligence (AI) in education has led to generative learning media capable of producing interactive and adaptive instructional content (Fitri, 2025). Concurrently, students are expected to master 21st-century competencies encompassing cognitive, affective, and social dimensions (Mashudi, 2021). Conventional teacher-centered approaches often fall short in meeting these demands, highlighting the need for adaptive, learner-centered media to enhance engagement and learning outcomes. AI-based tools such as ChatGPT and Chatbot AI enable real-time, dialogic interaction and are applied in Arabic language learning for vocabulary practice, conversational simulation, grammatical correction, translation, and immediate feedback (Sari et al., 2025). Their adaptive features make generative AI a promising medium for flexible, independent, and personalized learning.

However, integrating generative AI in education goes beyond technological innovation. Modern learning emphasizes students' ability to regulate and manage their own learning. Learning strategies involve deliberate actions to plan, organize resources, and monitor progress (Andilah et al., 2025), encompassing cognitive processing, metacognitive awareness, and affective regulation essential for autonomous learning. Thus, the use of instructional media, including generative AI, should be evaluated based on its impact on students' learning strategies rather than mere content delivery.

In Arabic language learning, strategic regulation is crucial due to the linguistic complexity of phonology, morphology, syntax, and semantics, alongside the integration of four core skills: listening (istimā'), speaking (kalām), reading (qirā'ah), and writing (kitābah) (Yasin et al., 2023). These demands require structured practice, continuous feedback, and sustained metacognitive engagement. AI-based generative media offer learners opportunities to plan study activities, use digital resources effectively, and monitor progress through instant feedback (Yasmar et al., 2023). Nevertheless, their pedagogical value

depends on strategic integration into instructional design and learner self-regulation.

Meanwhile, several prior studies have examined the effectiveness, potential, and limitations of generative AI across diverse instructional contexts. A key study, "Enhancing Students' Writing Skills through ChatGPT in Maharah Kitabah" by (Amir, 2023), reported significant improvement in students' writing performance. Similar positive outcomes were documented by (Jalaludin & Naseha, 2025), who found enhanced writing achievement and increased speaking fluency (*maharah kalām*) through classroom-based interventions. Gains in creative writing were also demonstrated by (Yasmar et al., 2023), while (Sari et al., 2025) identified improvements in both *kalām* and *kitābah* at the Islamic senior high school level. From a translation perspective, (Latifah & Djamilah, 2024) and (Faris & Abdurrahman, 2023) showed relatively strong semantic and contextual performance, although limitations emerged in handling complex structures. (Kılıçkaya & Kic-Drgas, 2025) further confirmed the effectiveness of Large Language Models (LLMs) in providing generative feedback, yet highlighted dialectal bias toward non-standard Arabic. Despite these generally positive findings, most studies were conducted over short durations, involved limited sample sizes, or lacked longitudinal measurement. In addition, translation assessments frequently relied on subjective evaluation, and several interventions were restricted to specific educational levels, thereby limiting broader generalizability.

Second, from the perspective of learning strategies and self-regulated learning, AI has been widely discussed as a catalyst for learner autonomy. A central study, "Strategies for Using Artificial Intelligence Chatbots in Arabic Language Learning at Indonesian Higher Education Institutions" by (Ramadhan, 2023), found that Chatbot AI supports independent practice and digital resource management. Similarly, (Izzati et al., 2025) demonstrated that ChatGPT facilitates learning planning and monitoring processes aligned with self-regulated learning theory. Using a mixed-method approach, (Doohee, 2024) reported increased

engagement and more adaptive learning environments following AI integration. These findings are conceptually reinforced by (Samiya, 2025), who emphasized personalization and intelligent tutoring systems, and (Mohideen, 2024), who highlighted efficiency and automated evaluation in a literature review. However, methodological contrasts are evident: case studies and qualitative designs lack control comparisons, conceptual analyses remain empirically untested, and review studies rely solely on secondary data. Thus, although AI shows potential in strengthening learning strategies, the robustness and sustainability of empirical evidence remain uneven, particularly regarding long-term self-regulated learning development.

Third, several studies foreground ethical, contextual, and pedagogical challenges that complicate the optimistic narrative surrounding generative AI. A prominent study, "Impacts and Challenges of ChatGPT Integration in the Merdeka Curriculum: A Systematic Literature Review" by (Supriyono et al., 2024), identified increased student motivation alongside risks of plagiarism and academic integrity violations within the Merdeka Curriculum context. Similar concerns were reported by (Alkaabi & Almaamari, 2025), who found extensive use of generative AI for material development and assessment, yet highlighted issues of dialectal accuracy and academic integrity. (Latifah & Djamilah, 2024) further noted contextual linguistic inaccuracies in translation, reinforcing concerns about overreliance on automated outputs. While these qualitative investigations underscore ethical vulnerability and dependency risks, they remain largely perception-based and lack quantitative validation of student performance. Moreover, the concentration of studies within specific institutional or national contexts limits cross-cultural comparison and introduces contextual bias related to curriculum structure, digital literacy, and regulatory frameworks.

Based on a systematic mapping of prior studies, research on generative Artificial Intelligence in Arabic language learning remains fragmented. While many studies report positive outcomes in writing, speaking, translation, and learner engagement, discussions are mostly descriptive and lack systematic

comparison across methodologies and contexts. Experimental studies focus on short-term performance gains, whereas qualitative research highlights ethical and contextual issues, yet these perspectives are seldom integrated analytically. Learning strategies are often treated as secondary findings rather than central outcomes. Consequently, few studies explicitly examine how generative AI supports the development of students' learning strategies, highlighting the need for rigorous research that links technological use with strategic learning development.

Based on the identified research gap, this study aims to systematically examine the forms and characteristics of generative AI-based learning media, particularly ChatGPT and Chatbot AI, in Arabic language education; to analyze how their use is associated with the development of students' learning strategies as reported in prior studies; and to identify the pedagogical and contextual challenges surrounding their implementation. To guide the analysis, this study addresses three main research questions: what forms of generative AI-based learning media, particularly ChatGPT and Chatbot AI, are used in Arabic language learning; how the use of these AI-based learning media is associated with the development of students' learning strategies; and what pedagogical and contextual challenges are reported in the implementation of generative AI tools in Arabic language learning. To provide a theoretical perspective, this study adopts the Technology Acceptance Model (TAM) (Davis, 1989), which explains technology acceptance through perceived usefulness and perceived ease of use (Venkatesh et al., 2003). Methodologically, a Systematic Literature Review (SLR) guided by the PRISMA framework (Page et al., 2021) was employed to ensure a structured and transparent synthesis of existing research.

Method

This study adopts a qualitative approach by employing the Systematic Literature Review (SLR) method to comprehensively examine the use of generative Artificial Intelligence (AI)-based learning media, particularly

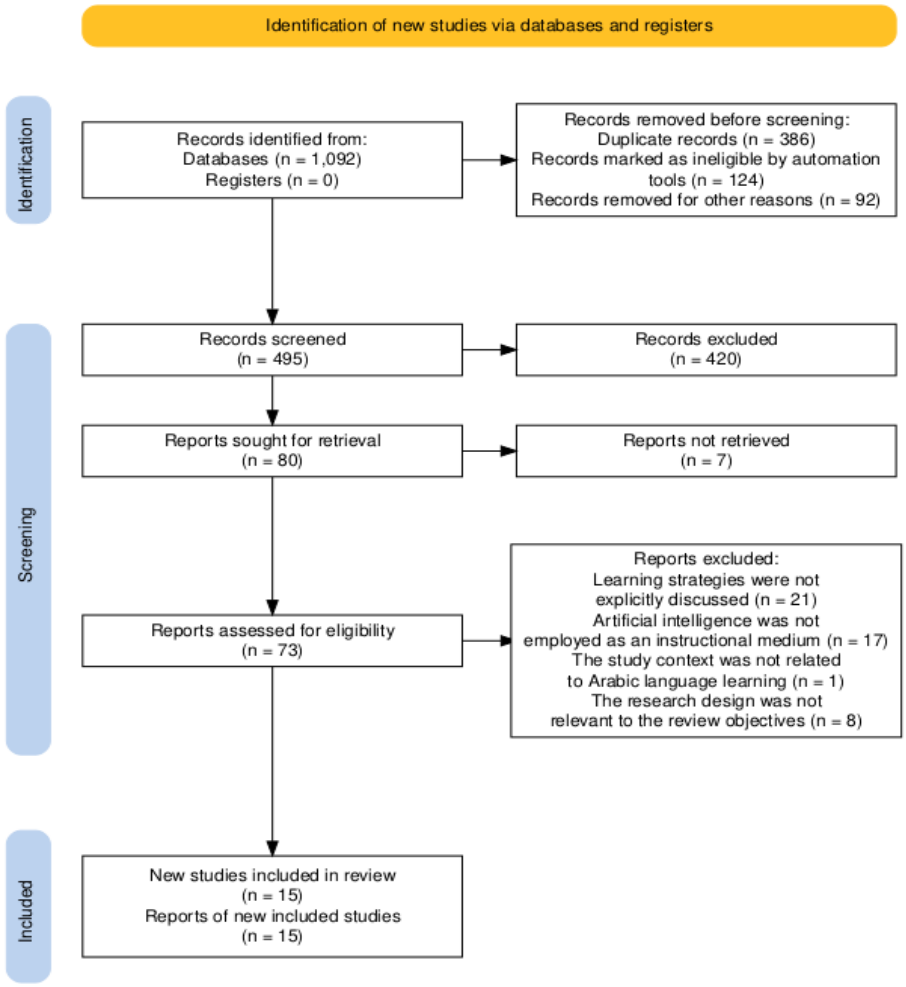
ChatGPT and Chatbot AI, in Arabic language learning and their relationship with students' learning strategies. The SLR approach was selected because it enables a systematic, critical, and evidence-based synthesis of research in fields that are dynamically evolving and multidisciplinary in nature (Kitchenham et al., 2009).

To ensure methodological rigor, this study employs the Systematic Literature Review (SLR) method using planned, transparent, and systematic procedures (Thomas & Harden, 2008). SLR enables researchers to critically identify, select, and synthesize prior findings, providing both descriptive summaries and deeper analytical insights (Kitchenham & Brereton, 2013). This method is widely used in education and learning technology research for mapping trends, gaps, and future directions (Xiao & Watson, 2019). In Arabic language learning, SLR is particularly suitable for examining generative AI integration, which remains novel and underexplored empirically (Supriyanto & Toifah, 2024).

In addition, this study follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework as recommended by (Page et al., 2021). The framework ensures that all stages of the review process, including literature identification, screening, eligibility assessment, and synthesis, are conducted systematically, transparently, and consistently.

Result and Discussion

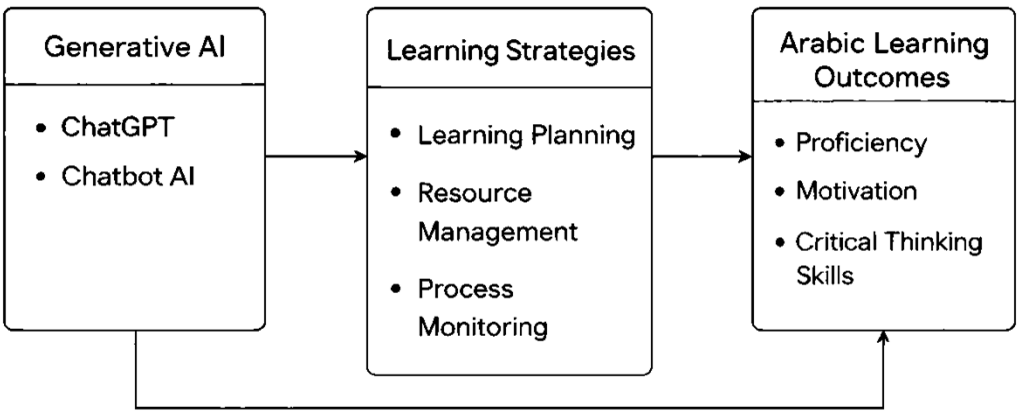
The article selection process is presented using the PRISMA 2020 flow diagram, which systematically shows the number of records identified, screened, assessed for eligibility, and included in the review. This structured reporting enhances transparency and methodological rigor. The PRISMA diagram for this study is presented below:



The data extraction results show that fifteen articles met the inclusion criteria. These studies consistently report the use of generative AI, particularly ChatGPT and AI-based chatbots, as instructional media supporting the development of students' learning strategies in Arabic language education. Findings indicate that generative AI facilitates learning planning, resource management, and process monitoring across diverse educational contexts. The Data presents a synthesis of the key findings from fifteen selected studies examining the use of generative artificial intelligence in Arabic language learning, with particular emphasis on its impact on students' learning strategies.

Thi study proposes a conceptual framework illustrating the relationship between generative AI and Arabic language learning strategies. The framework demonstrates how tools such as ChatGPT and Chatbot AI support learning

planning, resource management, and learning process monitoring, which subsequently contribute to broader learning outcomes. The proposed conceptual framework is presented in the following figure:



The conceptual framework positions generative AI, such as ChatGPT and Chatbot AI, as a strategic enabler in Arabic language learning, influencing outcomes primarily through students' learning strategies. These tools support self-regulated learning, including planning, resource management, and process monitoring, which enhance proficiency, motivation, and critical thinking. The model emphasizes that sustainable educational outcomes depend on how effectively AI strengthens strategic learning within pedagogical contexts.

Effectiveness also depends on contextual factors such as teacher mediation, institutional readiness, digital literacy, and ethical governance. Without deliberate instructional integration and responsible guidance, AI may improve efficiency but not foster deep cognitive engagement or long-term strategy development. This framework provides a foundation for empirical study and practical application, highlighting how AI can support meaningful and sustainable learning in Arabic language education.

Implementation Forms and Pedagogical Characteristics of Generative AI in Arabic Language Education

Generative AI-based learning media are intelligent systems that produce instructional content, adaptive feedback, dialogic responses, and evaluative

outputs tailored to learner input (Simon, 2023). In Arabic language learning, these systems are primarily implemented through ChatGPT, AI-based chatbots, large language models (LLMs), and AI-supported adaptive platforms. A synthesis of fifteen selected studies shows that generative AI is applied across curriculum integration, speaking and writing instruction, translation practice, adaptive learning systems, and AI-assisted assessment. However, considerable variation in methodological rigor, contextual implementation, and evidentiary strength suggests that its pedagogical impact cannot be generalized without caution.

At the curriculum and institutional level, ChatGPT integration within the Merdeka Curriculum has been reported to increase student motivation while raising risks of plagiarism and academic integrity violations (Supriyono et al., 2024). (Samiya, 2025) highlights the potential of AI for personalization and intelligent tutoring systems in Arabic education, although the study is conceptual and lacks empirical validation. (Mohideen, 2024) argues that AI integration improves efficiency and automated evaluation, but reliance on secondary data limits contextual depth. A mixed-methods study by (Doohee, 2024) finds that AI enhances engagement and adaptive learning, yet the absence of longitudinal measurement constrains conclusions about sustained effectiveness. (Kılıçkaya & Kic-Drgas, 2025) demonstrate the effectiveness of Large Language Models for generative feedback and task support, but also identify dialectal bias toward non-standard Arabic varieties. From an instructional perspective, (Alkaabi & Almaamari, 2025) show that instructors use generative AI for material development, assessment, and personalization, though the study relies solely on instructor interviews without quantitative student outcome data. Collectively, these studies indicate that generative AI offers promising institutional opportunities, but ethical governance and dialectal representation remain critical concerns.

In skill-based instruction, generative AI shows differentiated applications. In speaking, (Nasruddin, 2025) reports increased fluency and self-confidence

through Classroom Action Research, though the small sample limits generalizability. Similarly, (Sari et al., 2025) note improvements in speaking (*kalam*) and writing (*kitabah*) in Islamic Senior High School contexts, but qualitative design and single-level focus constrain broader applicability. In writing, (Amir, 2023) provides experimental evidence of significant performance gains after AI-assisted practice, though short intervention duration prevents long-term evaluation(Jalaludin & Naseha, 2025) demonstrate significant gains using Chatbot AI, but potential assessment bias must be considered. (Yasmar et al., 2023) find that ChatGPT enhances creativity and writing fluency within a 6C framework, yet lack of longitudinal tracking raises questions about durability. Overall, experimental studies report measurable improvements, while qualitative studies emphasize engagement and perception, suggesting possible optimism bias in self-reported outcomes.

In independent and translation learning contexts, generative AI is associated with enhanced self-regulated learning strategies and task efficiency. (Izzati et al., 2025) show that ChatGPT supports learning planning and process monitoring in autonomous settings, though the case study design limits external validity. (Ramadhan, 2023) reports improved independent practice, but lack of control comparisons (Latifah & Djamilah, 2024). In translation, (Latifah & Djamilah, 2024) find ChatGPT produces rapid and relatively accurate translations, while (Faris & Abdurrahman, 2023) note strong semantic performance; however, complex texts still require human validation, and classroom testing is limited. These findings indicate that AI may function as a strategic scaffold for self-directed learning and translation tasks, yet pedagogical risks remain. Overreliance on AI-generated output can reduce deep syntactic processing and analytical reasoning, especially if learners accept translations uncritically. Additionally, dialectal bias (Kılıçkaya & Kic-Drgas, 2025) and academic integrity concerns (Supriyono et al., 2024) highlight broader ethical implications.

From a theoretical perspective, the Technology Acceptance Model (Davis, 1989) helps interpret patterns across the fifteen studies. (Amir, 2023) and Nasruddin (2025) reflect perceived usefulness through improved performance and immediate feedback, while (Ramadhan, 2023) and (Izzati et al., 2025) illustrate perceived ease of use via conversational interfaces and accessibility. However, most studies rely on perception-based evidence rather than longitudinal data, indicating that positive acceptance does not necessarily translate into sustained language acquisition. In this Systematic Literature Review, TAM is employed conceptually to map acceptance trends rather than to provide direct causal validation (Venkatesh et al., 2003).

The synthesis of all fifteen studies indicates a structured relationship between generative AI use and the enhancement of student learning strategies. AI tools support learning planning by helping learners organize goals and materials (Izzati et al., 2025). They also support learning planning according to (Alkaabi & Almaamari, 2025). They facilitate resource management through accessible linguistic input and translation alternatives (Ramadhan, 2023). Resource management is further supported according to (Faris & Abdurrahman, 2023). They strengthen process monitoring via immediate feedback and revision cycles (Amir, 2023). Process monitoring is also emphasized by (Jalaludin & Naseha, 2025). Generative AI thus functions not as a direct determinant of learning outcomes but as an external scaffold that amplifies internal strategic regulation. This relational dynamic forms nologies functionthe conceptual basis for a visual framework illustrating how AI-supported learning strategies mediate improvements in Arabic language proficiency.

Overall, the expanded synthesis of fifteen studies broadens the analytical scope compared to earlier reviews limited to ten articles. However, methodological constraints, regional concentration, short-term interventions, and limited cross-cultural comparison highlight the need for more rigorous empirical research. Generative AI holds considerable pedagogical potential in Arabic language learning, but its effectiveness depends on structured

instructional integration, ethical safeguards, dialect-sensitive implementation, and the development of critical digital literacy.

The Association Between Generative AI Use and the Development of Students' Learning Strategies

Learning strategies are systematic actions learners employ to process, understand, retain, and apply information effectively to achieve instructional goals. These strategies include cognitive and metacognitive dimensions, such as selecting appropriate techniques, managing time, regulating the learning environment, and strategically using learning media (Andilah et al., 2025). In Arabic language learning, where mastery requires consistent practice, reflective engagement, and self-regulation, learning strategies serve as a key mechanism through which generative AI use can influence students' language acquisition outcomes (Yasin et al., 2023).

In this study, improvement in learning strategies is conceptualized as the development of learners' capacity to plan, manage, and monitor their Arabic learning processes more consciously and systematically (Andilah et al., 2025). AI-based generative learning media provide structured scaffolding at the planning stage. For instance, (Supriyono et al., 2024) report that students use ChatGPT to determine learning focus and sequence practice tasks within the Merdeka Curriculum framework. Similarly, (Amir, 2023) shows ChatGPT supports organizing writing preparation and idea generation, while (Izzati et al., 2025) find generative AI facilitates flexible goal setting and rhythm regulation in independent learning. These studies indicate that AI use can enhance metacognitive planning strategies, but reliance on perception-based or short-term designs limits conclusions about sustained strategic development. Moreover, risks of superficial engagement and potential misuse suggest that strategic gains may coexist with ethical vulnerabilities.

Beyond planning, generative AI supports learning resource management strategies. (Ramadhan, 2023) reports that Chatbot AI enables independent access

to materials and exercises, strengthening learners' autonomy in selecting relevant input. (Jalaludin & Naseha, 2025) find that AI systems adapt instructional materials to learners' ability levels, promoting personalized resource use, while (Yasmar et al., 2023) show that AI-assisted writing environments encourage exploration of alternative vocabulary and structures. Cross-study comparison indicates that although adaptive personalization increases efficiency, it may reduce productive struggle, which is critical for deeper cognitive processing. Additionally, experimental studies (Jalaludin & Naseha, 2025) demonstrate statistically significant gains, whereas qualitative studies (Ramadhan, 2023) focus on perceived usefulness rather than sustained strategy retention, highlighting the need for cautious interpretation.

The monitoring and evaluation dimension of learning strategies is where generative AI shows its most immediate impact. (Nasruddin, 2025) finds that instant feedback improves speaking fluency and self-confidence, especially in classroom action research. (Sari et al., 2025) report that Chatbot AI enables real-time correction during conversation practice, boosting interactive engagement. In writing, (Amir, 2023) and (Yasmar et al., 2023) show AI-generated feedback strengthens revision cycles and grammatical awareness. In translation, (Latifah & Djamilah, 2024) observe that AI helps evaluate semantic appropriateness, while (Faris & Abdurrahman, 2023) highlight its role in comparative translation analysis. Overall, these findings suggest that generative AI enhances metacognitive monitoring by providing immediate evaluative input.

Nevertheless, critical examination reveals several pedagogical tensions. Instant feedback accelerates correction cycles, but overreliance on AI may weaken learners' internal error-detection. Dialectal bias and contextual inaccuracies (Kılıçkaya & Kic-Drgas, 2025) can compromise strategic decision-making if outputs are accepted uncritically. Academic integrity concerns (Supriyono et al., 2024) and risks of instructional dependency (Alkaabi & Almaamari, 2025) indicate that strategy development must be accompanied by ethical literacy. Furthermore, while conceptual analyses (Samiya, 2025) and

literature-based discussions (Mohideen, 2024) emphasize personalization and automation benefits, and mixed-method findings (Doohee, 2024) report increased engagement, longitudinal evidence on sustained metacognitive change remains limited.

Taken together, the fifteen reviewed studies indicate that generative AI functions as an external metacognitive scaffold supporting three interconnected strategic domains: learning planning, resource management, and process monitoring. The enhancement of these strategies depends on pedagogical mediation, digital literacy, and critical reflection, as generative AI amplifies strategic behaviors only when integrated within structured instructional design. From the perspective of the Technology Acceptance Model, observed improvements reflect perceived usefulness in facilitating efficiency and adaptive feedback (Venkatesh et al., 2003). Perceived usefulness is also highlighted by (Nasruddin, 2025). Observed improvements also reflect perceived ease of use (Ramadhan, 2023). Perceived ease of use is further emphasized by (Izzati et al., 2025). Nevertheless, the predominance of short-term interventions and perception-based evidence indicates that technology acceptance should not be equated with sustained strategic mastery. In this Systematic Literature Review, TAM serves as an interpretive framework to explain adoption patterns rather than as an empirically tested construct (Davis, 1989).

Overall, generative AI-based learning media meaningfully support the development of cognitive and metacognitive strategies in Arabic language learning, including systematic planning, adaptive resource use, and continuous monitoring. However, the depth and sustainability of these strategic improvements depend on ethical safeguards, teacher guidance, dialect-sensitive implementation, and longitudinal pedagogical evaluation. Future research should prioritize controlled comparative designs and long-term assessments to determine whether AI-assisted strategic gains lead to durable language proficiency outcomes.

Pedagogical and Contextual Challenges in the Implementation of Generative AI

As the adoption of AI-based generative learning media expands in Arabic language education, its implementation faces significant barriers and structural challenges. While generative AI shows pedagogical potential, synthesis of the fifteen reviewed studies indicates that integration is constrained by linguistic limitations, teacher readiness, technological disparities, and ethical concerns. These multidimensional challenges require critical examination to avoid overgeneralized claims of effectiveness and to inform context-sensitive implementation strategies (Satrio, 2025).

From a linguistic perspective, studies highlight limitations in grammatical accuracy, contextual appropriateness, and dialectal representation. (Latifah & Djamilah, 2024) identify contextual translation errors that may mislead students if AI outputs are accepted uncritically. (Faris & Abdurrahman, 2023) note that although generative AI performs well semantically, it lacks the nuanced linguistic sensitivity of experienced Arabic teachers. Critically, (Kılıçkaya & Kic-Drgas, 2025) reveal dialectal bias in Large Language Models, favoring standardized or non-contextual Arabic varieties. This bias poses pedagogical risks in sociolinguistically diverse contexts, where dialect awareness is crucial for communicative competence. Collectively, these findings indicate that generative AI cannot yet replicate the adaptive interpretive judgment needed for complex or culturally embedded Arabic texts.

Beyond linguistic issues, pedagogical readiness is a decisive factor. (Izzati et al., 2025) emphasize that the effectiveness of generative AI depends on teachers' ability to integrate it strategically into lessons rather than using it in isolation. (Ramadhan, 2023) notes that limited digital-pedagogical competence constrains optimal implementation. This challenge is compounded by instructional dependency, where educators may rely on AI-generated materials without critically assessing their pedagogical alignment (Alkaabi & Almaamari, 2025). Even in contexts reporting positive engagement (Doohee, 2024), the lack of

long-term strategic monitoring raises questions about whether AI integration leads to sustained instructional transformation or only short-term engagement.

Student related barriers are also significant. While generative AI can support self-regulated learning (Izzati et al., 2025), learners with low digital literacy may engage passively rather than strategically (Satrio, 2025). Uncritical reliance on AI-generated answers can weaken independent analytical reasoning, and academic integrity concerns (Supriyono et al., 2024) further complicate the issue. The ease of generating responses increases risks of plagiarism and superficial task completion, potentially undermining authentic skill development (Amir, 2023). These ethical vulnerabilities are particularly salient in writing and translation contexts, where AI assistance may blur the line between support and substitution (Latifah & Djamilah, 2024).

Methodologically, it is important to note that many studies reporting successful AI integration rely on short-term interventions or perception-based data. Improvements in speaking confidence (Nasruddin, 2025) and engagement gains (Sari et al., 2025) are encouraging but may not indicate sustained proficiency growth. Experimental findings (Jalaludin & Naseha, 2025) show measurable performance gains, yet lack longitudinal tracking. Conceptual and literature-based analyses (Samiya, 2025) highlight promising theoretical prospects but do not empirically validate long-term learning outcomes. This methodological landscape suggests that some reported challenges may be underexplored due to limited study duration and scope (Mohideen, 2024).

Technological infrastructure and disparities in access also constitute significant structural barriers. Variations in institutional readiness influence how generative AI is integrated, with contexts that have stable digital infrastructure experiencing smoother implementation, while institutions with limited support encounter inconsistent usage patterns that affect both access and equity. Overall, the literature suggests that the implementation of generative AI in Arabic language learning is shaped by linguistic limitations, pedagogical preparedness, digital literacy, ethical governance, and infrastructural readiness. These barriers

not only constrain performance outcomes but also limit the depth of strategic learning development, as AI may enhance efficiency without necessarily fostering deeper cognitive engagement in the absence of structured guidance.

From the perspective of the Technology Acceptance Model, these barriers act as moderating factors influencing perceived usefulness and ease of use (Davis, 1989) as external scaffolds that facilitate learnin. Linguistic inaccuracies and dialect bias may reduce perceived usefulness, while low digital literacy among teachers and students may decrease perceived ease of use (Venkatesh et al., 2003). Ethical concerns and academic integrity risks further moderate institutional acceptance. Within this Systematic Literature Review, TAM serves as a conceptual framework to interpret how structural and pedagogical constraints shape technology adoption rather than as an empirically tested causal model. In conclusion, although generative AI offers transformative potential for Arabic language education, its implementation depends on careful pedagogical design, ethical regulation, dialect-sensitive adaptation, and systematic professional development for educators. Future research should prioritize longitudinal and cross-contextual studies to examine evolving barriers and how structured interventions can mitigate them. Only through critical, context-aware integration can generative AI transition from experimental innovation to sustainable pedagogical practice.

Conclusion

Based on this Systematic Literature Review of fifteen selected studies, Artificial Intelligence-based generative learning media, particularly ChatGPT, Chatbot AI, and Large Language Models, demonstrate diverse applications in Arabic language learning, including curriculum integration, skill-based instruction, independent learning, translation practice, and assessment. Generative AI functions not merely as a content generator but as a strategic scaffold supporting learning planning, resource management, and process monitoring, thereby enhancing students' cognitive and metacognitive strategies.

Within the Technology Acceptance Model framework, adoption can be interpreted through perceived usefulness and perceived ease of use; however, cross-study analysis indicates that effectiveness depends heavily on pedagogical design, teacher mediation, institutional readiness, and learners' digital literacy.

The review also highlights significant barriers, including linguistic inaccuracies, dialectal bias, ethical risks related to academic integrity, and potential learner dependency, demonstrating that technological innovation alone does not ensure sustainable pedagogical impact. Conceptually, this study provides a systematic mapping of generative AI applications, their mediated relationship with learning strategies, and structural constraints influencing implementation. Future research should prioritize longitudinal experimental studies to assess the durability of AI-assisted strategic and proficiency development, controlled trials to examine the causal impact of AI-generated feedback on students' independent error-detection and metacognitive skills, cross-cultural comparative studies to evaluate dialectal adaptation and contextual effectiveness, and investigations into institutional ethical governance frameworks and teacher professional development interventions. Such targeted empirical research will strengthen the evidence base and support the responsible, context-sensitive, and sustainable integration of generative AI in Arabic language education.

This study has several limitations that should be considered. First, it is based on a relatively small sample of fifteen selected studies, which may limit the generalizability of the findings across diverse educational contexts. Second, the included studies vary in research design, methodology, and setting, which may affect the consistency and comparability of the results. Third, as a Systematic Literature Review, this study relies entirely on secondary data without direct empirical validation, limiting its ability to establish causal relationships between the use of generative AI and learning outcomes. In addition, potential publication bias and the dominance of short-term or exploratory studies may influence the conclusions drawn. Finally, given the rapid development of generative AI

technologies, some findings may quickly become outdated, highlighting the need for continuous updates and further empirical investigation to ensure relevance and accuracy.

Acknowledgment

The authors would like to express their sincere gratitude to Universitas Islam Negeri Siber Syekh Nurjati Cirebon for providing academic support and research facilities that made this study possible. The authors also extend their appreciation to colleagues and reviewers who provided valuable feedback and constructive suggestions during the completion of this research. Special thanks are given to all parties who contributed, directly or indirectly, to the successful completion of this study on the use of Artificial Intelligence-based generative learning media in improving Arabic language learning strategies.

Author Contributions

Ibnu Fazar contributed to the conceptualization of the study, data collection, data analysis, and manuscript drafting. Khasan Aedi was responsible for research design, methodology development, and critical revision of the manuscript. Durtam contributed to literature review, data interpretation, and final editing of the manuscript. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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