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Arabic Learning in Pesantren: Trends in Digitalization and AI Integration A Systematic Literature Review

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Abstract

This study examines the trends and patterns of digital media and artificial intelligence integration in Arabic language learning within pesantren contexts. Using a systematic literature review approach guided by PRISMA procedures, it analyzes 20 selected articles published between 2016 and 2026 from major academic databases. The findings reveal a growing use of digital and AI-based media to enhance learner engagement, motivation, and access to diverse learning resources, particularly in receptive skills such as listening and reading. Theoretically, these practices align with Computer-Assisted Language Learning (CALL) and constructivist learning theory, emphasizing interaction, autonomy, and active knowledge construction. However, several limitations persist, including short-term implementations, limited integration of multiple language skills, and the tendency to use technology as a supplementary rather than pedagogically grounded tool. This study contributes by providing a structured synthesis of current research trends and identifying critical gaps in the use of digital and AI-based media in pesantren settings. The findings highlight the need for more comprehensive, integrative, and longitudinal research to develop pedagogically sound and contextually relevant approaches to Arabic language learning.

Keywords: Arabic Language Learning, Pesantren (Islamic Boarding Schools), Digitalization, Artificial Intelligence, Systematic Literature Review.

A. Introduction

In recent years, research interest in the use of learning media for Arabic teaching has grown substantially, paralleling advances in educational technology and the increasing emphasis on student-centered learning (Bagus et al. 2024; Mustafa 2023). This growing body of literature spans a wide range of media types, from conventional media such as textbooks to multimedia-based digital media, and has been documented across various indexed databases

such as Google Scholar, Scopus, Springer, and ScienceDirect (Maulidi and Aisa 2023; Windawati and Koeswanti 2021). However, despite the accumulation of individual studies reporting the effectiveness of specific media on Arabic learning outcomes (Arrahma 2025), a systematic understanding of how this research field has developed, what patterns and trends characterize it, and where its gaps lie remains limited.

This gap becomes more pronounced in the context of Islamic boarding schools (pesantren), where the characteristics of the education system, which tends to be traditional, book-based, and centered on direct interaction between teachers and students, shape a distinct research landscape (Sardiyanah 2020; Agung 2022). Factors such as limited facilities, institutional policies, Islamic values, and variations in students' technological literacy have also been reported to influence how learning media research is conducted and reported within pesantren settings (Arifin et al. 2023; Rahmi and Nazhyfa 2024). To date, however, no study has systematically mapped these research trends, methodological patterns, and thematic gaps in a comprehensive manner. Therefore, this study aims to conduct a PRISMA-based systematic literature review (SLR) to identify research trends, characteristics, and research designs; examine the reported effectiveness of learning media as documented in the existing literature; and uncover research gaps in the study of Arabic language learning media within the pesantren environment. The findings of this study are expected to provide a conceptual map that can inform both future research agendas and the development of more adaptive and effective learning strategies (Hasbi 2025).

Various previous studies have shown that the use of media in Arabic language learning has a significant contribution to improving the quality of learning processes and outcomes. Study by (Suja et al. 2025) emphasized that the use of simple media such as drawing cards, videos, and game-based activities is able to create interactive and fun learning and support students' cognitive and language development. This is reinforced by the findings (Idhan et al. 2026) which shows that the use of mobile applications in Arabic language learning increases student flexibility, interactivity, and engagement, although it still faces constraints on teacher readiness and infrastructure aspects. In a broader context, (Mahyudin Ritonga et al. 2022) emphasizing that Arabic language learning needs to be positioned as an inclusive communication tool, not limited to a specific group, thus demanding more adaptive innovation of methods and media. Meanwhile, the context of pesantren as a typical learning environment also affects the use of media, as expressed by (Siregar et al. 2025; Taufiqurrochman 2025) which highlights the importance of integrating multicultural and contextual values including environmental issues in Arabic language learning. This shows that learning media not only

serves as a technical tool, but also as a means of integrating values, culture, and context in the learning process.

On the other hand, a systematic literature review (SLR-based) study revealed that although the use of technology in Arabic language learning continues to grow, there are still a number of limitations and research gaps that need to be considered. SLR research by (Muthoifin and Elbanna 2026) shows that the integration of technologies such as digital platforms and AI-based learning provides great opportunities in improving access and independence of learning, but is still faced with challenges such as the complexity of the Arabic language, the limitations of contextual curricula, and the lack of longitudinal studies. These findings are in line with the study (Fadlelmula and Qadhi 2024) which highlights barriers to technology implementation, such as low digital literacy and resistance to traditional approaches. In addition, SLR performed by (Alsayed et al. 2023) revealed that technology-based research for Arabic is still limited compared to other languages, especially in the development of computational models and quality datasets. Overall, these findings confirm the need for a more comprehensive and contextual SLR study to map research trends, evaluate the effectiveness of learning media, and identify research gaps that can be the direction of future development of Arabic language learning studies.

This research presents a more integrated approach by synthesizing the study of learning media, the context of Islamic education, and systematic literature review (SLR)-based analysis in one complete framework. So far, studies such as those conducted by Suja Aidillah and Mohamad Idhan tend to focus on the practice of using media in the classroom, while Asep Sopian and Rade Taufiqurrochman have highlighted the contextual dimension and value in learning Arabic. The study by Muthoifin shows the importance of a systematic approach, but it has not specifically mapped the use of learning media comprehensively. Therefore, this study offers a new contribution in the form of PRISMA-based systematic mapping of the trends, effectiveness, and gaps of media use research in Arabic language learning by utilizing sources from reputable databases, thereby producing a more comprehensive, structured, and contextual picture as the basis for future research and learning practice development.

To achieve the objectives outlined above, this systematic literature review is guided by five research questions formulated in accordance with the PRISMA protocol. These research questions were developed to ensure that the review process remains focused, replicable, and aligned with the identified research gap concerning the use of learning media in Arabic language learning within pesantren settings. Each research question is accompanied by its underlying motivation, purpose, and expected contribution, as summarized in Table 1.

Table 1. Research Questions

#	Research Questions	Motivation / purpose / benefits
RQ1	What are the trends, characteristics, and research designs in studies related to the use of learning media in Arabic language learning in Pesantren environments?	To map the progress of research, identify the methodological patterns used, and provide a comprehensive overview of the state of the art research in this field.
RQ2	How does the use of learning media affect Arabic learning outcomes, including language competence, motivation, and student involvement, compared to conventional learning methods?	To analyze the effectiveness of the use of learning media empirically and provide a scientific basis in pedagogical decision-making.
RQ3	What are the most widely used types of learning media, and what is the pattern of implementation in Arabic language learning in Pesantren?	To identify the variety of learning media and its implementation practices as a reference for educators in choosing the right strategy.
RQ4	What are the challenges and limitations in the integration of learning media in Arabic language learning in <i>the Pesantren</i> environment?	To uncover obstacles faced in practice and provide a basis for the development of contextual and applicative solutions.
RQ5	What are the research gaps that can be identified from previous studies, and what is the next research direction in optimizing the use of learning media in Arabic language learning in <i>the Pesantren</i> environment?	To find significant research gaps and formulate future research development directions to strengthen scientific contributions in this field.

As presented in Table 1, the five research questions progressively address distinct dimensions of the phenomenon under study, ranging from research trends and methodological patterns (RQ1), effectiveness of media use on learning outcomes (RQ2), implementation patterns of media types (RQ3), and integration challenges (RQ4), to research gaps and future directions (RQ5). This structure allows the review to move from descriptive mapping toward analytical synthesis, providing both a comprehensive picture of the current state of research and a scientific foundation for future studies in Arabic language learning within the pesantren environment.

B. Method

The method is optional for original research articles. This method is written in descriptive and should provide a statement regarding the methodology of the research. This method as much as possible to give an idea to the reader through the methods used. This study uses a systematic literature review (SLR) approach with reference to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. This approach aims

to identify, evaluate, and systematically synthesize previous research relevant to the use of learning media in Arabic language learning. Through this approach, the research seeks to provide a comprehensive picture of research trends, the effectiveness of learning media, and the research gaps that are still open (Joanne E et al. 2021).

Literature Search Strategy

Literature searches were conducted systematically on three reputable international databases, namely ScienceDirect, Springer, and Scopus. The search process uses a combination of keywords with Boolean AND and OR operators, namely ("Arabic language learning" OR "Arabic language teaching" OR "Arabic as a foreign language" OR "Arabic pedagogy") AND ("media" OR "instructional media" OR "learning media" OR multimedia OR "digital media" OR "educational technology"). The range of years of publication is limited to the period 2021 to 2026, with the type of document in the form of journal articles that have gone through a peer-review process (Firmansyah and Dede 2022).

Initial search results showed 274 articles consisting of 53 articles from Scopus, 47 articles from Springer, 72 articles from ScienceDirect, and 102 articles from GoogleScholar.

Inclusion and Exclusion Criteria

The inclusion criteria in this study include journal articles that discuss the use of learning media in Arabic language learning, available in full-text form, using English, and published in the range of 2022 to 2026. Meanwhile, the exclusion criteria include articles that are not relevant to the research focus, conference proceedings, books or book chapters, non-peer-reviewed articles, as well as studies that do not specifically address learning media in the context of Arabic language learning (Suhartono 2017).

Study Selection Process

The study selection process is carried out based on the PRISMA stages which include identification, screening, eligibility, and inclusion. At the identification stage, all articles obtained from the three databases were collected for a total of 274 articles. Furthermore, a screening process is carried out by reviewing titles and abstracts to assess the suitability of the research topic and removing irrelevant articles. At the eligibility level, articles that pass the initial selection are analyzed in more depth through full-text reading to ensure suitability with inclusion criteria (Cabrera and Cabrera 2023).

The final results of the selection process showed that as many as 20 articles were declared the most relevant and met all the criteria to be analyzed in this study. These articles are then used as the main source in the process of data synthesis.

Data Analysis Techniques

Data analysis was carried out using a qualitative descriptive approach with thematic analysis techniques. The selected articles were analyzed by grouping the findings into several main themes, namely research trends, the effectiveness of learning media, the types of media used, challenges in implementation, and research gaps. The analysis process is carried out systematically to produce a comprehensive and structured synthesis (Mangaroo-Pillay and Coetzee 2022). In addition, a coding process is carried out for each article to identify patterns, similarities, and differences between researches. The results of the analysis are then presented in the form of a descriptive narrative supported by a classification table to clarify the research findings.

Validity and Reliability

The validity and reliability of the research are maintained through the systematic and transparent application of the PRISMA procedure. The use of reputable databases and clear selection criteria aims to minimize bias in article selection. In addition, the analysis process is carried out consistently using a set thematic framework, so that the results of the research can be scientifically accounted for (Paul et al. 2021).

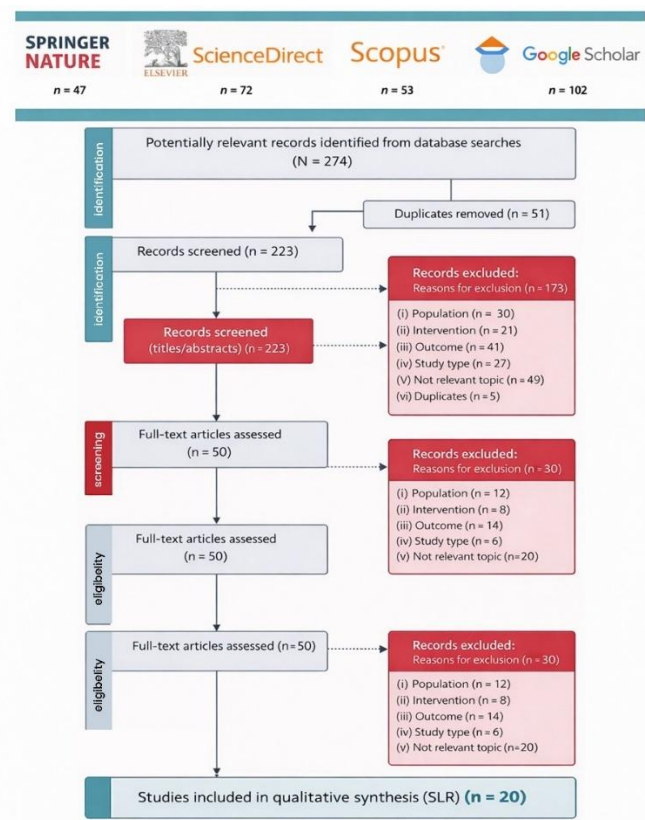


Figure 1. PRISMA Flow of Research Article Selection

The image shows the article selection process using the PRISMA flow which transparently explains how the number of studies was reduced from 274 to 20 final articles. At the identification stage, 274 articles were found from four databases (Springer Nature, ScienceDirect, Scopus, and Google Scholar). After removing duplication of 51 articles, 223

articles remained for the screening stage. At this stage, titles and abstracts were selected so that 173 articles were eliminated for various reasons such as population mismatch (n=30), intervention (n=21), outcome (n=41), type of study (n=27), irrelevant topics (n=49), and additional duplication (n=5). Furthermore, 50 articles passed the full-text assessment stage, but at the eligibility stage as many as 30 articles were again removed because they did not meet the same criteria (e.g. not relevant to the context of the pesantren or did not focus on learning media). Finally, only 20 articles met all the inclusion criteria and were used in the qualitative synthesis, so the decrease in the number of articles reflects a rigorous, systematic, and clearly criteria-based selection process according to PRISMA standards(Qasserras 2023).

A total of 20 articles analyzed in this study are scientific publications indexed in reputable databases, namely Scopus and SINTA (Science and Technology Index Indonesia). A quality appraisal was conducted using adapted criteria from systematic review standards, including: (1) clarity of research objectives, (2) methodological rigor, (3) sample adequacy, (4) validity of findings, and (5) relevance to the pesantren context. Each study was scored on a 1-3 scale (low-high quality). Only studies with moderate to high quality were included in the final synthesis(Hinderks et al. 2020).

C. Result and Discussion

Based on the systematic selection process within the framework of the Systematic Literature Review (SLR), 20 studies were obtained that specifically discussed the use of Arabic language learning media in Pesantren. These studies have met inclusion criteria that include contextual relevance, methodological clarity, and impact on learning processes and outcomes. A summary of the main characteristics of the selected studies is presented in the following table.

Table 2. Synthesis of Characteristics of Selected Studies on Learning Media in Pesantren

Code	Year	Researcher/Short Title	Method	Focus Skills	Main Impact	Challenge	Research Gap
S1	2026	ElevenLabs TTS	Mixed (experiment)	Listening	↑ significant (63→82)	Technology integration	Longitudinal & multi-skill studies
S2	2026	Visual Media Muthola'ah	Qualitative	Reading	↑ Understanding & Engagement	Limited media	Comparison of digital media
S3	2026	Google Sites Vocabulary	Qualitative	Vocabulary	↑ Retention & Motivation	A Lack of Speaking	Integration of productive skills
S4	2025	Wordwall Game	Experiments	Vocabulary	↑ Significance & Motivation	Media dependency	Long-term studies
S5	2025	Ibda' Magazine	Mixed	Reading	↑ Reading & Motivation	Static media	Digital integration
S6	2025	YouTube Speaking	Experiments	Speaking	↑ Speaking (N-Gain 0.60)	Small sample	Large-scale replication
S7	2025	Comic-based Learning	R&D	Speaking	↑ Significant (p<0.05)	Limited design	Multimedia development

S8	2025	Imrithi's Mapping	Mind	R&D	Nahwu	Valid & practical	Limited test	Experimental effectiveness
S9	2025	Suno AI Music		Qualitative	Listening + Vocab	↑ Motivation & Understanding	Short duration	Longitudinal studies
S10	2025	Audio-visual PPT		Experiments	General	↑ Significant (8.4 vs 6.3)	Dominant conventional methods	Media variety
S11	2025	Online OBE	Learning	Qualitative	General	↑ Access & Motivation	OBE Adaptation	Long-term evaluation
S12	2025	YouTube Model	Hybrid	Qualitative	Speaking + Listening	↑ Fluency & Comprehension	Distraction & access	Test hybrid model
S13	2025	R&D (ADDIE)		Digital mind mapping (Imrithi)	Nahwu	Valid & practical (3.9-4.2)	Limited test	Need for experimental and longitudinal effectiveness tests
S14	2024	Video Animation		PTK	Reading	↑ Interests & Learning Outcomes	Facilities	Small scale
S15	2024	Book Model	Reading	R&D	Reading	↑ Book Literacy	Complex implementation	Wide replication
S16	2023	Textbook Muhadatsah		R&D	Speaking	↑ Score (59→80)	Limited validation	Longitudinal studies
S17	2023	Google Classroom Kids		Qualitative	Multi-skill	↑ Speaking and Listening	Not all skills develop	Literacy integration
S18	2023	Thematic Dictionary		Qualitative	Speaking + vocab	↑ Basic Abilities	Basic level only	Further development
S19	2023	Canva Vocabulary		Mixed	Vocabulary	↑ Motivation & Focus	Digital literacy	Experimental studies
S20	2022	"Istima" Movie		Qualitative	Listening	↑ Interest & Understanding	Media access	Quantitative effectiveness

In general, the twenty selected studies show significant variation in the type of media used, the methodological approach adopted, and the context of implementation within the pesantren environment. A closer reading of Table 2 reveals a clear temporal pattern: studies published in 2022 and 2023 are dominated by relatively passive media such as thematic dictionaries, textbooks, and single-platform tools, whereas studies from 2025 onward increasingly involve AI-based and multimodal media such as ElevenLabs TTS and Suno AI. This shift suggests that media innovation in this field has accelerated only in the last two years, rather than developing gradually over time.

A second pattern is visible in the distribution of focus skills. Most studies concentrate on receptive skills, namely listening, reading, and vocabulary, while only a small number, such as S6, S7, and S12, address speaking as the primary focus. None of the twenty studies target writing (*kitābah*) as the main skill. This imbalance indicates that the development of learning media in pesantren has so far prioritized input-based competencies over productive language use, a pattern that becomes the basis for the thematic synthesis in the following sections.

1. Interactive Media Trends in Arabic Language Learning in the Last 5 Years

Based on the results of the synthesis of the analyzed study, Arabic learning media in the pesantren environment shows a significant transformation, from the use of conventional media

to digital-based and interactive media (Setiyono 2025). This transformation is not only influenced by technological developments, but also by the need to increase the effectiveness of Arabic language learning that is more communicative and contextual.

In general, learning media used in pesantren can be classified into three main categories, namely: (1) visual and print media, (2) audio-visual media, and (3) interactive digital media. These three categories show the existence of a spectrum of media development from traditional to modern, and reflect the adaptation of pesantren to the demands of 21st century learning (Sarah et al. 2024; Huda et al. 2017).

a) Visual and Print Media (Conventional-Adaptive)

Visual and print media are the earliest forms of media and remain widely used in Arabic learning in Pesantren, including interactive textbooks, comics, wall magazines such as *Ibda'*, and other static visual media (Zulpina et al. 2025). This medium remains relevant for three reasons: it is accessible without depending on technological infrastructure (Yasin, Wahyu Rinawati, and Putri 2025), it aligns with the pesantren's textual and book-based learning culture, and it effectively supports basic reading (*qirā'ah*) and vocabulary (*mufradāt*) skills (Setiyadi, Anhar, and Muttaqin 2025). Its main limitation is low interactivity: the learning process is largely one-way and offers little space for developing speaking (*kalām*) or authentic communication (Syaifullah et al. 2023). Within the twenty studies reviewed, this category is concentrated in research published before 2024, positioning it more as a baseline than as an active area of ongoing innovation.

b) Media Audio-Visual

The use of audio-visual media, including YouTube, learning videos, animated content, and interactive PowerPoint, has become increasingly integrated into Arabic learning in Pesantren (Putri et al. 2025; Dodi, Testiana Deni, and Charanjit Kaur Swaran, Singh Entika Fani 2021). This media shows strong effectiveness in improving listening (*istimā'*) and speaking (*kalām*) by presenting language in a more authentic, communicative context (Ahmad Mustofa et al. 2025; Arisandi and Habib 2025). Combining visual and audio elements also increases motivation and engagement compared to conventional media (Dewi 2022; Masaji, Fatoni, and Ahmad 2025). Compared to visual and print media, this category shows a clear advantage in supporting productive skills, marking it as a transitional form between text comprehension and oral communication practice (Mearaj et al. 2021).

c) Interactive Digital Media

Interactive digital media, including Google Sites, Canva, Google Classroom, digital mind mapping, and AI-based tools such as Suno AI, is the fastest-growing category in recent years (Hussein et al. 2022). It shows strong impact on affective and cognitive aspects of learning, increasing motivation, engagement, and vocabulary retention through multimodal and interactive materials (Najib et al. 2025), while also allowing more flexible, self-paced access than conventional media (Prastiwi, Masruroh, and Rumberoa 2021). However, its contribution to communicative competence remains limited: improvements in vocabulary understanding do not consistently transfer into actual speaking practice (Mahyudin Ritonga et al. 2023). Set against the two other categories, this pattern suggests a developmental progression rather than a simple replacement of older media: print media builds receptive foundations, audio-visual media bridges input and output, and interactive digital media extends access and motivation, yet none has fully closed the gap between language input and communicative output.

2. Research Methods in the Study of Arabic Language Learning Media in Pesantren

a) Distribution and Dominance of Methodological Approaches

The results of the synthesis of the analyzed studies show that the methodological approach in the research of Arabic learning media in Pesantren is dominated by the Research and Development (R&D) model, followed by qualitative, experimental approaches, and to a lesser extent mixed methods and surveys. The dominance of R&D is evident in research oriented towards the development of media products, such as textbooks, digital media, and technology-based learning instruments. These studies generally emphasize the design stage, expert validation, and limited trials that produce the category of "feasible" or "very feasible" as indicators of success (Syafei, Suleman, and Robanda 2024).

On the other hand, the qualitative approach also shows a high intensity of use, especially in exploring learning practices in the pesantren environment that have distinctive social, cultural, and pedagogical characteristics (Setiyadi, A. C., Anhar, A., & Muttaqin 2025). This approach allows for an in-depth exploration of learning dynamics, including teacher-student interaction, media adaptation, and the context of language use. The experimental method occupies the next position with a significant contribution in testing the effectiveness of learning media quantitatively. Experimental studies generally use a quasi-experimental design with control groups and experiments to measure improvement in language skills, especially in the aspects of vocabulary, listening, and speaking (Azka, Hafsoh, and Ibrahim 2024).

Meanwhile, the use of mixed methods and surveys is relatively limited, although both have the potential to integrate the power of quantitative and qualitative approaches in understanding learning phenomena more comprehensively (Sunarko, Solehudin, and Sakinah 2026).

b) Research Direction and Orientation

Conceptually, the dominance of R&D methods reflects strong awareness among researchers of the need for media reform as pesantren education transforms toward more modern and interactive learning. However, most R&D studies stop at the product validation and limited trial stages without proceeding to large-scale or long-term implementation evaluation, meaning that success is typically measured by feasibility rather than by sustained impact on language competence (Price, A., Beckey, A., & Collins 2024).

Experimental research complements this by empirically proving media effectiveness, with findings showing significant improvement in learning outcomes, particularly through digital and audio-visual media (Yoke et al. 2024). though the small sample sizes and short durations common to this approach limit its ability to capture long-term impact. Qualitative approaches, meanwhile, excel at exploring context and meaning within pesantren's distinctive learning practices, but their findings are difficult to generalize across settings (Dewi 2022).

Taken together, these three approaches reveal a methodological pattern in which depth (qualitative), rigor (experimental), and innovation (R&D) have so far developed in isolation rather than being combined within a single research design.

3. The Impact of Media Use on Arabic Language Learning in Pesantren

The synthesis of studies indicates that learning media in pesantren significantly influence three key dimensions of learning, namely cognitive, affective, and psychomotor, while also facing notable implementation challenges. These dimensions reflect not only learning outcomes but also an ongoing pedagogical shift toward more interactive and technology-supported Arabic language learning.

Table 3. Multidimensional Impacts of Digital Media in Arabic Language Learning

Dimension / Aspect	Focus	Key Impact	Explanation
Cognitive	Knowledge & comprehension	Improved vocabulary, reading, listening	Digital and audiovisual media enable contextual and multimodal learning, shifting from memorization to understanding
Affective	Motivation & engagement	Increased interest, participation	Interactive tools (e.g., games, platforms, visual media) create a more engaging and less monotonous environment
Psychomotor	Productive skills (speaking)	Partial improvement	Interactive audiovisual media support speaking practice, but non-interactive media limit output development

Technical Challenges	Infrastructure	Limited access & unstable internet	Constrains optimal use of digital media
Pedagogical Challenges	Teacher readiness	Low integration of technology (TPACK)	Media often used without clear instructional strategy
Media Characteristics	Nature of media	Distraction & overreliance	Digital platforms may reduce focus if not well-managed
Instructional Design	Skill integration	Fragmented learning (not all skills integrated)	Many media focus on single skills rather than comprehensive language mastery

In the cognitive dimension, learning media have consistently improved students' receptive language skills, particularly vocabulary acquisition, reading comprehension, and listening ability (M Ritonga et al. 2024). largely driven by digital and audiovisual tools that provide authentic and contextual language exposure and allow learners to move beyond rote memorization toward meaningful understanding (Solehudin, Hanifansyah, and Izzuddin 2024).

The affective dimension shows the most consistent improvement across the reviewed studies, with media ranging from interactive platforms to simple contextual materials reported to enhance motivation, interest, and active participation (Yasin et al. 2023; Syaifullah et al. 2023). The psychomotor dimension, particularly speaking skills, shows more varied outcomes: interactive audiovisual media can facilitate language production through modeling and simulation, but many media forms still offer limited opportunities for active practice (Lazuardi et al. 2025). Read together, these three dimensions reveal an uneven pattern of impact, in which media consistently succeed at building comprehension and motivation but only partially succeed at converting that engagement into productive language output, pointing to a persistent input-output gap in current media design (Lu 2022).

This uneven impact is closely tied to four recurring implementation obstacles identified across the synthesis: technical, pedagogical, media-related, and instructional design (Hasim et al. 2025). On the technical side, limited infrastructure and unstable internet access constrain optimal use of digital media (Hamka and Susiawati 2024). Pedagogically, teachers' readiness remains relatively low, particularly in mastering technology integration (TPACK), so media is often used without a clear instructional strategy (Ma'Mun et al. 2021). In terms of media characteristics, digital tools such as YouTube carry a risk of distraction and unmanaged dependence (Arisandi and Habib 2025). while in instructional design, most media still target a single language skill rather than integrating the four maharah comprehensively. Taken together, these obstacles suggest that the partial gains seen in the psychomotor dimension are not simply a limitation of the media itself, but a reflection of how media is implemented within a system that has not yet resolved its technical, pedagogical, and design constraints.

Research Gap in the Study of Arabic Language Learning Media in Pesantren

- 1) Underdeveloped Evaluation of AI-Based Media for Productive and Structural Language Skills

Among the twenty reviewed studies, AI-based media appears only in the two most recent entries, S1 (ElevenLabs TTS) and S9 (Suno AI Music), both published in 2025-2026 and both targeting listening and vocabulary rather than speaking, writing, or grammatical competencies such as *nahwu* and *sharf*. No study to date has evaluated whether AI-based tools can support the development of productive skills or structural language knowledge in the pesantren context. Given the rapid emergence of these tools, this represents a narrow but rapidly closing window for research that could shape how AI-based media is adopted in Arabic language learning going forward.

2) Weaknesses in the Learning Evaluation System

A review of Table 2 shows that every study evaluates media within a single category, either visual and print, audio-visual, or interactive digital, rather than comparing categories directly. As a result, claims about the relative effectiveness of one media type over another rely on comparisons across separate studies with different samples, durations, and outcome measures, rather than on within-study comparisons. A comparative design that tests two or more media categories on the same cohort would allow more defensible conclusions about which media type is most suited to which language skill and learning context within pesantren.

D. Discussion

A synthesis of various studies shows that the transformation of Arabic language learning in the pesantren environment has moved significantly towards the integration of digital media and artificial intelligence (Özdemir 2025; Tseng and Lin 2026). Various previous studies have consistently confirmed that the use of media such as YouTube, AI TTS, Wordwall, Canva, and web-based platforms is able to increase motivation, engagement, and learning outcomes, especially in receptive skills such as listening and reading (Shamsi and Bozorgian 2024). However, most of these studies are still operating within a partial framework, both in terms of targeted skills, duration of implementation, and depth of pedagogical integration.

The findings of this study reflect key principles of both Computer-Assisted Language Learning (CALL) and constructivist learning theory, particularly in showing that digital media contributes to increased learner engagement, motivation, and access to diverse learning resources. From a CALL perspective, the use of platforms such as digital applications and AI-based tools supports more flexible and individualized learning experiences. However, most implementations remain limited to content delivery rather than facilitating deeper interaction or adaptive learning processes. Similarly, from a constructivist standpoint, although digital media has the potential to promote active knowledge construction, many studies still position learners

as passive recipients of information rather than active participants in meaning-making. This indicates a gap between the theoretical potential of technology-enhanced learning and its practical application in the pesantren context. Therefore, a more intentional integration of CALL and constructivist principles is needed to ensure that technology use not only enhances access but also fosters active, meaningful, and sustained language learning.

In this context, this research presents a more integrative position by not only placing technology as an auxiliary tool, but as part of a learning ecosystem that is in harmony with the typical characteristics of Pesantren (Hamid et al. 2024). If previous studies tended to emphasize the effectiveness of one type of media separately, this study actually shows how technology, especially AI-based, can be systematically orchestrated to support the cognitive, affective, and contextual processes of students. This study does not propose a fully developed integrative model; however, it provides important analytical insights into how digital media and AI are currently used in fragmented ways across different studies. The findings highlight a clear need for a more coherent and theory-driven approach that integrates technological tools with pedagogical and contextual considerations in pesantren environments.

Furthermore, previous findings also show a tendency that improving learning outcomes is often not followed by sustainability or skill transfer to productive domains such as speaking and writing. This is where the strengthening of this research lies, which implicitly offers a new direction in the form of inter-skill integration and the potential for the development of continuous learning models. This is important considering that the pesantren environment has a unique dynamic, namely a combination of oral traditions, spiritual values, and the demands of educational modernization.

The implications of these findings are not only pedagogical, but also strategic. For educators, this research opens up opportunities to design learning that is no longer fragmented, but integrated and adaptive to technological developments. For institutional managers, these results can be the basis for formulating policies to strengthen digital literacy that remain rooted in Pesantren values. Meanwhile, for learning media developers, this study emphasizes the importance of presenting content that is not only visually and technically attractive, but also contextual and culturally relevant.

In the future, the direction of research in this field needs to shift from just exploring effectiveness to developing models that are longitudinally tested and can be replicated in various Pesantren contexts. In addition, the integration of artificial intelligence with communicative and real-interaction-based approaches is a promising area for further development. Thus, Arabic learning in Pesantren is not only able to answer the challenges of

the times, but also contributes to forming complete, adaptive, and sustainable language competencies.

E. Conclusion

This study set out to map the trends, effectiveness, media types, challenges, and research gaps in Arabic language learning media within pesantren through a PRISMA-based review of twenty studies (2022 to 2026). The synthesis shows that media use has shifted from conventional visual and print forms toward audio-visual and, more recently, AI-based interactive media, with this shift intensifying sharply in the last two years (RQ1, RQ3). Media consistently strengthen the cognitive and affective dimensions of learning, particularly vocabulary, reading, listening, motivation, and engagement, but their contribution to speaking remains partial, revealing a persistent gap between language input and productive output (RQ2), a pattern compounded by a methodology still dominated by Research and Development designs oriented toward product validation rather than sustained implementation, alongside recurring technical and pedagogical challenges (RQ4). From this synthesis, two priority gaps emerge: the near absence of evaluation for AI-based media on productive and structural skills such as speaking and *nahwu-sharf*, and the lack of research designs comparing media categories directly within a single study rather than across separate ones (RQ5).

The novelty of this study lies in offering the first PRISMA-based mapping that integrates trends, effectiveness, media typology, and research gaps into one comprehensive framework specific to Arabic learning media in pesantren, a synthesis that prior studies focused narrowly on classroom practice, contextual value, or general systematic review methodology have not provided. Theoretically, the findings extend Computer-Assisted Language Learning and constructivist learning theory by showing that digital media in the pesantren context has so far been more effective at enabling access and engagement than at fostering the active, meaning-making processes constructivist theory anticipates. Practically, this study offers educators, institutional leaders, and media developers a structured evidence base for selecting media aligned with specific language skills and prioritizing productive-skill and structurally focused AI tools that current offerings largely overlook, pointing future research toward longitudinal, cross-category comparative designs that integrate multiple language skills.

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