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Implementation of Multisensory Strategies in Arabic Language Learning for Students with Phonological Disorders: A Literature Review

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Keywords:
Phonological disorders; Arabic language instruction; multisensory strategies; interactive media; individualized intervention

Abstract

This study is a literature review aimed at identifying effective instructional strategies for teaching Arabic to students with phonological disorders. Although numerous studies have addressed Arabic language instruction and phonological therapy separately, the integration of the two remains limited. This research adopts a narrative literature review approach by analyzing scholarly articles published between 2020 and 2025, sourced from databases such as Scopus, Google Scholar, ScienceDirect, ResearchGate, and Garuda Kemdikbud. The findings indicate that multisensory strategies, phonology-based phonetic exercises, and the use of interactive technologies (such as audio-visual media and educational applications) are effective in enhancing students' abilities to recognize, differentiate, and produce sounds in Arabic. The review also highlights the importance of individualized interventions and collaboration between teachers and speech therapists in designing inclusive instruction. These findings provide a conceptual foundation for the development of Arabic language instruction that is responsive to the needs of students with special educational needs.

Kata kunci:
Gangguan fonologis; pembelajaran bahasa Arab; strategi multisensori; media interaktif; intervensi individual

Abstrak

Penelitian ini merupakan tinjauan literatur yang bertujuan untuk mengidentifikasi strategi pembelajaran yang efektif dalam mengajarkan bahasa Arab kepada siswa dengan gangguan fonologis. Meskipun telah banyak penelitian yang membahas pembelajaran bahasa Arab dan terapi fonologis secara terpisah, integrasi antara keduanya masih terbatas. Studi ini menggunakan pendekatan *narrative literature review* dengan menganalisis artikel ilmiah yang diterbitkan antara tahun 2020 hingga 2025 dan diperoleh dari basis data seperti Scopus, Google Scholar, ScienceDirect, ResearchGate, dan Garuda Kemdikbud. Hasil kajian menunjukkan bahwa strategi multisensori, latihan fonetik berbasis fonologi, serta pemanfaatan teknologi interaktif (seperti media audio-visual dan aplikasi pembelajaran) efektif dalam meningkatkan kemampuan mengenali,

membedakan, dan memproduksi bunyi dalam bahasa Arab. Kajian ini juga menyoroti pentingnya intervensi individual dan kolaborasi antara guru dan terapis wicara dalam merancang pembelajaran yang inklusif. Temuan ini memberikan dasar konseptual bagi pengembangan pembelajaran bahasa Arab yang responsif terhadap kebutuhan siswa berkebutuhan khusus.

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INTRODUCTION

Arabic is characterized by a unique and complex phonological system, comprising several phonemes that are absent in many other languages, such as ḥā’ (ح), ṣād (ص), and ḍād (ض). These phonemes require specific articulatory techniques, which often pose challenges for non-native learners, particularly those with phonological disorders (Salim, 2024). Phonological disorder itself is a type of speech impairment marked by difficulties in recognizing, distinguishing, and systematically producing sounds within a language(Salim, 2024). Phonological disorder is a type of speech disorder characterized by difficulty in recognizing, distinguishing, and producing sounds systematically in a language(Fauzi & Rahmawati, 2025). According to McLeod dan Crowe (2018), the prevalence of speech sound disorders in school-aged children is around 8%, making it a potential obstacle in learning foreign languages, including Arabic (McLeod & Crowe, 2018).

In the Indonesian context, learning Arabic faces specific challenges, one of which is the lack of attention to students with phonological disorders (Allail & Maulani, 2024). Difficulties in distinguishing and pronouncing unique Arabic sounds are often found, especially among students who do not have a strong phonological background in Arabic (Kamalia, 2024). Inaccurate pronunciation not only affects the phonetic aspect but also hinders meaning comprehension, grammatical structure, and overall fluency in verbal communication.

Based on initial observations in several educational institutions, many students experience difficulties in accurately producing Arabic phonemes. This is worsened by teaching approaches that have not integrated phonological disorder strategies

systematically. Previous studies often discuss Arabic language teaching and phonological therapy separately. For example, Fauzi and Rahmawati (2025), emphasized the importance of evaluating speaking skills in Arabic language learning, but did not link it directly to phonological therapy approaches (Fauzi & Rahmawati, 2025).

On the other hand, recent research shows that phonological therapy has great potential in improving students' phonetic abilities. Takalafiya (2023) emphasized the importance of student-centered approaches to enhance phonemic awareness in Arabic learning (Takalafiya, 2023). Farag et al. (2024) compared phonological awareness training with traditional therapy and found that phonological awareness was more effective in improving phonological skills in children with speech disorders (Farag et al., 2024). In addition, visual-auditory approaches such as Visual Phonics have also been proven effective in improving speech production, including for students with hearing impairments (Nur Kart, 2023)

Based on that background, this study aims to develop Arabic language learning strategies based on phonological therapy specifically designed for students with phonological disorders. These strategies include sound identification methods, intensive articulation exercises, and the use of visual-auditory techniques to strengthen understanding and production of Arabic sounds.

Theoretically, this study is based on phonological studies in linguistics and phonological therapy approaches in language learning. Phonology is a branch of linguistics that studies sound patterns in language and how the sounds are produced and processed cognitively by humans. Phonological therapy has been proven effective in helping students with speech sound disorders overcome phonetic difficulties in the learning process (Ana & Muballighin, 2024)

Therefore, this study is expected to contribute to the development of more inclusive and adaptive Arabic language learning strategies for students with phonological disorders. Besides serving as a practical reference for teachers and education practitioners, the results of this study are also expected to enrich Arabic language learning theories in Indonesia, especially in the field of phonology.

METODE

This study employs a qualitative method with a library research approach to explore Arabic language learning strategies for students with phonological disorders.

The library research method was chosen because it is suitable for examining theoretical concepts, previous research findings, and pedagogical approaches that have been developed in the fields of phonology and Arabic language learning.

Data were collected through a systematic search in several national and international academic databases, including Scopus, Google Scholar, ScienceDirect, ResearchGate, and Garuda Kemdikbud. The keywords used in the search process included: "phonological disorder in language learning," "Arabic phonology teaching strategies," "phonological therapy in Arabic," and "multisensory approach in language acquisition."

Data analysis was conducted using a thematic analysis approach, by categorizing information into key themes such as multisensory approaches, phonological therapy, supporting learning technologies, and curriculum adaptation for special needs. To maintain validity and objectivity, the analysis process was carried out iteratively, accompanied by literature triangulation techniques and cross-checking with secondary sources. The results of this process are expected to present inclusive, adaptive, and needs-based Arabic language learning strategies for students with phonological disorders.

RESULTS AND DISCUSSION

Technological advancement has brought significant changes to various aspects of human life, including the field of education. In the context of Arabic language learning, innovative approaches are essential to overcome challenges such as phonological disorders among students. In this study, it was found that learning strategies such as multisensory approaches, audio-visual technology, phonetic exercises, and individualized interventions play an important role in improving Arabic language skills in students with phonological disorders. These findings are consistent with previous studies that highlight the potential effectiveness of such approaches.

Multisensory Approach

The multisensory approach is a teaching strategy that engages multiple senses—such as sight, hearing, touch, and movement—to help students better understand and retain information (Gustiani et al., 2022). In the context of Arabic language learning for students with phonological disorders, this approach offers several advantages, particularly in enhancing phonological skills through diverse sensory stimulation.

The multisensory approach is grounded in the principle that learning involving more than one sensory pathway can strengthen cognitive processes and support students with special needs, including those with phonological disorders(Meilina et al., 2023). The use of multisensory methods facilitates students in recognizing challenging sounds and establishing stronger connections between sounds and letter symbols.

This approach not only helps students with phonological disorders to better identify and reproduce sounds, but also increases their engagement in the learning process. Students who learn through multisensory methods tend to have better memory retention compared to those who learn using only a single sensory modality(Utomo et al., 2023).

A study conducted by Gustiani, Asmiati, and Pratama (2022) demonstrated that the multisensory method is effective in improving early reading skills in children with reading difficulties. Through a combination of visual, auditory, kinesthetic, and tactile stimulation, the subject's ability to read vowel letters increased from 20% before the intervention to 88.12% after the intervention. Meanwhile, the ability to read consonant letters rose from 6% to 82.12%. These results confirm that the multisensory approach can significantly assist children in recognizing and pronouncing letters that were previously difficult to understand.

In addition, this approach helps to overcome psychological barriers such as frustration or lack of motivation, which are commonly experienced by students with phonological disorders. By engaging multiple senses, the learning process becomes more engaging and enjoyable.

The application of the multisensory approach in Arabic language learning includes the following strategies:

1. **Visual Media:** The use of illustrated flashcards with Arabic text that includes phonetic symbols can help students associate sounds with visual representations. For example, images of objects beginning with specific letters can reinforce the connection between letters and their corresponding sounds (Rahma & Tohe, 2025).
2. **Auditory Media:** Recording the pronunciation of Arabic letters and words provides clear examples of sounds. Teachers can utilize audio devices or specially designed applications to train students' phonological skills(Fitriani et al., 2025).

3. **Kinesthetic and Tactile Media:** Activities such as writing Arabic letters in sand or on tactile boards can assist students in understanding the shapes of letters through touch. Additionally, students can trace letters with their fingers to strengthen motor memory (Sessiani, 2022).
4. **Multisensory Combination:** Activities that combine visual, auditory, and kinesthetic elements—such as singing while pointing to letters or words—can enrich students' learning experiences (Muhammad Hasan Khoirudin et al., 2025).

Although the multisensory approach offers numerous benefits, several challenges must be addressed, such as limited resources (e.g., teaching aids or supporting media), lack of teacher training in implementing this method effectively, and the time required to design and implement multisensory activities tailored to students' needs. However, these challenges can be overcome through collaboration among teachers, parents, and schools in providing adequate facilities and training.

Audio-Visual Technology

Audio-visual technology is a highly effective approach for assisting students with phonological disorders in learning Arabic. This technology enables students to utilize both visual and auditory feedback simultaneously, thereby strengthening their learning process (Raudatussolihah, 2022). The implementation of audio-visual technology in Arabic language learning includes the following components:

1. Use of Video Media for Phonological Learning

Video media plays a crucial role in providing students with clear pronunciation models. Animated videos or live recordings can help students understand phoneme distinctions that are often difficult to articulate. In the context of Arabic, videos demonstrating the articulation of Hijaiyah letters with correct mouth positions are highly beneficial for students with phonological disorders (Asnidar & Junaid, 2022). For example, videos enhanced with slow-motion visuals of mouth movements during the pronunciation of specific letters can greatly aid student comprehension.

2. Audio-Based Learning Applications

Audio-based applications are designed to help students listen to and mimic specific sounds in Arabic. These technologies allow students to repeat sounds as needed. Some applications even feature voice recognition tools that provide immediate feedback on pronunciation accuracy. For instance, the "Belajar Hijaiyah" app offers interactive

learning through pronunciation games and automated assessment (Noptario & Prastowo, 2022).

3. Use of Interactive Software

Interactive learning software can serve as an effective tool for increasing student engagement. These programs often include listening and speaking exercises that allow students to record their voices and compare them with a correct pronunciation model (Hijriyah et al., 2022). A study by (Safitri et al., 2025) demonstrated that digital-based interactive media not only improves overall Arabic language skills but also specifically supports phonological skills such as listening and speaking. Students using the software were able to correct mispronunciations and improve phonemic accuracy by recording and comparing their voices with accurate models. Statistically, phonological test results showed significant improvement, with an average pre-test score of 65.4 (SD = 7.2) and a post-test score of 81.7 (SD = 6.5). A paired t-test yielded $t(86) = 9.45$ with $p < 0.001$, indicating a statistically significant improvement in phonological abilities after using the interactive software.

4. Integration of Augmented Reality (AR) in Phonological Learning

Augmented reality (AR) is an emerging innovation in phonological instruction. With AR, students can view three-dimensional Arabic letters that move in sync with the sounds being articulated (Suryadi, 2021). This technology provides a more immersive learning experience, helping students with phonological disorders to visualize and understand letter structures and sounds more effectively.

5. Educational Podcast Applications

Educational podcasts are audio media that students can access anytime. These podcasts typically contain content on letter pronunciation, intonation, and usage examples in sentences. A key advantage of podcasts is their flexibility, allowing students to learn anytime and anywhere. A study by (Fathonah & Majid, 2024) confirmed the effectiveness of the YouTube channel *Arab Podcast* as a medium for Arabic language instruction. Using qualitative methods, they analyzed the content and discourse of the videos, especially those based on the textbook *Takalam Al-Arabiyah Jilid 1*. The study found that *Arab Podcast* presents material systematically and communicatively by combining the *As-Sam'iyah As-Syafahiyah* (listening and speaking) method, a communicative approach, and the use of native speaker audio with engaging

visualizations. The learning components include material introduction, structured explanations, practical exercises, and interactive elements through comment sections. These findings highlight that *Arab Podcast* not only provides an effective learning resource but also fosters an active learning community that enhances student motivation and engagement. Active interaction, positive feedback, and learning flexibility make it highly relevant and accessible to students across various skill levels. Therefore, *Arab Podcast* has proven to be an effective tool for supporting both independent and collaborative Arabic language learning in the digital age.

6. Evaluating the Effectiveness of Audio-Visual Technology

The implementation of audio-visual technology should be accompanied by consistent evaluation to ensure its effectiveness. Teachers can use assessment rubrics to measure how well the technology supports students in understanding Arabic phonology. These rubrics might include criteria such as sound differentiation ability, pronunciation accuracy, and students' confidence levels when speaking (Hasanah, 2022).

Audio-visual technology offers various innovative solutions to help students with phonological disorders learn Arabic. Media such as videos, audio applications, interactive software, and podcasts provide rich and diverse learning experiences. Additionally, technologies like augmented reality present new opportunities to create deeper learning engagement. However, it is essential for teachers to continuously evaluate the use of such technology to ensure that instruction remains effective and aligned with students' specific needs.

Phonetic Training

Phonetic training is a crucial strategy in teaching Arabic to students with phonological disorders. This strategy aims to help students overcome difficulties in recognizing and pronouncing specific sounds that may not exist in their native language (Amrullah, 2016). Through systematic practice, students can improve their articulation skills and fluency in speaking Arabic.

Phonetic training, as part of a multisensory approach, has been proven effective in enhancing students' Arabic speaking abilities. Irhamni and Kholisin (2020) developed a phonetic accuracy-based learning model integrated into *kalam* (speaking) skills to support improvements in articulation and pronunciation. This model was designed systematically through three main stages: planning, implementation, and evaluation. In a

trial conducted among students in the Arabic Language Education program, the use of this model significantly reduced phonetic errors. The study found that the model not only met content and construct validity criteria based on expert evaluations but also demonstrated effectiveness in practice. Students who participated in the program showed more accurate pronunciation, especially with phonemes that are often misarticulated, such as letters with similar *makhraj* (articulation points). Additionally, student engagement increased during the learning process, as the phonetic approach emphasized auditory sensitivity and structured articulation exercises (Irhamni, 2020).

Research shows that phonetic training can yield significant results in improving phonological skills among students with phonological impairments. For example, a study by Kamilaturahmi et al. (2020) found that the use of the phonetic method was effective in enhancing the pronunciation of the consonant /r/ in first-grade hearing-impaired children at the SLB Center Payakumbuh. After undergoing intervention using phonetic methods, students' pronunciation ability improved from an initial range of 0–20% to 40–80% by the final phase. These results demonstrate the effectiveness of phonetic methods in improving pronunciation among children with hearing impairments (laila Kamilaturahmi & Hasan, Yarmis, 2020). Thus, phonetic accuracy-based approaches are proven to be both relevant and applicable in Arabic language instruction, particularly for students facing phonological difficulties.

Several methods can be employed in phonetic training to support students with phonological disorders in learning Arabic. These include:

1. **Drilling** The drilling technique involves repeated practice of specific sounds to help students learn articulation patterns. Research by (Sofa, 2024) demonstrates that phonetic drills are effective in improving pronunciation in English, particularly in terms of intonation, stress, and clarity of speech. However, the application of this technique presents challenges, such as student boredom due to repetition and difficulties in adjusting the technique to suit varying proficiency levels. The study recommends regular and creative use of drilling to accelerate students' pronunciation development.
2. **Recording and Self-Evaluation** This method involves students recording their speech and comparing it to a provided model. It allows learners to self-assess and focus on correcting their errors. Integrating follow-up classroom activities where

students discuss their self-assessments and negotiate linguistic forms from their recordings can activate metalinguistic awareness and student knowledge, thus facilitating reflection on form (Tiwari, 2024).

3. **Use of Interactive Media** Technological tools such as phonics-based applications can provide real-time feedback to learners. For instance, applications can assess the accuracy of pronunciation and offer corrective suggestions. (Dona et al., 2024) developed an AI-based tutor for Arabic language instruction and pronunciation training. This system offers a self-directed learning environment, allowing students to practice pronunciation with automated feedback, which significantly enhances their confidence and speaking abilities.
4. **Context-Based Practice** Phonetic exercises should not be limited to word level but should extend to sentences and conversational contexts. This helps students understand how sounds are used in real-life communication. The articulatory approach to pronunciation teaching considers second-language pronunciation as a motor skill that most learners cannot develop solely through self-evaluation of their production. Teachers play a crucial role by giving feedback on learners' performance as part of their training in using articulatory organs (tongue, jaw, lips, etc.) that produce speech sounds (Dona et al., 2024).
5. **Metode Cermin** This method involves students observing themselves in a mirror while producing specific sounds. It enables them to visualize the correct positioning of the mouth, tongue, and lips. This technique is particularly effective for sounds like /h/ and /ʔ/, which require precise control of articulatory placement. The articulatory approach supports this method by emphasizing the importance of training the movement of articulatory tools to produce accurate speech sounds (Maro, 2018).

Although phonics practice offers many benefits, its implementation is not without challenges. One of the main obstacles is the limited instructional time in classroom settings. Moreover, students with phonological disorders often require highly individualized approaches, which can be difficult to apply in large groups (Basuki, 2018).

Teachers must also recognize that the success of phonetic training depends on consistency and patience. Familiarizing students with new sounds takes time, and it is

crucial to create a supportive learning environment where students do not feel pressured.

Individual Intervention

In learning Arabic, which is characterized by complex phonetic elements, individual intervention is essential to help students understand and produce correct sounds. The goal of individual intervention is to provide greater attention to students, adapt learning to their specific needs, and reduce the likelihood of phonological errors.

Individual intervention is an approach that emphasizes tailored support based on the specific needs of students. This approach typically involves giving students more time to practice, providing detailed feedback, and designing more structured and targeted activities. According to Sarwono (2016), individual intervention enables students to learn at their own pace and according to their preferred learning style, thereby enhancing their understanding and skills in specific areas.

In the context of phonological disorders, individual intervention focuses on identifying and practicing specific sounds that are often problematic for students. For instance, in Arabic, certain phonemes not present in the Indonesian language—such as the letters /ع/ (‘ayn) or /ق/ (qāf)—may pose difficulties for students with phonological disorders. Through individual intervention, students are given the opportunity to practice and understand these sounds more intensively and systematically.

Strategies for individual intervention in Arabic language learning include:

1. **Identifying Student Needs**, The first step in individual intervention is identifying students’ needs. Teachers must be able to determine which phonological aspects pose challenges for the student. This can be achieved through phonological assessments or direct observation of students’ pronunciation skills. According to Arief (2020), accurate identification is crucial so that the intervention provided aligns with the student’s specific problems.
2. **Providing Phonological Exercises**, After identifying the phonological problems faced by the student, the teacher can implement appropriate phonological exercises. According to Rahmat (2019), regular phonological practice can help students improve their ability to produce accurate sounds. These exercises may include repetition of sounds, simplification of difficult phonemes, and

pronunciation practice of words in sentence contexts. Repetition is important to reinforce the student's mastery of the target phonemes.

3. **Utilizing Instructional Media**, The use of varied instructional media is important in individual interventions. In Arabic learning, useful media may include voice recordings, language learning applications, or interactive videos that demonstrate correct pronunciation. Sarwono (2016) explains that engaging media can motivate students to focus and participate more actively in phonological training.
4. **Providing Feedback and Correction**, A key component of individual intervention is providing constructive feedback. Teachers should deliver feedback in a positive manner and guide students to improve their pronunciation. The feedback should be specific—for example, correcting the pronunciation of a particular letter—so that students can identify their mistakes and make the necessary corrections.
5. **Applying a Multisensory Approach**, A multisensory approach integrates multiple sensory channels in the learning process. For example, students can listen to correct sounds, observe mouth movements while pronouncing certain sounds, and physically feel the articulation by touching areas of the mouth or throat.

   Multisensory approaches in language learning have shown significant results in improving phonological skills among students with phonological disorders. A study by multisensori dalam pembelajaran bahasa telah menunjukkan hasil yang signifikan dalam memperbaiki kemampuan fonologis siswa dengan gangguan fonologis. A study oleh (R. C., Barton, M. L., & Pressley, 2022) found that multisensory strategies—such as visual-auditory and kinesthetic training—significantly enhanced phonological awareness and decoding skills in children with phonological disorders compared to a control group. These results suggest that simultaneous engagement of multiple senses strengthens phonological processing.. According to Anwar (2017), using a multisensory approach in phonological instruction can enhance students' understanding and skills more holistically.

An effective individual intervention model for students with phonological disorders in Arabic language learning must be flexible and adaptive. One applicable model is the constructivist-based instructional model, in which teachers guide students to build their phonological understanding through direct experience and reflection. This model gives students the opportunity to take an active role in the learning process, discover their own methods for producing difficult sounds, and self-correct errors.

In addition, the model integrates collaboration between students and teachers, with the teacher serving as a facilitator who provides support and direction at each step of the learning process. This aligns with the views of (Fauzi & Rahmawati, 2025) who emphasize the teacher's role as a mentor in supporting individual intervention efforts.

Evaluation and monitoring are important components of individual intervention. Each intervention session should be evaluated to determine whether students have made progress in addressing their phonological difficulties. Evaluation may include tests or observations of students' pronunciation of phonemes. Monitoring can also assess students' motivation and confidence in using Arabic after the intervention. According to (Salabi, 2020), regular evaluations allow teachers to adjust their teaching strategies in accordance with the student's development.

The four strategies discussed can be implemented in an integrated manner for optimal outcomes. Multisensory approaches and phonetic exercises are mutually reinforcing—one stimulates sensory perception, while the other enhances articulatory production. Audio-visual technology provides engaging and interactive media, while individualized interventions ensure that instruction is tailored to the specific needs of each learner.

However, each strategy also has its limitations. Phonetic-based instruction requires intensive teacher training, while the use of technology demands adequate infrastructure and sufficient digital literacy. Therefore, it is essential to establish synergy between the instructional approaches, available resources, and teacher competence. This integration will ensure that Arabic language instruction becomes more inclusive and accessible for students with phonological disorders.

CONCLUSION

Phonological disorders do not necessarily constitute an absolute barrier to learning Arabic, provided that instructional approaches are tailored to the individual

needs of learners. Based on the synthesis of the literature, four strategies have emerged as potentially effective in enhancing students' phonological abilities: the multisensory approach, audio-visual technology, phonetic exercises, and individualized intervention.

The multisensory approach enables students to access learning materials through various sensory channels, helping to strengthen the association between sounds and written symbols. Audio-visual technologies offer more interactive learning alternatives, allowing students to engage with pronunciation drills and auditory reinforcement independently. Phonetic training emphasizes articulatory clarity through repetition and gradual sound recognition. Meanwhile, individualized interventions facilitate the customization of instructional strategies to align with each student's unique needs and capacities.

The findings underscore the importance of developing adaptive instructional designs that account for the diversity of learner profiles and are supported by teachers' competence in applying these strategies contextually. The integration of appropriate media and technologies, teacher training, and individualized assessment are key components in supporting Arabic language learning for students with phonological disorders.

The limitations of this study stem from its reliance on literature review, which does not provide direct insights into classroom implementation. Moreover, much of the analyzed literature is based on specific contexts and age groups, suggesting the need for further validation across different educational settings.

Future research is encouraged to empirically examine the effectiveness of these strategies across various educational levels, socio-cultural contexts, and degrees of phonological impairment. Further exploration into the development of specialized instructional media and teacher training programs for addressing the needs of students with learning difficulties is also recommended. By synthesizing these findings, this study aims to offer a foundational contribution to the development of inclusive and responsive Arabic language teaching models that accommodate diverse learner needs.

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