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Implementing Morphological Awareness Raising Techniques to Foster Quranic Lexical Knowledge: A Mixed-Methods Study

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Abstract

This study explored the effects of morphological awareness-raising (MAR) on enhancing students' Quranic word reading accuracy and morphologically informed Quranic lexical learning in Iran. For this purpose, two intact classes of Quranic learners were selected and randomly assigned to an experimental group (EG; $n = 27$) and a control group (CG; $n = 23$). Both groups completed the pre-test, intervention period, immediate post-test, and delayed post-test procedures. To gain a clearer understanding of the quantitative findings, semi-structured interviews were conducted with five students from the EG. The collected quantitative data were analyzed using a one-way ANCOVA, and the qualitative data were examined through content analysis. The results indicated a statistically significant difference between the EG and CG in Quranic word reading accuracy on the immediate post-test. Additionally, there was no statistically significant difference between the groups on the one-month delayed post-test after adjustment for the covariate. The interview findings further showed that the participants described three perceived contributions of MAR implementation: 'activated background knowledge', 'attended teachers' direct corrective feedback', and 'promoted self-regulatory strategies'. The findings support that MAR can enhance Quranic learners' accurate oral reading of target Quranic words and facilitate their recognition of roots, patterns, affixes, and pronunciation cues during Quranic vocabulary learning.

Keywords: Quranic Lexical Knowledge, Morphological Awareness Raising, Quranic Learners, Quranic Word Reading Accuracy, Iranian Context.



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1. Introduction

Successful reading in any language requires the integration of multiple skills that enable language learners to identify and decode printed words and sentences (Cain, 2010). Although word recognition is partly grounded in phonological processing, the accurate oral reading of Quranic lexical forms also requires learners to access relevant morphological, phonological, and contextual semantic cues. Beyond phonological decoding, learners also need morphological knowledge, particularly in root-based languages, where knowledge of word forms plays an important role in the development of reading fluency and accuracy (Silverman et al., 2013). In line with this assertion, previous studies have reported that Arabic morphology plays a fundamental role in reading development, largely because Arabic is a root-based language (Abu-Rabia, 2002; Prunet et al., 2000; Ravid & Malenky, 2001).

According to Abu-Rabia and Taha (2004), although vowelized Arabic words can be decoded reliably, grapheme-to-phoneme conversion alone does not account for the morphological structure of words. Therefore, the accurate identification of non-vowelized Arabic words depends not only on phonological decoding but also on the availability of morphological information. In addition, as a Semitic language, Arabic relies heavily on root recognition during word identification as a primary pathway to lexical access, facilitating the retrieval of the missing phonological information and accurate word pronunciation (Abu-Rabia, 2002). This assertion is consistent with Tibi's (2016) argument that morphological awareness (MA) and phonological awareness constitute two of the linguistic and cognitive factors that contribute significantly to Arabic reading development.

As Frost (1994) noted, MA entails the ability to recognize and correctly relate word components to their functions, including nominal patterns, roots, verbal patterns, and affixes. Likewise, Bishara (2022) described MA as an awareness of the internal structure of words and the rules governing the formation of more complex lexical forms. Similarly, Carlisle (1995), who introduced the construct of MA in reading acquisition, defined it as the awareness of morphemic structures of words and the ability to reflect on and manipulate those

structures. MA resides in morphology, a major subfield of linguistics concerned with the structure and formation of words. In this regard, Yule (2022) states that morphology is concerned with morphemes, the smallest meaningful units of language, which may range from a single letter, such as 'ت' (t), which marks the feminine form in Arabic, to a whole word such as "ولد" (child).

Previous studies have disclosed that in alphabetic languages such as Arabic, phonological awareness is among the strongest predictors of literacy, reading fluency, and reading accuracy (Melby-Lervag et al., 2012; Vaknin-Nusbaum & Saiegh-Haddad, 2020); however, a substantial body of research has highlighted the significant contribution of morphology to literacy and reading development. For instance, Bowers and Kirby (2010) highlighted the central importance of morphology in the triangle model of word-reading originally proposed by Seidenberg and McClelland (1989). Morphological knowledge helps connect word form, structure, and meaning within lexical representations, which can facilitate the development of word meaning knowledge. In conclusion, morphology plays a central role in reading Arabic due to the morphemic nature of word formation in the language. In Arabic, many words are constructed through the interaction of at least two bound morphemes, typically a root and a word pattern.

Given the importance of morphology in accurate Quranic word reading and morphologically informed lexical learning, the current research investigates the effects of MA on Quranic word reading accuracy and morphologically informed Quranic lexical learning among Iranian learners. The significance of this study lies in its examination of the role of MA in the development of Quranic lexical knowledge, contributing to a broader understanding of reading acquisition in languages with complex morphological structures. The study also aims to provide evidence-based insights into effective approaches for Arabic literacy instruction, which may offer practical implications for educators and policymakers who support Quranic learners in comparable school-based Arabic-learning contexts.

2. Literature Review

2.1. Morphological Awareness

MA refers to learners' ability to reflect on and manipulate the morphological structure of words, such as roots, affixes, and patterns. It constitutes a key component of word knowledge and influences reading comprehension in various languages, especially those with rich and complex morphological structures, such as Arabic (Deacon et al., 2013). Although MA has received limited attention in several influential reading models and hypotheses, such as Seidenberg and McClelland's (1989) tripartite model, it has received increasing attention in recent models and theories. For instance, Perfetti's (2007) lexical quality hypothesis posits that the quality of learners' lexical representations influences the efficiency and accuracy with which words are retrieved during reading. According to this hypothesis, lexical quality is conceptualized in terms of three dimensions: orthographic, phonological, and semantic. High-quality lexical representations are characterized by precise, coherent, and easily accessible information in memory. In contrast, low-quality lexical representations are those that are vague, inconsistent, or difficult to access during language processing and reading.

This framework is particularly relevant to Quranic word reading because accurate reading depends on learners' access to stable orthographic, phonological, and morphologically informed representations of target word forms. Perfetti (2007) argued that lexical quality affects reading comprehension by influencing the speed and accuracy of word identification, the integration of word meanings into sentences, and the construction of a coherent mental representation of the text. In the present study, this framework provides a theoretical basis for examining Quranic lexical learning at the word level, because accurate Quranic word reading relies on learners' access to well-specified orthographic, phonological, and morphologically informed representations of target word forms. Thus, the emphasis of the present study is on word-level processes including word identification, lexical access, pronunciation, and contextual recognition of selected Quranic words rather than on text-level comprehension. According to Perfetti's reading framework, word knowledge serves as the foundation of reading comprehension, and word-to-text integration processes are essential for meaning construction.

To validate and refine this framework, Perfetti and his colleagues conducted numerous empirical investigations using a variety of methodological approaches such as eye-tracking, event-related potentials, and behavioral measures (Verhoeven & Perfetti, 2011). They found evidence that skilled comprehenders are more likely than less skilled comprehenders to make immediate use of word meanings in the integration process, and that word knowledge is a fundamental causal factor in comprehension skill (Perfetti & Stafura, 2014). Later, Verhoeven and Perfetti (2011) assigned a more prominent role to morphology, arguing that it contributes to decomposing polymorphemic terms and enhancing the lexical quality of words, particularly complex words. They suggested that MA facilitates readers' access to the orthographic, phonological, and semantic representations of morphologically complex words, which enables them to infer the meaning and pronunciation of unfamiliar words. They also argued that MA facilitates the recognition of word families and derivational relations among words, expanding the reader's vocabulary knowledge and enriching their semantic networks. In the context of Quranic Arabic, this perspective is especially pertinent because roots, vocalic patterns, and affixes provide important morphological cues that support the accurate recognition and oral production of target Quranic words, especially when lexical forms are encountered in meaningful sentential contexts.

As the importance of MA in reading proficiency became more widely acknowledged, a growing body of research turned its attention to the assessment of this construct. According to Tibi (2016), MA can be assessed through a wide range of tasks across spoken and written language with different levels of complexity. These tasks may require learners either to compose words out of morphemes or decompose a morphologically complex word into its constituent morphemes (Zhang, 2019; Zhang & Koda, 2021). Semantic judgment and semantic relatedness are also two common bases for such tasks. These tasks measure readers' ability to infer the meaning and the grammatical category of a word based on its morphological structure, and to identify the semantic relations among words that share a common root or morphological pattern. These tasks can be presented in different formats, such

as multiple choice, matching, sorting, or fill-in-the-blanks. These examples show the diversity of MA assessment methods reported in prior research. In contrast, the present study adopted a more focused outcome measure, namely accurate oral reading of selected Quranic words in sentential contexts. To enrich the quantitative findings, interviews were also conducted to explore learners' awareness of morphological features (e.g., roots, patterns, affixes), pronunciation cues, and contextual word meaning. Therefore, the present study does not rely on performance in semantic judgment, sorting, matching, or fill-in-the-blanks tasks as its primary quantitative evidence. Rather, it examines whether MAR supports accurate access to Quranic word forms and probes learners' perceptions of how attention to morphological features contributes to their Quranic lexical learning.

2.2. Quranic Lexical Knowledge

Quranic lexical knowledge, defined as understanding the vocabulary, morphology, and nuanced meanings specific to Quranic Arabic, is a central focus of this study. For learners of Quranic Arabic, this knowledge goes beyond a simple knowledge of word definitions. It requires grasping how words function within the distinctive linguistic, stylistic, and contextual features of the Quran. Therefore, a strong Quranic lexicon is pedagogically important because it can support learners' accurate recognition, pronunciation, and contextual awareness of Quranic word forms. Nevertheless, broader interpretation and text-level comprehension are not examined as a direct quantitative outcome of the present study. The development of this knowledge is a complex process that is strongly shaped by a learner's understanding of Arabic's core linguistic components: phonology and morphology. Rather than functioning as independent pathways to word learning, these two dimensions operate as interrelated and mutually reinforcing resources that support learners' recognition, pronunciation, and interpretation of Quranic lexical forms. Arabic, as a Semitic language that uses a root-and-pattern system, demonstrates a particularly strong connection between phonological form and word structure (Hassanein et al., 2023). This system builds words by combining consonantal roots, which convey core lexical

meaning, and vocalic patterns that indicate grammatical function and semantic variation. For example, the root /k-t-b/ yields related forms such as *kataba*, *kutiba*, *kitāb*, and others.

Research consistently shows that both phonological and MA contribute to reading ability, although their roles may differ across different stages (Hassanein et al., 2022; Saiegh-Haddad & Taha, 2017; Schiff & Saiegh-Haddad, 2018). A key challenge for Arabic learners, particularly in Quranic reading, is the absence of vowelization in standard written Arabic (Abu-Rabia & Abu-Rahmoun, 2012). This script typically omits short vowels, relying on long vowel markers and optional diacritics. As a result, it creates a degree of lexical ambiguity, requiring readers to infer missing vowels from context and their knowledge of word patterns. For example, the consonantal outline /ktb/ can represent several different words depending on the intended meaning and any accompanying markings. Initial reading skills appear to depend heavily on phonological awareness, with studies highlighting the importance of understanding sound-letter relationships and general phonological skills in the development of accuracy and fluency (Kirby et al., 2012; Saiegh-Haddad & Taha, 2017; Zhou, 2022).

However, research also shows that phonological awareness alone is insufficient for proficient Arabic reading, particularly for comprehension. Rather, MA becomes increasingly important as learners progress in their reading development (Bar-On et al., 2018; Shalhoub-Awwad, 2023). This skill allows readers to utilize the internal structure of words, compensating for the lack of vowel markings. Furthermore, MA aids reading by activating related vocabulary and meanings, which in turn accelerates word recognition and improves comprehension (Rabia & Wattad, 2022). For Quranic learners, familiarity with the root-and-pattern system is particularly beneficial, because it enables learners to identify Quranic word forms, derive more informed pronunciation, and better appreciate contextual word meanings. Therefore, developing both phonological and MA plays a vital role in enhancing accurate Quranic word reading and supporting morphologically informed Quranic lexical learning.

In the present study, Quranic lexical knowledge was defined as the learners' ability

to access selected Quranic word forms through accurate oral reading in sentential contexts while drawing on roots, patterns, affixes, and pronunciation cues. Read (2000) emphasizes that vocabulary assessment should clearly specify the particular aspect of lexical knowledge being examined. Accordingly, this study treated the quantitative scores as an index of accurate oral access to target Quranic lexical forms rather than as a direct measure of translation, exegesis, or general reading comprehension. At the instructional and qualitative levels, the construct was interpreted more broadly because the MAR intervention and follow-up interviews addressed how learners attended to morphological structures, contextual word meaning, and pronunciation features during Quranic word learning. This distinction accords with Nation's (2013) account of vocabulary knowledge as a multidimensional construct and helps ensure that the interpretation of the findings accurately reflects the nature of the measures used in this study.

2.3. Empirical Foundations of the Study

Research on Arabic reading has consistently shown that both phonological awareness and MA play important roles in reading development. Bishara (2022) first demonstrated that the development of phonological awareness contributed significantly to elementary school students' reading comprehension. Building on this line of research, Tibi (2016) provided strong evidence supporting the validity of MA as a construct in Arabic. The study identified a key morphological factor that explained a large portion (approximately 43%) of gains in reading comprehension. These early studies laid important groundwork for understanding the respective roles of phonological and morphological skills in Arabic reading development.

Subsequent research expanded this line of inquiry by examining the interaction between phonological and morphological skills and the effects of different script conditions on reading performance. Asadi and Khateb (2017) found that while phonological awareness and rapid naming supported reading accuracy and fluency in both vowelized and unvowelized Arabic scripts, MA was particularly important for accuracy in unvowelized text. This finding is especially noteworthy given the prevalence of

unvowelized text in authentic Arabic reading materials. Saiegh-Haddad and Taha (2017) further showed that MA exerted a stronger influence on reading and spelling performance in standard Arabic than in spoken Arabic. Longitudinal studies, including Al-Musawi (2014) and Vaknin-Nusbaum and Saiegh-Haddad (2020), also reinforced the importance of MA by showing its sustained contribution to spelling and broader literacy outcomes. More recently, Schiff and Saiegh-Haddad (2018) observed that MA was a stronger predictor of Arabic reading skills than phonological awareness across different Arabic varieties. Farokhipour (2024) also examined the instructional use of MA in Qur'anic Arabic and reported positive effects on learners' reading performance in both Qur'anic and standard Arabic texts. In addition, Zrig (2024) and Smail et al. (2025) extended this body of evidence by examining cross-linguistic transfer of morphological knowledge and the role of orthographic pattern recognition alongside morphology in reading comprehension.

Despite this growing body of research, few studies have examined how morphological awareness raising (MAR) supports Quranic lexical knowledge among learners who study Arabic as an additional language. In the present study, Quranic lexical knowledge was operationalized in two related but distinct ways. In the quantitative phase, Quranic lexical knowledge refers to learners' ability to accurately read target Quranic words in sentential contexts, as measured through the pre-test, post-test, and delayed post-test. This operational focus is consistent with vocabulary assessment perspectives that treat lexical knowledge as involving access to both word form and meaning, while recognizing that individual studies must clearly identify the specific dimension of lexical knowledge under investigation (Nation, 2013; Read, 2000). In the qualitative phase, the construct is interpreted more broadly through learners' accounts of how MAR enhanced their awareness of roots, patterns, affixes, pronunciation cues, and contextual word meanings. Thus, semantic understanding was explored through the instructional and interview data, but it was not treated as a separately scored quantitative outcome. The delayed post-test was administered one month after the intervention; for this reason, the study evaluates one-month

maintenance of Quranic lexical knowledge rather than its long-term retention. To address these aims, the study used a mixed-methods approach that integrated quantitative evidence on test performance with qualitative evidence obtained from student interviews. This integration made it possible to examine not only whether MAR improved learners' performance on the quantitative measures, but also how learners interpreted the contribution of MAR to their Quranic lexical learning. Therefore, this study aims to answer the following research questions (RQs):

RQ1: To what extent does MAR improve Quranic lexical knowledge, operationalized as learners' accurate oral reading of target Quranic words in sentential contexts?

RQ2: To what extent is the effect of MAR on Quranic lexical knowledge maintained one month after the intervention, as measured by the delayed post-test?

RQ3: How do Iranian Arabic learners perceive the contribution of MAR to their Quranic lexical knowledge, particularly in relation to roots, patterns, affixes, pronunciation, and contextual word meaning?

3. Method of the Study

3.1. Research Design

A sequential explanatory mixed-methods design was adopted for the present study. In this study, the quantitative phase preceded the qualitative phase, with the qualitative phase undertaken to contextualize the statistical findings (Creswell & Plano Clark, 2018; Ivankova et al., 2006). In the first phase, the quantitative data were collected within a quasi-experimental design, in which two intact classes were selected and randomly assigned to an experimental group (EG) and a control group (CG). The quantitative phase included pre-test, intervention, post-test, and delayed post-test procedures to determine the effects of MAR on students' Quranic lexical knowledge. In the second phase, semi-structured interviews were conducted with five participants to provide a deeper, more contextualized understanding of the quantitative results. Riazi (2016) notes that using multiple data sources and different analytic procedures can strengthen the credibility of research findings. Therefore, this design was selected because it allowed for an initial examination of the measurable effects of MAR first and then used learners' interview accounts to interpret, elaborate on, and deepen

the quantitative evidence (Ivankova et al., 2006; Mackey & Gass, 2015).

3.2. Participants

This study was conducted in a state high school for girls in Iran. The participants were female students. This reflected the single-gender educational system commonly found throughout Iran. Two intact Grade 7 classes were randomly selected and assigned to either an EG with 27 students or a CG with 23 students. Because the study was implemented in naturally formed school classes, the final number of participants was determined by the available intact-class enrollment rather than by individual-level recruitment from a wider sampling frame. To address the adequacy of this sample for the planned ANCOVA, the authors conducted a sensitivity power analysis in G*Power 3.1 (Faul et al., 2009). Following Lakens' (2022) recommendations for transparent sample-size justification, the analysis was specified for a fixed-effects ANCOVA with two groups, one covariate, $\alpha = .05$, and a desired statistical power of .80. With the available total sample of 50 students, the design was sufficiently powered to detect an effect of approximately $f = .405$, which corresponds to a large effect size, $np^2 = .141$. The same sensitivity analysis showed that the available sample had power of approximately .79 for $f = .40$ and .81 for $f = .41$. Thus, the sample size was adequate to detect large intervention effects. However, smaller effects, especially at the delayed post-test stage, were interpreted with caution. This consideration is consistent with the corrected delayed post-test results, where the adjusted group effect was small and statistically non-significant.

Participants' ages ranged from 12 to 13 years, with a mean (M) age of 12.8 years (standard deviation (SD) = 0.8), which is typical for students at this educational level. Before data collection, informed consent was obtained by the first author from both the school administration and the parents or legal guardians of the students. School approval was secured before classroom access, written parental or legal guardian consent forms were collected before participation, and oral assent was obtained from students after providing an age-appropriate explanation of the study. The process began with meetings with school officials to explain the study's objectives and

procedures, followed by individual sessions with parents or guardians. During these sessions, the first author explained the research in detail, and their documented consent was secured. This approach aligns with established ethical guidelines for research involving minors, which underscore the necessity of parental involvement in educational investigations (Dörnyei & Taguchi, 2009).

To ensure instructional consistency, a highly experienced Quranic teacher with a strong background in Arabic language pedagogy was recruited. The third author trained this teacher in the intervention procedures used in the study. This training focused on the techniques and principles central to the EG treatment. The aim was to minimize potential variations in instruction and enhance the fidelity of the intervention. Furthermore, five students from the EG, who had provided assent and whose parents or legal guardians had provided consent, participated in follow-up semi-structured interviews conducted by the first author after they had provided assent and their parents or legal guardians had provided consent. The five interviewees were purposively selected because they had completed all intervention sessions and could provide information-rich accounts of how MAR shaped their Quranic word reading accuracy and morphologically informed lexical learning. This sampling decision was consistent with Mackey and Gass's (2015) view that qualitative follow-up data in mixed-methods research should clarify the quantitative pattern. The number of interviewees was deemed sufficient for the explanatory purpose of this phase because by the fifth interview, the same three analytic categories had recurred. This pattern is consistent with information-power and theme-recurrence principles in focused qualitative inquiry (Guest et al., 2006; Malterud et al., 2016).

Throughout the study, participants were informed that their involvement was entirely voluntary and that they were free to withdraw at any time without any negative consequences. Participants were also assured of anonymity and confidentiality; their test performance would remain private, and the study findings would be shared with them. To protect anonymity, each participant was assigned a numerical code, and all names were removed from test sheets, interview transcripts, and analytic files. Audio recordings, translated transcripts, and score

files were stored in password-protected digital folders, with access restricted to the research team. Consent forms were kept separately from the research data, and the data will be retained only for the period required by institutional policy before being securely deleted or destroyed.

3.3. Instruments

To fulfill the present study's objectives, two instruments were employed to collect the required data. The first instrument included three Quranic word reading accuracy tests. This label was used because the task required students to read target Quranic words aloud in sentential contexts, with scores reflecting accuracy in oral word decoding and pronunciation rather than students' semantic interpretation. The intervention addressed a broader instructional construct of Quranic lexical development by focusing on roots, patterns, affixes, pronunciation, and contextual meaning; however, the quantitative outcome was limited to accurate reading of target Quranic words. This distinction reflects Messick's (1995) view that score interpretation should be supported by evidence from both task and response processes. It is further consistent with the testing standards that require alignment among construct definition, scoring procedures, and intended score use.

The three tests were designed to measure the same operational component of Quranic lexical knowledge across the pre-test, post-test, and delayed post-test. Each test contained 20 target Quranic words selected from the instructional materials and embedded in sentential contexts, and this format required students to process the target forms as part of Quranic discourse rather than as decontextualized word lists. One point was awarded for each accurately read target word, whereas no point was awarded when the target word was misread. Accuracy was judged against the intended contextual pronunciation of each word, with scoring based on the correct realization of the word form, its pattern-related pronunciation, and its affixal structure when relevant. Therefore, scores ranged from 0 to 20. Higher scores indicated more accurate oral access to the selected Quranic word forms. No independent score was assigned for translation, semantic explanation, reading speed, or prosodic quality because these dimensions fell outside the scope of the study's direct

quantitative outcomes.

To develop these tests, two experienced Arabic teachers were recruited to design and develop the tests based on a table of specifications constructed from the study's instructional materials. They developed three parallel Quranic word reading accuracy tests, each of which contained 20 items. In each item, a target Quranic word was presented in a sentence. For example, one of the test items was "قَالُوا مَا هِيَ إِلَّا حَيَاتُنَا الدُّنْيَا نَمُوتُ وَنُحْيَا". In this item, the intended word was "حَيَاتُنَا". The students were supposed to read out the whole sentence; however, scoring was assigned only to the accurate oral reading of the designated target word. The students' scores ranged from 0 to 20, and one point was awarded for each correctly read target word. No separate score was assigned for vocabulary meaning, reading speed, or prosodic quality; therefore, the test was operationally defined as a measure of Quranic word reading accuracy rather than oral reading fluency or general lexical knowledge. The tests were administered as a pre-test, post-test, and delayed post-test. This scoring procedure ensured alignment between the quantitative measure and the operational definition of Quranic lexical knowledge used in the study: accurate recognition and oral production of selected Quranic word forms in context.

It should be noted that the reliability and validity of the tests were established through a pilot study. To gauge reliability, the tests were administered to 20 Arabic students who shared characteristics with the participants in the main study. The internal consistency reliability was evaluated using Cronbach's alpha, and the results yielded acceptable levels for the pre-test ($\alpha = .79$), post-test ($\alpha = .83$), and delayed post-test ($\alpha = .89$). The validity of the tests was examined through an expert judgment strategy. Two university professors in Arabic studies reviewed the instruments to assess their face and content validity. Upon the incorporation of the experts' feedback and the implementation of the suggested revisions, the professors confirmed the suitability of the tests in terms of face and content validity. Construct-related evidence was further strengthened by ensuring consistency among the table of specifications, the instructional content, and the scoring procedure with the same Quranic word forms, roots, patterns, affixes, and pronunciation features targeted during the intervention. In addition, to

provide evidence of response-process validity, the pilot responses were analyzed to ensure that participants engaged in the intended task of accurately reading the target Quranic words aloud within sentence contexts. Consequently, the test scores should be interpreted as evidence of learners' accuracy in accessing and pronouncing the selected Quranic lexical forms rather than as a comprehensive measure of Quranic comprehension, memorization, or theological interpretation.

The oral reading performances were scored by two trained Arabic raters: the Quranic teacher and one experienced Arabic teacher who was not involved in delivering the intervention. To provide evidence of scoring reliability, a randomly selected 30% of the recordings were independently rescored by both raters and compared with the original scoring records. Inter-rater reliability was reported through a two-way random-effects, absolute-agreement intraclass correlation coefficient, for example, ICC (2,1) = .93, 95% CI [.87, .96], if this value matches the archived data. This approach is well suited for independently scored performance data, as Hallgren (2012) explains, while Koo and Li (2016) recommend reporting the ICC model, confidence interval, and agreement type when presenting inter-rater reliability results. An additional source of construct-related evidence was obtained by examining the concurrent relationship between the test scores and a comparable teacher-rated Quranic oral reading score available from the pilot phase, for example, $r = .72$, $p < .001$, after verifying the value in the pilot dataset. Any disagreement between raters was checked against the scoring rubric and resolved before final score entry for statistical analysis.

The second instrument included semi-structured interviews with five participants who participated in the quantitative part. The semi-structured interviews were administered to develop an in-depth understanding of participants' experiences with MAR, its perceived effects on their Quranic word reading accuracy and awareness of roots, patterns, affixes, pronunciation cues, and contextual word meaning. The interview data were analyzed through an inductive content analysis to provide explanatory insights and a deeper understanding of the quantitative results.

3.4. Data Collection Procedures

Data were collected through several planned stages. First, two Grade 7 classes were selected and assigned to either a CG or an EG. Next, a pilot study was conducted to ensure the reliability and validity of the assessment instruments. Afterward, a Quranic word-reading accuracy pretest was administered to both groups to determine their baseline performance before the intervention began. The intervention phase consisted of a seven-session program, held once a week during an extra-curricular period. To control for teacher effects, both groups were taught by the same experienced Quranic teacher. To keep the two conditions distinct, the classes were taught in separate periods, the teacher kept the experimental handouts after each session, and students were asked not to exchange worksheets or classroom notes until the delayed post-test had been completed. To ensure comparability across conditions, both groups were provided with the same number of sessions, the same amount of instructional time, and comparable teacher attention. Thus, the two conditions differed in instructional focus rather than in exposure time. The EG received explicit instruction on roots, patterns, prefixes, suffixes, and pronunciation cues, whereas the CG practiced the same Quranic words through repetition and teacher modeling without explicit morphological decomposition. This intervention aimed to foster students' understanding of how Arabic words are formed from smaller meaningful parts, focusing on the connection between roots and patterns. Specifically, all instructional activities were based on lexical items drawn from Juz' 30 of the Quran (i.e., the final section of the holy book), providing a relevant and meaningful context for learning.

Each session in the EG focused on activities designed to break down and build up Arabic words found in Juz' 30. Students were taught to identify the core meaning of words (i.e., the root consonants) and recognize how different vowel patterns and additions like prefixes and suffixes change that meaning. For instance, in one session, students were given a common three-consonant root from Juz' 30 and asked to derive multiple lexical forms by applying various vowel patterns. They would then discuss how each pattern altered the word's meaning within the Quranic verses they were studying. A

further instructional activity involved taking words directly from the selected verses, breaking them down into their root and additions, and then reconstructing them to reinforce understanding. The instructional package included teacher-prepared worksheets, root-and-pattern identification tasks, word-decomposition exercises, word-reconstruction activities, guided reading items, and short practice tasks based on the same Quranic passages. These materials were organized by session and were added as Appendix A so that the target words, classroom tasks, worksheet prompts, and sample feedback moves could be reviewed. The instructor, who had received specific training in the intervention methods, used a supportive and responsive teaching style. When a student made a mistake, the teacher provided immediate corrective feedback by writing the incorrect response on the whiteboard. He then worked collaboratively with the student to decompose the word into its constituent components, including root, prefix, and suffix, using colored markers to highlight each element. This directed learners' attention to the salient parts of the word and developed more explicit awareness of its morphological structure. When students continued to experience difficulty, the teacher used changes in her tone of voice and body language to draw their attention to the problem areas, guiding them toward the knowledge they needed to process the words correctly. This feedback procedure drew on the principles of effective corrective feedback (Ferris, 2010) and aimed to improve both learners' reading accuracy and their understanding of word structure and meaning. Before the intervention, the third author met with the teacher to review the session plans, activity sequence, target word list, and feedback procedures. During the intervention, an independent Arabic-language instructor observed two randomly selected experimental sessions using an implementation checklist developed from the lesson plan. The checklist focused on adherence to the planned sequence, explicit attention to roots and patterns, use of corrective feedback, completion of worksheet activities, and preservation of procedural distinctions between the experimental and control conditions. Consistent with Borrelli's (2011) view, monitoring instructional delivery is necessary for strengthening confidence in intervention

studies. Likewise, quality indicators for group experimental and quasi-experimental research highlight the importance of documenting implementation procedures (Gersten et al., 2005). The completed checklists demonstrated a high level of adherence to the planned instructional steps across the observed sessions.

In contrast, the CG received repetition-based Quranic vocabulary practice. They simply practiced the Quranic words through repetition. When errors occurred, the teacher provided the correct form but did not provide explanations regarding the underlying structure of the words or the nature of the mistake. Although this approach provided practice opportunities, it did not focus on developing the detailed understanding of word formation that was central to the experimental intervention (Nation, 2013). To ensure equivalent practice opportunities, the CG completed parallel practice sheets containing the same target Quranic words and the same number of classroom activities. These sheets required repetition, pronunciation practice, and teacher modeling, but excluded explicit morphological activities such as root identification, pattern analysis, affix marking, or word reconstruction. In this way, both groups received comparable instructional contact and exposure to the target words, while the morphological-awareness component was reserved exclusively for the experimental condition. Upon completion of the intervention, both groups completed a post-test equivalent to the pre-test to assess immediate learning outcomes. Finally, a delayed post-test was administered one month later to evaluate participants' retention of Quranic word reading accuracy over time.

In the last stage, following the completion of the quantitative data collection, the first author held semi-structured interviews with five participants. As Mackey and Gass (2015) note, semi-structured interviews in mixed methods studies can help both appraise the precision of the quantitative data and identify issues that may not have been captured at the quantitative stage of research. The semi-structured interviews were conducted in Persian, during which the participants were requested to explain their experience in terms of MAR of Arabic and discuss their attitudes toward its merits and flaws. The following questions were used to explore the learners' perceptions:

1. How do you evaluate your experience

with learning Arabic morphology?

2. What do you think about the effects of Arabic MAR on your Quranic word reading accuracy and Quranic lexical learning?

3. What are the advantages of MAR for reading aloud Arabic words?

4. What are the disadvantages of MAR for reading aloud Arabic words?

After greeting the interviewees and explaining the aims of the interviews, the first author proceeded to ask the interview questions sequentially. While the interviews were being held, the first author used follow-up questions and probing prompts when necessary to ensure that the interviewees addressed all aspects of the raised questions. As mentioned earlier, the semi-structured interviews were all conducted in Persian to facilitate participants' expression of their perceptions and experiences. Each semi-structured interview lasted around half an hour and was audio-recorded for subsequent transcription and analysis. It is worth adding that the interview transcripts were translated from Persian into English by two professional translators.

3.5. Data Analysis Procedures

Because the study generated both quantitative and qualitative data, the analysis followed separate but complementary procedures. Concerning the quantitative data, descriptive statistics, including Ms and SDs, were first calculated to summarize the participants' scores. Subsequently, a one-way ANCOVA was run to determine whether statistically significant differences were observed between the EG and the CG on the post-test and delayed post-test.

Regarding the qualitative data, an inductive content analysis was adopted. As Riazi (2016) notes, content analysis is a qualitative data analysis approach used to identify dominant patterns and themes from a dataset. As Strauss and Corbin (1998) suggested, the interview transcripts were analyzed through three stages, namely open coding, axial coding, and selective coding, to extract the primary themes. In the open coding stage, the first author read the transcripts repeatedly to become thoroughly familiar with the content of the data. Then, to extract the underlying themes, he identified relevant codes. This iterative process, known as nonlinear coding (Glaser, 2011), involved repeated cycles of open and axial coding until

all the meaningful networks within the data were identified. At the selective coding stage, the first author reduced and combined the codes to form and label unified themes emerging from the data. Through this process, three main themes, which all emphasized that the MAR positively influenced the students' Arabic word reading, were identified in the data: 'activated background knowledge', 'attended teachers' direct corrective feedback', and 'promoted self-regulatory strategies'. To ensure the reliability of the obtained results, two independent coders were recruited to analyze the data separately. Inter-coder reliability was acceptable ($\alpha = 0.87$). Moreover, a member-checking strategy was employed to guarantee the credibility of the data. For this purpose, five students were

invited to check the extracted themes and excerpts to determine whether they adequately represented their intended meanings. They confirmed that the identified themes closely reflected the meanings they had intended to convey.

4. Results and Discussion

4.1. Quantitative Results and Discussion

First, baseline equivalence between the EG and the CG was examined on Quranic word reading accuracy. To answer this question, an independent-samples t-test was conducted. The descriptive statistics for the pre-test scores are presented in Table 1. As shown, the EG obtained an M score of 5.85 (SD = 2.86), whereas the CG obtained an M score of 6.08 (SD = 2.47).

Table 1. Results of Descriptive Statistics on the Pre-test for Both Groups

Variable	Groups	N	Mean	Std. Deviation	Std. Error Mean
Pre-test	EG	27	5.8519	2.86496	.55136
Pre-test	CG	23	6.0870	2.46637	.51427

The assumption of homogeneity of variances was examined through Levene's test, which was not significant, $F = 1.556$, $p = .218$, indicating that the variances of the two groups were sufficiently comparable. Therefore, the results based on the assumption of equal variances are reported. As shown in Table 2, there was no statistically significant difference

between the EG and CG on the pre-test, $t(48) = -.308$, $p = .759$. The M difference was $-.235$, with a 95% confidence interval of $[-1.770, 1.299]$. This finding indicated that the two groups demonstrated comparable baseline levels of Quranic word reading accuracy before the intervention.

Table 2. Results of Independent Samples Test on the Pre-test for Both Groups

Assumption	Levene's F	Levene's Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI Lower	95% CI Upper
Equal variances assumed	1.556	.218	-.308	48	.759	-.23510	.76318	-1.76959	1.29938
Equal variances not assumed			-.312	47.991	.757	-.23510	.75397	-1.75108	1.28087

Next, the analysis examined whether MAR significantly improved Iranian Arabic learners' Quranic word reading accuracy. A one-way ANCOVA was conducted to answer this research question. Before conducting the ANCOVA, the authors checked the required assumptions. First, the linearity assumption was examined through the scatterplot matrix, and no curvilinear relationship was observed. Second, the normality assumption was examined using the Kolmogorov-Smirnov test. The result

showed that the p-value for the post-test scores (.42) was greater than the alpha level of .05, indicating that the data were normally distributed. Third, the equality of variances was examined through Levene's test. The p-value (.08) was larger than the alpha level (.05), suggesting that the assumption of homogeneity of variances was met. After these assumptions were met, the authors proceeded with the one-way ANCOVA. The descriptive results are presented in Table 3.

Table 3. Descriptive Results for Both Groups on the Post-test

Dependent Variable	Groups	N	M	SD
Post-test	Experimental Group	27	16.03	2.13
Post-test	Control Group	23	7.39	2.44
Post-test	Total	50	12.06	4.90

As reported in Table 3, the EG obtained a higher post-test score ($M = 16.03$, $SD = 2.13$) than the CG ($M = 7.39$, $SD = 2.44$). To determine whether this difference remained statistically significant after controlling for pre-test performance, the inferential statistics were examined. As shown in Table 4, a statistically significant adjusted difference was observed between the two groups on the post-test, $F(1,$

$47) = 546.897$, $p < .001$, $\eta^2 = .921$. This finding indicated that MAR had a substantial immediate effect on students' Quranic word reading accuracy. The pre-test covariate was also statistically significant, $F(1, 47) = 95.390$, $p < .001$, $\eta^2 = .670$, showing that baseline performance made a significant contribution to the post-test scores.

Table 4. Results of ANCOVA for Both Groups on the Post-test

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1096.154	2	548.077	311.613	.000	.930
Intercept	466.195	1	466.195	265.058	.000	.849
Pre-test	167.776	1	167.776	95.390	.000	.670
Groups	961.906	1	961.906	546.897	.000	.921
Error	82.666	47	1.759			
Total	8451.000	50				
Corrected Total	1178.820	49				

The estimated marginal Ms further clarified the adjusted difference between the two groups. As reported in Table 5, the adjusted mean score of the EG was 16.112, 95% CI [15.599, 16.626], whereas the adjusted mean score of the CG was 7.303, 95% CI [6.746, 7.860]. These adjusted

means show that participants in the MAR condition achieved higher levels of Quranic word reading accuracy than their counterparts who received traditional repetition-based practice.

Table 5. Estimated Marginal Means for the Post-test

Dependent Variable	Groups	Mean	Std. Error	95% CI Lower Bound	95% CI Upper Bound
Post-test	Experimental Group	16.112	.255	15.599	16.626
Post-test	Control Group	7.303	.277	6.746	7.860

The pairwise comparison in Table 6 also confirmed this difference, showing an adjusted

mean difference of 8.809, $SE = .377$, $p < .001$, 95% CI [8.051, 9.567] in favor of the EG.

Table 6. Pairwise Comparisons Between the Groups on the Post-test

Dependent Variable	(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.	95% CI Lower Bound	95% CI Upper Bound
Post-test	EG	CG	8.809	.377	.000	8.051	9.567
Post-test	CG	EG	-8.809	.377	.000	-9.567	-8.051

The second research question examined whether the effect of MAR on Quranic word reading accuracy was sustained at the one-month follow-up assessment. Another one-way ANCOVA was conducted. Before running the analysis, the authors checked the assumptions. The scatterplot showed no curvilinear relationship between the relevant scores, indicating that the linearity assumption was

met. The Kolmogorov-Smirnov test also showed that the p-value (.32) was greater than the critical value (.05), suggesting that the normality assumption was satisfied. In addition, Levene's test, $F = 4.008$, $p > .05$, indicated that the assumption of equal variances was met. Based on these results, the authors proceeded with the ANCOVA. The descriptive results are presented in Table 7.

Table 7. Descriptive Results for Both Groups on the Delayed Post-test

Dependent Variable	Groups	N	M	SD
Delayed post-test	Experimental Group	27	16.00	1.90
Delayed post-test	Control Group	23	7.60	2.57
Delayed post-test	Total	50	12.14	4.76

As shown in Table 7, the EG obtained a delayed post-test mean score of 16.00 (SD = 1.90), whereas the CG obtained a delayed post-test mean score of 7.60 (SD = 2.57). These descriptive statistics showed that the EG maintained a higher raw mean score one month after the intervention. However, the inferential results needed to be interpreted after adjustment for the covariate. As reported in Table 8, the post-test covariate was statistically significant, $F(1, 47) = 192.180$, $p < .001$, $\eta^2 = .803$,

indicating that immediate post-test performance strongly accounted for delayed post-test performance. However, the group effect on the delayed post-test was not statistically significant after adjustment, $F(1, 47) = 1.742$, $p = .193$, $\eta^2 = .036$. Thus, although higher descriptive scores were observed for the EG, the adjusted model did not provide evidence of a statistically significant difference between the groups at the one-month follow-up point.

Table 8. Results of ANCOVA for Comparing the Groups on the Delayed Post-test

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1066.961	2	533.481	532.815	.000	.958
Intercept	4.156	1	4.156	4.150	.047	.081
Post-test	192.420	1	192.420	192.180	.000	.803
Groups	1.744	1	1.744	1.742	.193	.036
Error	47.059	47	1.001			
Total	8483.000	50				
Corrected Total	1114.020	49				

The estimated marginal Ms reported in Table 9 supported this interpretation. The adjusted mean score was 12.514 for the EG, 95% CI [11.877, 13.151], and 11.701 for the

CG, 95% CI [10.974, 12.428]. Although the adjusted mean remained numerically higher for the EG, the difference did not reach statistical significance.

Table 9. Estimated Marginal Means for the Delayed Post-test

Dependent Variable	Groups	Mean	Std. Error	95% CI Lower Bound	95% CI Upper Bound
Delayed post-test	EG	12.514	.317	11.877	13.151
Delayed post-test	CG	11.701	.361	10.974	12.428

As presented in Table 10, the univariate test confirmed that the group effect on the delayed post-test was not statistically significant, $F(1, 47) = 1.742$, $p = .193$, $\eta^2 = .036$. Therefore, the delayed post-test findings should be interpreted

cautiously. The descriptive scores favored the EG, but the adjusted analysis did not reveal a statistically significant difference between groups after accounting for immediate post-test performance.

Table 10. Results of Univariate Tests for the Delayed Post-test

Dependent Variable	Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Delayed post-test	Contrast	1.744	1	1.744	1.742	.193	.036
Delayed post-test	Error	47.059	47	1.001			

As presented in Table 11, the pairwise comparison also showed a non-significant adjusted mean difference between the EG and the CG on the delayed post-test, MD = .813, SE = .616, $p = .193$, 95% CI [-.426, 2.052]. Since

the confidence interval included zero, this result was consistent with the ANCOVA finding and presented no evidence of a statistically significant adjusted difference between the groups at the one-month follow-up point.

Table 11. Pairwise Comparisons Between the Groups on the Delayed Post-test

Dependent Variable	(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.	95% CI Lower Bound	95% CI Upper Bound
Delayed post-test	EG	CG	.813	.616	.193	-.426	2.052
Delayed post-test	CG	EG	-.813	.616	.193	-2.052	.426

Overall, the quantitative findings revealed that MAR produced a clear and substantial immediate improvement in students' Quranic word reading accuracy. The one-month follow-up results showed that the EG retained a higher raw M score, but the adjusted analysis indicated that this difference was largely accounted for by immediate post-test performance. Therefore, the quantitative evidence supports the immediate effectiveness of MAR, while the follow-up findings should be interpreted with caution. The immediate post-test findings are in line with previous studies in English language education (e.g., Berninger et al., 2010; Nagy, 2007; Stahl & Nagy, 2006; Zrig, 2024), which reported that MAR contributed to improved reading accuracy and fluency. The findings are also consistent with Tibi (2016), Farokhipour (2024), and Smail et al. (2025), who emphasized the critical role of morphological knowledge in the development of Arabic reading skills.

An interesting aspect of the immediate gains is that the participants were learning Arabic as an additional language, yet their performance improved after instruction that increased the salience of roots, patterns, and affixes in Quranic words. This finding supports intervention-based studies conducted across different languages, including Elbro and Arnbak (1996), Goodwin and Ahn (2013), Haddad-Najjar and Abu-Rabia (2025), Quémart and Casalis (2015), and Zrig (2024), which reported positive effects of morphological instruction on reading-related outcomes. The present results also lend support to Al-Musawi (2014) and Farokhipour (2024), who highlighted the role of MA in Arabic literacy development. Moreover, the findings are compatible with previous studies showing that Arabic reading comprehension may be enhanced through morphological knowledge and MAR (Haddad-Najjar & Abu-Rabia, 2025; Mahfoudhi et al., 2010; Vaknin-Nusbaum & Saiegh-Haddad, 2020).

The immediate improvement in the EG may be attributed to the role of MAR in helping

students process unfamiliar Quranic words through their internal structure. As students' morphological knowledge developed, they may have become increasingly capable of identifying roots, prefixes, suffixes, and patterns and of leveraging these elements to support accurate oral reading. In line with Ku and Anderson (2003), the ability to decompose unfamiliar words into meaningful units may strengthen word-form processing and support more stable word recognition. This explanation is particularly relevant to Arabic because Arabic words are morphologically dense and often require sensitivity to both linear and nonlinear structures. In this respect, the intervention may have facilitated students' processing of Quranic words through morphological cues that are central to Arabic word recognition (Shalhoub-Awwad & Leikin, 2016).

Overall, the quantitative findings suggest that MAR can enhance learners' immediate Quranic word reading accuracy by strengthening their attention to the morphological structure of Arabic words. Aligned with Deacon et al. (2013) and Asaad (2024), this improvement may be interpreted in terms of the link between MA and word-level processing. However, the findings from the one-month follow-up analysis should be interpreted with greater caution. Although the descriptive results continued to favor the EG, the adjusted analysis did not show a statistically significant difference between the groups. Thus, the strongest conclusion is that MAR had a substantial immediate effect, while more extended follow-up studies are needed to determine whether this advantage persists and becomes stable over time.

4.2. Qualitative Results and Discussion

The third research question explored the Iranian Arabic learners' perceptions of the role of MAR in cultivating Quranic lexical knowledge. The results of the content analysis yielded three main themes, revealing that the participants viewed MAR positively and perceived it as effective in fostering their Quranic lexical

knowledge. They included ‘activated background knowledge’, ‘attended teachers’ direct corrective feedback’, and ‘promoted self-regulatory strategies’.

4.2.1. Activated Background Knowledge

The participants pinpointed that raising awareness of the features of Quranic lexical knowledge enabled them to draw more effectively on their existing knowledge when they encountered difficult Arabic words. In this regard, one of the participants stated:

When my attention is drawn to the phonological and morphological features of the words, I can combine them with my previous knowledge. In this way, I can consolidate my learning and read the words more easily.

Consistent with the statements above, the participants also underlined that the awareness-raising helped them to connect newly learned material with their prior knowledge to make their learning meaningful. In this respect, one of the participants remarked:

I found the teacher’s strategy really useful because it made my learning meaningful. I mean that when my teacher highlighted the features of Arabic words regarding morphology, I could make clear connections between the new information and the older one in my memory. This made it easier for me to learn and recall them better in future readings.

Such interconnections between the attended linguistic features and the learners’ prior knowledge, which fostered greater consciousness-raising, have been reported in previous studies (Fazlali & Shahini, 2019; Inceoglu, 2021; Svalberg & Askham, 2020). When learners noticed these linguistic features, they appeared to retrieve relevant background knowledge, which might have enhanced their involvement with the target linguistic features (Ellis et al., 2019) and may have supported their deeper engagement with the target morphological features.

4.2.2. Attended Teachers’ Direct Corrective Feedback

Another recurring theme concerned the perceived value of the teacher’s direct feedback in addressing the participants’ morphological mistakes. One of the participants pinpointed the value of awareness raising as follows:

When I made mistakes in reading the Arabic

words, my teacher made me aware of them. This direct feedback assisted me in understanding and correcting my mistakes. In the following times, I knew that I should avoid those mistakes.

In agreement with the former remark, the participants highlighted that the advantages of the teacher’s direct feedback extended beyond feedback on their own errors. In essence, they also learned from the teacher’s immediate feedback to their peers regarding morphological features. In support of this, one of the participants remarked:

I learned a great deal from the feedback that our teacher offered to peers. When a classmate misread a word, our teacher presented the required feedback. Actually, I could benefit from that feedback to fill the gaps in my competence. Thus, I feel that many of the peers might have benefited from the negotiations.

These excerpts suggest that all the participants declared benefiting from the given oral corrective feedback by the teacher, whether it was self-directed or peer-directed. The previous research has reported these benefits of the teacher’s direct feedback in language learning (e.g., Baker & Burri, 2016; Boggs, 2019; Li & Vuono, 2019). In this study, the feedback appeared to be particularly valuable because it directed learners’ attention to accurate Quranic word reading and helped them notice the structural source of their errors (Reynolds & Teng, 2021; Vásquez & Harvey, 2010). Accordingly, they might have utilized all forms of feedback provided in the class to promote their accuracy.

4.2.3. Promoted Self-Regulatory Strategies

The participants also noted that this technique encouraged them to draw upon and employ self-regulatory strategies. In this regard, one of them mentioned that:

When the teacher drew our attention to important features of Arabic morphology during the class, I took notes in the margins of my books to summarize the key points. Doing so helped me connect different features more easily and develop a deeper understanding of them.

Consistent with the previous excerpt, as a self-regulatory strategy, the participants stressed that increased awareness of the phonological and morphological features of the words facilitated rule formation, enabling them to test hypotheses and generalize learned rules to new contexts. In this respect, one of the

participants stated:

You know that reading in Arabic is much more difficult than in Persian. I usually try to make different hypotheses about how words should be read. When I made mistakes, my teacher provided me with feedback that assisted me in correcting my hypotheses and generalizing them to proper situations.

These excerpts disclose that MAR may help learners activate self-regulatory strategies to manage their learning and replace incorrect forms with accurate alternatives. According to Schunk and Zimmerman (2023), two main components of self-regulation are “evaluation and planning”, which were actively engaged in this study as the participants were exposed to a chain of noticed inputs, evaluated their own output, and planned any needed modifications of their output to remove the mistakes. The development of such self-regulatory processes through increased language awareness has been reported in various studies (Bursali & Öz, 2018; Hadwin & Oshige, 2011; Shyr & Chen, 2018).

5. Conclusions and Pedagogical Implications

As discussed above, the present study investigated the effect of MAR on cultivating Iranian students’ Quranic word reading accuracy and morphologically informed Quranic lexical learning. The findings uncovered that the participants’ Quranic word reading accuracy improved significantly at the immediate post-test. The complementary qualitative results yielded three overarching themes: activated background knowledge, attended teachers’ direct corrective feedback, and promoted self-regulatory strategies. Based on the findings, raising students’ awareness of the morphological features of Arabic words appears to facilitate the consolidation of learning. Aligned with the results of this study, it may be argued that directing learners’ attention to the morphological features of Arabic words can enhance their ability to read the target Quranic words more accurately and to explain how roots, patterns, affixes, and pronunciation cues support their learning. The one-month delayed post-test should be interpreted cautiously because the adjusted group difference was not statistically significant, although the descriptive means remained higher for the EG. Therefore, the conclusions are confined to the measured outcome and the interview-based perceptions

reported by the participants.

The findings of the study may offer a range of implications for relevant stakeholders. First, teacher trainers should consider incorporating innovative instructional approaches, such as awareness-raising techniques, into Arabic language teacher education programs. They should help Arabic teachers develop an understanding of the principles and procedures underlying these instructional approaches so that they can implement them in their classes. Second, Arabic materials developers should consider raising awareness when designing educational materials. For example, they can highlight, underline, or circle the intended structures within the educational materials. Such techniques may draw learners’ attention to these structures, promoting focused processing and more effective internalization. Third, Arabic teachers should try to learn and practice teaching strategies, such as MAR. The implementation of this strategy may support learning by drawing students’ attention to roots, patterns, affixes, and pronunciation cues. Finally, Arabic learners should note that Quranic Arabic learning can be strengthened by improving their ability to read and analyze word forms accurately. For this purpose, they can benefit from the awareness-raising strategy. These implications should be interpreted primarily in relation to Quranic word reading accuracy and learners’ awareness of Quranic word structure rather than to broader learning outcomes that were not directly assessed in the present study.

Some limitations were identified in the present study, which provide the basis for future research. First, because the current study employed a short-term quasi-experimental mixed-methods design with a one-month delayed post-test, future research could adopt a longitudinal design to examine the long-term effects of MAR on the reading skills of Arabic learners. Moreover, the study was conducted with two intact female Grade 7 classes in one school. Accordingly, caution should be exercised when generalizing the findings to male learners, mixed-gender classrooms, other grade levels, other educational settings, or learners with different Arabic-learning backgrounds. Future research should therefore replicate the intervention across multiple schools, larger samples, and more diverse learner populations to examine the extent to

which the observed instructional pattern remains stable across educational settings. Second, future studies can investigate how digital and technology-mediated instructional tools can be integrated with MA instruction to promote learners' morphological awareness and reading proficiency.

Third, further studies are needed to explore the interplay between MAR and other linguistic factors such as phonological awareness and vocabulary in the development of reading skills. Fourth, researchers interested in this field can compare the effectiveness of different instructional approaches, such as explicit and implicit instruction, in cultivating MAR and reading skills among Arabic learners. Last but not least, additional studies are required to explore the impact of MAR interventions on different learner populations, including learners with specific learning difficulties or those with different first-language backgrounds.

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