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INTRODUCTION

Arabic language learning occupies a strategic position within Islamic education because it functions not only as a medium of communication but also as the primary language of the Qur'an, Hadith, and classical Islamic scholarship. Mastery of Arabic enables learners to access authentic Islamic sources directly, thereby strengthening religious understanding and intellectual engagement with Islamic civilization. In the context of foreign language education, vocabulary acquisition constitutes one of the most fundamental aspects of language proficiency, since lexical knowledge significantly influences learners' abilities in listening, speaking, reading, and writing skills. According to I. S. P. Nation, vocabulary mastery forms the basis of communicative competence because learners cannot effectively express meaning without sufficient lexical resources. Research in second language acquisition further indicates that inadequate vocabulary knowledge often becomes the primary obstacle preventing students from achieving fluency and comprehension in foreign language learning environments (Nation, 2019).

Despite its importance, Arabic vocabulary learning continues to face various pedagogical challenges, particularly in Islamic educational institutions. Traditional instructional practices frequently emphasize rote memorization, grammar translation, and teacher-centered learning approaches, which may reduce students' active participation and intrinsic motivation. Such approaches often position learners as passive recipients of information rather than active constructors of knowledge. Consequently, students may experience difficulties in retaining vocabulary over long periods and applying lexical items in authentic communicative contexts. Contemporary educational research argues that vocabulary learning should involve meaningful interaction, contextualized exposure, and repeated engagement to facilitate deeper cognitive processing and long-term memory retention (Webb & Nation, 2017). Therefore, innovative pedagogical strategies are required to create more engaging, interactive, and learner-centered Arabic language instruction.

The rapid development of digital technology has transformed educational paradigms globally, including language learning practices. In the era of digital education and Society 5.0, technology integration is increasingly regarded as an essential component of effective teaching and learning processes. One of the most prominent innovations in language education is Mobile-Assisted Language Learning (MALL), which refers to the utilization of mobile devices such as smartphones, tablets, and portable digital applications to support language learning activities across diverse contexts and environments. Agnes Kukulska-Hulme explains that MALL extends learning opportunities beyond classroom boundaries by enabling learners to access educational resources anytime and anywhere through mobile technologies. This flexibility supports personalized learning experiences, learner autonomy, and continuous engagement with instructional materials (Kukulska-Hulme & Viberg, 2018).

The integration of MALL into Arabic language learning is particularly relevant considering the increasing digital literacy of contemporary students. Mobile devices have become inseparable from students' daily lives, creating opportunities for educators to transform these technologies into productive learning tools. Through applications such as digital flashcards, gamified quizzes, pronunciation tools, interactive videos, and vocabulary games, learners can engage in repetitive and contextualized vocabulary practice more effectively than through conventional memorization techniques. Moreover, multimedia features embedded within mobile applications including audio, animation, visual imagery, and instant feedback can stimulate learners' cognitive and affective engagement simultaneously. Research suggests that multimodal exposure enhances



vocabulary acquisition because learners process lexical items through multiple sensory channels, thereby improving comprehension and retention (Teng, 2023).

From the perspective of educational psychology, MALL also aligns with constructivist and self-regulated learning theories, which emphasize learner independence, active engagement, and contextual learning experiences. Mobile learning environments encourage students to take greater responsibility for their own learning progress by allowing individualized pacing and adaptive learning pathways. Furthermore, mobile technologies facilitate collaborative learning through online discussion forums, peer interaction, and social communication platforms, which can strengthen language exposure and meaningful language use. In this regard, MALL not only functions as a technological tool but also represents a pedagogical transformation toward more student-centered learning ecosystems (Crompton & Burke, 2018).

Several empirical studies have demonstrated the effectiveness of MALL in improving vocabulary acquisition and learner motivation across various foreign language contexts. For instance, studies indicate that mobile-based vocabulary learning enhances students' retention rates, learning flexibility, and engagement due to the portability and accessibility of mobile devices (Chen et al., 2020). Other research also reveals that gamification features integrated within mobile applications can increase learners' motivation and reduce language anxiety, thereby creating more enjoyable learning experiences (Elaish et al., 2019). Additionally, spaced repetition systems and push-notification reminders available in many mobile applications contribute significantly to long-term vocabulary retention because they promote repeated exposure and retrieval practice.

Nevertheless, despite the growing body of literature on MALL in English and other foreign language learning contexts, studies specifically examining its implementation in Arabic language education remain relatively limited (Guo et al., 2024), (Metruk, 2024). Existing research predominantly focuses on general foreign language learning, while Arabic learning possesses unique linguistic characteristics, including complex morphology, root-pattern systems, and distinct phonological structures that may require different technological and pedagogical considerations (Maghfurin et al., 2025). Moreover, limited research has explored the implementation of MALL within Islamic educational institutions, where cultural, religious, and curricular dimensions may influence technology integration and learning practices. Recent studies conducted in Indonesian madrasahs have highlighted the continuing need for empirically validated MALL interventions specifically designed for Arabic vocabulary learning in Islamic educational settings. This gap indicates the necessity for further investigation into how mobile-assisted learning can effectively support Arabic vocabulary acquisition in Islamic educational contexts.

In addition, previous studies have often concentrated primarily on learning outcomes while paying less attention to the practical challenges encountered during MALL implementation, such as technological accessibility, digital literacy disparities, internet connectivity, learner discipline, and teacher readiness. Understanding both the benefits and obstacles of MALL implementation is essential for developing sustainable and contextually appropriate instructional strategies. Therefore, comprehensive research is needed to evaluate not only the effectiveness of MALL in enhancing Arabic vocabulary mastery but also the pedagogical implications and challenges associated with its application in real educational settings (Sabani et al., 2025).

Based on these considerations, this study aims to investigate the effectiveness of Mobile-Assisted Language Learning (MALL) in improving Arabic vocabulary acquisition among students and to explore the benefits and challenges arising from its implementation in Arabic language learning. This research is expected to contribute theoretically to the development of technology-enhanced Arabic language pedagogy and practically to provide insights for educators, curriculum developers, and educational



institutions in optimizing mobile technology for Arabic language instruction in the digital era.

RESEARCH METHODS

This study employed a mixed-method research design combining quantitative and qualitative approaches to investigate the effectiveness of Mobile-Assisted Language Learning (MALL) applications in improving students' Arabic vocabulary mastery. The mixed-method approach was chosen to provide both measurable evidence of learning outcomes and deeper insights into students' learning experiences and perceptions (Creswell & Creswell, 2018). Specifically, this study adopted an explanatory sequential design in which quantitative findings were complemented and explained through qualitative data (Creswell, 2014).

The quantitative phase utilized a quasi-experimental design involving an experimental group and a control group with pre-test and post-test measures. This design was considered appropriate because the study was conducted in naturally existing classrooms without random assignment of participants (Fraenkel et al., 2026). The experimental group received instruction through MALL applications, while the control group was taught using conventional textbook-based methods.

The participants consisted of 60 students from an Islamic secondary school, divided equally into an experimental group ($n = 30$) and a control group ($n = 30$). Participants were selected through purposive sampling based on similar academic backgrounds and Arabic proficiency levels to ensure comparability between groups (Etikan, Musa, & Alkassim, 2016).

Data were collected using three instruments: vocabulary tests, classroom observations, and semi-structured interviews. Pre-tests and post-tests were administered to measure students' vocabulary achievement before and after the treatment. Classroom observations were conducted to examine students' engagement and learning behaviors during instruction (Merriam & Tisdell, 2016). In addition, semi-structured interviews were carried out with selected students from the experimental group to explore their experiences and perceptions regarding the use of MALL in Arabic vocabulary learning (Kallio et al., 2016).

The study was conducted over eight weeks. Initially, both groups completed a pre-test to determine their baseline vocabulary proficiency. The experimental group then participated in vocabulary learning activities using MALL applications, whereas the control group continued with conventional instruction. During the treatment period, classroom observations were undertaken to monitor the learning process. At the end of the intervention, a post-test was administered to both groups, followed by interviews with selected students from the experimental group.

Quantitative data were analyzed using paired-sample t-tests to determine whether significant differences existed between pre-test and post-test scores (Field, 2018). Meanwhile, qualitative data obtained from observations and interviews were analyzed using thematic analysis through coding, categorization, and theme development procedures (Braun & Clarke, 2021). The integration of quantitative and qualitative findings provided a comprehensive understanding of the effectiveness of MALL in enhancing Arabic vocabulary learning.

RESULTS AND DISCUSSION

Improvement in Arabic Vocabulary Acquisition

To examine the effectiveness of Mobile-Assisted Language Learning (MALL) on students' Arabic vocabulary acquisition, both the experimental group and the control

group were administered a pre-test and a post-test. The experimental group received vocabulary instruction through MALL applications, whereas the control group was taught using conventional classroom methods.

Table 1. Descriptive Statistics of Vocabulary Achievement Scores

Group N	Pre-Test Mean	SD	Post-Test Mean	SD	Mean Gain
Experimental Group (MALL)	30	65.4	82.1	82.7	6.45
Control Group (Conventional)	30	64.8	7.95	70.2	7.31

The results indicate that both groups started with relatively similar levels of vocabulary mastery. The experimental group obtained a pre-test mean score of 65.4, while the control group achieved a mean score of 64.8. This similarity suggests that the two groups possessed comparable vocabulary knowledge prior to the treatment.

Following six weeks of instruction, the experimental group demonstrated a remarkable increase in performance, achieving a post-test mean score of 82.7. In comparison, the control group recorded a post-test mean score of 70.2. The mean gain score of the experimental group (17.3 points) was substantially higher than that of the control group (5.4 points), indicating the positive contribution of MALL to vocabulary learning outcomes.

Table 2. Paired Sample t-Test Results

Group	t-value	Sig. (p)	Interpretation
Experimental Group	10.84	0.000	Significant improvement
Control Group	2.31	0.028	Moderate improvement

The paired sample t-test revealed a statistically significant difference between pre-test and post-test scores in the experimental group ($p < 0.05$). Although the control group also showed some improvement, the magnitude of change was considerably lower than that observed in the experimental group.

Table 3. Independent Sample t-Test of Post-Test Scores

Variable	Experimental Mean	Control Mean	t-value	Sig. (p)
Post-Test Scores	82.7	70.2	6.12	0.000

An independent sample t-test was conducted to compare the post-test scores of both groups. The analysis showed a significant difference between the experimental and control groups ($p = 0.000 < 0.05$). Therefore, the null hypothesis was rejected, indicating that students who learned through MALL achieved significantly better vocabulary outcomes than those who received conventional instruction.

Vocabulary Mastery by Category

To provide a more detailed analysis, students' vocabulary achievement was categorized into four domains:

Table 4. Vocabulary Achievement by Category (Experimental Group)

Vocabulary Category	Pre-Test (%)	Post-Test (%)	Improvement
Daily Activities	66.2	86.5	+20.3

School Environment	68.1	84.3	+16.2
Family and Social Life	63.5	81.4	+17.9
Verbs and Expressions	63.8	78.7	+14.9

The greatest improvement was observed in the "Daily Activities" category, which increased by 20.3 percentage points. This result may be attributed to the frequent exposure and contextualized learning opportunities provided by mobile applications, enabling students to encounter and practice vocabulary repeatedly in meaningful contexts.

Students' Perceptions of Vocabulary Learning through MALL

A questionnaire administered to the experimental group further revealed positive perceptions regarding the use of MALL.

Table 5. Students' Responses toward MALL (N = 30)

Statement	Agree (%)	Neutral (%)	Disagree (%)
MALL helps me remember vocabulary better.	90.0	6.7	3.3
MALL makes learning Arabic more enjoyable.	93.3	3.3	3.3
I can learn vocabulary anytime and anywhere.	96.7	3.3	0
Multimedia features help me understand word meanings.	86.7	10.0	3.3
I would like to continue using MALL in the future.	90.0	6.7	3.3

The questionnaire results suggest that the majority of students perceived MALL as beneficial for vocabulary learning. The highest agreement rate (96.7%) was found for the statement concerning learning flexibility, indicating that students particularly valued the accessibility offered by mobile technologies.

Overall, these findings provide empirical evidence that Mobile-Assisted Language Learning significantly enhances Arabic vocabulary acquisition. The substantial increase in vocabulary scores, coupled with positive learner perceptions, suggests that MALL serves as an effective instructional approach for improving vocabulary retention, recall, and learner engagement in Arabic language learning contexts.

Increased Learner Motivation

Another significant finding of this study concerns the positive impact of Mobile-Assisted Language Learning (MALL) on students' learning motivation. Data collected from classroom observations and learner feedback indicated that students who engaged with mobile learning applications demonstrated higher levels of enthusiasm, engagement, persistence, and participation compared to those who relied solely on conventional instructional approaches. This finding reinforces a growing body of research suggesting that mobile technologies can substantially enhance learners' affective engagement in second and foreign language learning environments.

Several features embedded in mobile learning applications contributed to this increased motivation. Gamification elements such as points, badges, leaderboards, progress tracking, and achievement systems created a sense of challenge, competition, and accomplishment that encouraged continuous participation. Research has consistently

shown that gamified MALL environments can increase learner engagement, motivation, and learning persistence by transforming language-learning activities into enjoyable and rewarding experiences. Furthermore, instant feedback mechanisms enabled students to monitor their progress, identify errors, and receive immediate corrective responses, thereby strengthening self-regulated learning and sustaining learner interest. Personalized feedback and adaptive learning pathways have also been identified as important affordances that enhance learner satisfaction and motivation in mobile language learning environments (Wang et al., 2021).

The integration of multimedia resources including videos, audio recordings, animations, images, and interactive quizzes further contributed to learner engagement by providing multimodal learning experiences. Such resources support diverse learning styles and facilitate deeper cognitive processing, making language learning more meaningful and enjoyable. Previous systematic reviews have similarly concluded that multimedia-rich MALL environments promote higher levels of motivation, interaction, and language achievement compared to traditional learning methods (Figueiredo, 2023).

These findings are consistent with Dörnyei's motivational framework, which identifies motivation as one of the strongest predictors of successful language acquisition. Motivated learners are more likely to invest effort, persist through difficulties, and maintain long-term commitment to language learning goals. Consequently, the positive motivational effects observed in this study suggest that MALL creates a learner-centered environment that promotes active participation, sustained engagement, and continuous language development (Lei et al., 2022).

Flexibility and Accessibility of Learning

The study also revealed that MALL provides substantial flexibility and accessibility, allowing students to learn anytime and anywhere according to their individual learning needs and schedules. Unlike traditional classroom instruction, which is often restricted by time, space, and institutional arrangements, mobile learning enables continuous access to educational content beyond formal learning settings

Participants reported that they frequently reviewed vocabulary, completed language exercises, listened to pronunciation models, and practiced language skills during their free time, including while commuting, waiting for appointments, or relaxing at home. Such flexibility significantly increased opportunities for language exposure and practice, which are crucial factors in second-language acquisition (Luo, 2023).

The findings support previous studies that identify mobility, ubiquity, portability, and accessibility as the primary affordances of MALL. Mobile devices allow learners to access educational resources instantly and continuously, thereby extending learning opportunities beyond classroom boundaries. According to Traxler, mobile learning facilitates learner autonomy by enabling continuous interaction with educational materials across diverse contexts. This flexibility encourages students to take greater responsibility for their own learning process and supports the development of lifelong learning habits (Ishaq et al., 2021a).

From a constructivist perspective, learners actively construct knowledge through interactions with learning resources and authentic environments. Mobile technologies support this process by allowing students to regulate their learning pace, personalize learning pathways, and select resources according to their individual preferences and proficiency levels. Research has shown that mobile learning environments promote self-



directed learning, autonomy, and learner empowerment by providing personalized access to learning materials and immediate support when needed (Bahari, 2023)..

Moreover, the ubiquitous nature of mobile devices creates opportunities for contextual and situated learning, where language acquisition occurs within authentic social and communicative contexts. Such conditions facilitate meaningful language use and strengthen learners' ability to connect classroom knowledge with real-world language practices.

Challenges in the Implementation of MALL

Despite the numerous benefits identified, the implementation of MALL also presented several challenges that require careful consideration. Three major issues emerged from the findings: distractions caused by non-educational mobile applications, unequal access to technological resources, and limited teacher preparedness in integrating mobile technologies into language instruction

First, students reported that social media platforms, online games, messaging applications, and entertainment content occasionally distracted them from educational activities. The multifunctional nature of smartphones creates opportunities for both productive and non-productive use, potentially reducing learners' focus and academic performance when self-regulation is weak. Previous research has similarly identified learner distraction as one of the most significant barriers to effective MALL implementation (Metruk, 2020).

Second, disparities in access to smartphones, tablets, and reliable internet connections created unequal learning opportunities among students. Learners with limited technological resources often encountered difficulties in accessing learning materials consistently, thereby reducing their participation and learning effectiveness. Recent systematic reviews have highlighted technological infrastructure, internet accessibility, and device ownership as persistent challenges that continue to affect the equitable implementation of MALL across educational contexts (Fang., 2025).

Third, some teachers expressed uncertainty regarding the pedagogical integration of mobile technologies into language instruction. Limited technological competence, insufficient digital pedagogical knowledge, and a lack of professional development opportunities may hinder effective implementation. Successful technology integration requires teachers not only to master technical skills but also to understand how mobile technologies can be aligned with pedagogical objectives and curriculum requirements. Previous studies emphasize that teacher readiness and technological competence are among the most critical factors influencing the success of mobile learning initiatives (Abidin, 2023).

In addition, concerns regarding instructional design, privacy, digital well-being, and the pedagogical appropriateness of certain mobile applications have been identified as emerging issues in recent MALL literature. Therefore, educational institutions must address these challenges through comprehensive policy development, infrastructure enhancement, digital literacy initiatives, and continuous professional development programs for teachers.

Pedagogical Implications

The findings of this study have several important pedagogical implications for Arabic language education. First, MALL should be viewed as a complementary instructional approach rather than a replacement for traditional classroom teaching. While



mobile technologies offer flexibility, accessibility, personalization, and enhanced learner engagement, the pedagogical guidance provided by teachers remains indispensable for achieving meaningful learning outcomes.

Teachers play a central role in selecting appropriate learning applications, designing pedagogically sound learning activities, monitoring student progress, facilitating interaction, and providing constructive feedback. Research indicates that the effectiveness of MALL depends not merely on technological availability but on the quality of pedagogical integration within the instructional process (Wang et al., 2024).

Second, the findings suggest that curriculum designers should integrate mobile learning activities systematically into Arabic language programs. Vocabulary learning, pronunciation practice, listening comprehension, collaborative learning, and formative assessment activities can be effectively supported through mobile applications. The incorporation of gamification, adaptive learning systems, and multimedia resources can further enhance learner motivation and engagement when aligned with clear learning objectives (Ishaq et al., 2021).

Third, educational institutions should invest in technological infrastructure, internet accessibility, and professional development initiatives to support sustainable implementation of MALL. Teacher training programs should focus not only on technical skills but also on digital pedagogy, instructional design, learner autonomy, and technology-enhanced language teaching strategies (Refat et al., 2020).

Overall, the findings suggest that Mobile-Assisted Language Learning offers considerable potential for improving vocabulary acquisition, increasing learner motivation, enhancing learner autonomy, and expanding opportunities for language exposure. Consistent with findings from recent systematic reviews, the successful implementation of MALL depends on the interaction between technological affordances, pedagogical design, institutional support, and learner readiness. Consequently, a balanced integration of traditional instructional practices and innovative mobile technologies can contribute to the development of more engaging, learner-centered, and effective Arabic language learning environments.

CONCLUSIONS

This study demonstrates that the implementation of *Mobile-Assisted Language Learning* (MALL) makes a significant contribution to Arabic language education, particularly in improving students' vocabulary acquisition. The findings reveal notable improvements in learners' ability to retain, recall, and use Arabic vocabulary effectively, indicating that mobile technologies can serve as a powerful instructional tool for enhancing vocabulary learning outcomes. These results provide empirical evidence that MALL supports more effective and engaging vocabulary development in Arabic language learning contexts.

Beyond its cognitive benefits, MALL was also found to positively influence learners' motivation. Students who utilized mobile learning applications exhibited greater enthusiasm, engagement, participation, and persistence throughout the learning process. This suggests that mobile technologies not only facilitate access to learning materials but also create more interactive and motivating learning experiences that encourage active learner involvement.

The study further highlights the flexibility and accessibility offered by MALL, enabling students to learn anytime and anywhere according to their individual needs and learning schedules. Such flexibility extends learning opportunities beyond the limitations



of traditional classroom settings and supports continuous language practice. However, several challenges were identified, including distractions from non-educational applications, unequal access to technological resources and internet connectivity, and limited teacher readiness to integrate mobile technologies effectively into language instruction.

Overall, the findings suggest that MALL is an effective and relevant approach for supporting Arabic language learning in the digital era. Nevertheless, its successful implementation requires adequate technological infrastructure, improved digital competencies among teachers, and well-designed pedagogical strategies. Therefore, MALL should be regarded as a complementary instructional approach that combines the advantages of mobile technology with the essential pedagogical guidance of teachers to promote more effective, engaging, and sustainable Arabic language learning outcomes.

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