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Teachers' Experiences With Mobile Apps for Arabic Language Learning: Insights From Islamic Schools in Palu, Indonesia

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***Abstract*—The integration of mobile applications in Arabic language learning has become increasingly relevant with the advancement of technology, particularly within Islamic schools (madrasahs). This study investigates the perspectives of Islamic school stakeholders in Palu, Central Sulawesi, Indonesia, regarding the use of mobile apps for Arabic language teaching and learning. Using the framework of Mobile-Assisted Language Learning (MALL) and the Technology Acceptance Model (TAM), this research explores the understanding and the awareness of stakeholders, their perception, challenges and barriers encountered during the use of mobile applications, and suggestion for potential improvements of mobile apps in the Arabic language learning process. Data were collected from teachers, students, school administrators, parents to better understand the awareness of stakeholders, their perceptions of mobile app utility, ease of use, and the integration into the curriculum. Findings indicate that while mobile apps enhance flexibility, engagement, and interactive learning, several challenges persist, including infrastructural limitations, teacher readiness, and cultural attitudes of both teachers and students toward technology. The study highlights the necessity of tailored technological solutions that align with pedagogical and religious values of Islamic education. Recommendations include improved teacher training, enhanced mobile apps content relevance, and institutional support for technology integration. By providing insights into the specific educational context of Palu, this research contributes to a broader understanding of mobile applications in Arabic language learning and offers practical implications for teachers, regional education stakeholders, app developers, and policymakers.**

***Index Terms*—Mobile-Assisted Language Learning (MALL), Technology Acceptance Model (TAM), Arabic language learning, digital learning**

I. Introduction

Rapid technological advances in education have significantly transformed language teaching and learning practices worldwide. Among these innovations, mobile applications (apps) have emerged as a powerful tool for language acquisition, offering interactive, flexible, and personalized learning experiences that transcend the boundaries of traditional classroom settings. These apps allow learners to access language content anytime and anywhere, making them highly relevant in an increasingly mobile and digitally connected world. In the field of Arabic language learning—especially in Islamic schools—the integration of mobile technology presents significant potential to enrich the learning process, increase engagement, and bridge the gap in teaching resources. However, the effectiveness and acceptability of mobile apps in Arabic language teaching, especially in a specific cultural and regional context such as Palu, Central Sulawesi, require thorough and context-sensitive investigation.

Mobile-Assisted Language Learning (MALL) has gained significant traction globally as a method for integrating mobile technology into language education. Research shows that mobile apps can enhance language learning by providing learners with immediate access to vocabulary practice, grammar exercises, multimedia resources, and interactive assessments (Gafni et al., 2017; Holozsai & Jozsep, 2024; Choto Iza & Yepez Masapanta, 2025). The MALL approach is particularly effective in supporting vocabulary acquisition, listening comprehension, and speaking fluency, making it a valuable tool for educators seeking to extend learning beyond the classroom (Kukulska-Hulme & Shield, 2008; Zain & Bowles, 2021).

In Arabic language learning, especially for non-native speakers, the adoption of mobile learning tools remains an emerging but promising field. Studies show that technology can facilitate mastery of Arabic script, pronunciation, and grammar, while providing an engaging way to engage with religious and cultural content (Ghanem, 2020). However, the implementation of these tools in Islamic educational institutions—madrasahs—remains uneven. Madrasahs play a crucial role in preserving and promoting Arabic as the language of the Quran and Islamic scholarship. Integrating modern educational technology into these environments is often complicated by infrastructure constraints, limited digital literacy, varying teacher preparedness, and, in some cases, cultural skepticism about the role of technology within traditional pedagogical frameworks (Abdullah et al., 2019).

The cultural and regional context of Palu, Central Sulawesi, is particularly relevant in this regard. As the capital of a province with a rich Islamic heritage, Palu places great importance on Arabic language instruction in its madrasahs (Islamic schools). However, the adoption of digital learning tools is hampered by challenges such as inconsistent internet connectivity, inadequate training for educators, and a lack of localized Arabic language learning resources. Assessing the perceptions of local stakeholders—teachers, students, and administrators—provides critical insights into the opportunities and barriers to integrating mobile apps into Arabic language instruction in this context.

Stakeholder perspectives play a crucial role in shaping the success of educational technology initiatives. Teachers' attitudes toward mobile learning have been shown to directly influence adoption rates and teaching practices (Teo, 2011). In madrasas, educators' acceptance of mobile applications for Arabic language instruction is influenced not only by their technological proficiency but also by their assessment of how these tools align with Islamic educational values (Fauzi & Aslan, 2020). Students' perspectives are equally important, as their continued engagement with mobile applications depends on user-friendly design, culturally relevant content, and the perceived usefulness of the tools in achieving their language learning goals (Hsu, 2013). Furthermore, administrator support is crucial for allocating resources, providing professional development, and integrating mobile learning into the institution's curriculum (Albirini, 2006).

While global research on MALL continues to grow, there is a lack of local studies focused on regions like Palu, where unique intersections of culture, religion, and education shape technology adoption. This study addresses this gap by examining the experiences, challenges, and recommendations of madrasah stakeholders in Palu regarding the use of mobile applications for Arabic language instruction. Specifically, this study aims to answer: (1) What are the most commonly used mobile applications for Arabic language instruction in madrasahs in Palu? (2) How do teachers, students, and administrators perceive their effectiveness? (3) What challenges hinder successful implementation? and (4) What suggestions do stakeholders provide for improvement?

The objectives of this study focused on four issues: to investigate the effectiveness of mobile applications in enhancing Arabic language learning in Islamic schools; to understand stakeholders' perceptions of their use; to identify barriers in its implementation; and to explore recommendations for better technology integration in Arabic language teaching and learning. By situating MALL within the cultural and educational realities of Palu, this study aimed to generate insights that informed the development of more effective, culturally appropriate, and sustainable digital learning solutions for Arabic language learning in Indonesia.

II. Review of Relevant Literature

A. Mobile-Assisted Language Learning (MALL) in Teaching Arabic as a Foreign Language

Mobile-Assisted Language Learning (MALL), a branch of Computer-Assisted Language Learning (CALL), focuses on the use of mobile devices for language learning, including Arabic. Its main advantages lie in its flexibility, personalization, and the integration of interactive media that support reading, listening, writing, and speaking skills. In

the context of this research, the relevance of MALL is seen in three aspects. First, the flexibility and personalization of learning allow students to access materials anytime and anywhere (Slavuj, 2023). Second, its mobile nature facilitates the analysis of application accessibility during the teaching and learning process in Indonesia, particularly in Palu, where limited internet infrastructure is a challenge. Third, the interactivity and multimedia in Arabic language applications have been shown to enhance learning (Rajendran & Yunus, 2021; Kukulska-Hulme & Viberg, 2018; Reinders & Pegrum, 2016).

Previous research has shown that MALL creates an engaging and interactive learning environment, increases student engagement, and supports personalized learning paths (Burston, 2014; McQuiggan, 2015; Sonmez et al., 2018; Burston & Arispe, 2022). For example, the application *Takallam* developed for oral communication skills can strengthen students' vocabulary and grammar (Mohammad et al., 2023). Students who use MALL tend to have a positive attitude toward learning because they can learn at their own pace and style (Zare & Derakhshan, 2022; Alkhudair, 2020). However, challenges remain, such as gaps in technology access and the need for teacher training, which need to be addressed for effective implementation in resource-constrained areas.

While MALL presents significant advantages, challenges such as technological accessibility and the need for teacher training remain critical considerations in its implementation especially in the context of Palu where the access to internet is not always easy for all students and teachers alike.

B. Theory of Acceptance Model (TAM) in the Arabic Teaching and Learning

The Technology Acceptance Model (TAM), developed by Davis et al. (1989), explains technology acceptance through two main constructs: *perceived usefulness* (PU) and *perceived ease of use* (PEU). In Arabic language education, TAM is relevant to understanding how teachers and students perceive mobile applications as learning media. PU refers to the belief that technology improves learning performance, while PEU refers to the belief that technology is easy to use (Marangunic & Granic, 2015; Mejía-Mancilla & Mejia-Trejo, 2024).

The implementation of TAM in Islamic-based schools in Palu shows that motivation to use Arabic language learning applications is strongly influenced by perceived benefits and ease of use. In an era where conventional methods are increasingly becoming less popular, adopting technology is seen as a relevant and practical solution (Oamen et al., 2023). Empirically, research in various post-COVID-19 contexts confirms that perceived quality and motivation are important factors in the use of Arabic language learning applications, *smartphone* for language learning (Mejía-Mancilla & Mejía-Trejo, 2024). This model explains technology acceptance through attitudes toward its use, behavioral intentions, and actual use, all of which are interrelated. Thus, TAM is an effective theoretical framework for analyzing stakeholders' readiness and response to MALL in Arabic language learning.

C. The Views of Constructivist Learning Theory in Arabic Teaching and Learning

Constructivist learning theory emphasizes active student involvement and personalized learning experiences. Knowledge is constructed through interaction, collaboration, and direct involvement, in line with *experiential learning* (Kolb, 1984). In Arabic language learning, constructivism is relevant because it encourages problem-solving, contextual learning, and real-world engagement (Nurdin et al., 2023; Tom, 2024). This method facilitates discovery-based learning that enhances student understanding, especially for beginners (Wahyuni et al., 2023).

Integration of constructivism with other approaches, such as *communicative language teaching* and *collaborative learning*, has been shown to strengthen student engagement and application of Arabic in real contexts (Almelhes & Alsaiari, 2024). A constructivist-based reading skills model with stages *Exploration, Explanation, Elaboration, Evaluation.* It is also effective in increasing student interest (Hamdy & Ningsih, 2024). In Islamic education, the integration of constructivism with digital technology is considered capable of enriching the learning experience and addressing contemporary challenges (Al Dwairi, 2024).

In the context of MALL, constructivism explains how students construct Arabic language knowledge through interactions with digital applications. Three key aspects stand out. First, active interaction between students and technology strengthens linguistic and cultural competence, creating an immersive and personalized learning experience. *Interactive-Communicative Learning* has been shown to improve students' speaking fluency, vocabulary, and self-confidence (Maryani & Hasanuddin, 2025). Second, technology-enabled learning environments, including AI-based tools, provide continuous feedback to address challenges such as complex grammar and dialect differences (Mulyanto et al., 2024). Third, the use of mobile applications supports independent learning, aligning with students' cognitive abilities, while increasing motivation and interaction (Sarah et al., 2024; Arni et al., 2025).

Although the constructivist approach has great potential, some educators argue that the traditional behaviorist approach is still relevant, especially in the early stages of learning, which require structured guidance. Therefore, effective Arabic language learning strategies in the digital age need to combine the advantages of constructivism with conventional teaching principles, thus accommodating diverse learning styles and student needs.

Based on the MALL, TAM, and constructivist theory studies, researchers view the use of mobile applications in Arabic language learning as an innovation that offers flexibility, interactivity, and student-centered learning. Mobile applications enable access to materials anytime and anywhere, support personalized learning, and enrich the learning experience with multimedia content. In line with the TAM principles, the perceived ease and usefulness of the application can increase user acceptance. Meanwhile, constructivist theory emphasizes that this technology encourages

students to actively construct knowledge through contextual activities, making it relevant to support effective and sustainable Arabic language learning in madrasas. While constructivist methods show a promising future, some educators argue that traditional behaviorists' approaches may still hold value, particularly in structured learning environments where clear guidance is necessary for foundational skills.

III. Research Method

This research uses a *mixed methods* approach to obtain a comprehensive picture of the use of mobile applications in Arabic language teaching and learning. This approach combines quantitative and qualitative data collection techniques to integrate numerical data from the survey with the personal experiences of stakeholders (*stakeholders*).

A. Research Participants

The study was conducted in five Islamic schools (madrasahs) in Palu City, Central Sulawesi, involving Arabic language teachers, students, school administrators, and parents. The madrasahs were selected purposively as these schools were considered to have implemented hybrid type of Arabic teaching approach. Meanwhile, teachers were selected to provide in-depth insights into strategies for integrating mobile applications into teaching, while students were involved to record their learning experiences. Administrative staff and parents were included to assess institutional support and household perspectives. The quantitative sample consisted of 125 survey respondents (36 Arabic language teachers, 8 administrative staff, and 81 parents) who were randomly selected through a mail distribution with *Google Form* by Arabic language teachers at the relevant madrasahs. To enrich the qualitative data, interviews were conducted based on *Google Form* with 46 students using the *semi-structured interview* format.

B. Data Collection Techniques

Data collection consisted of three main steps. First, prior to the online survey, the researchers met the Arabic teachers to provide a general view of Arabic teaching and learning in the selected madrasahs. Second, an online survey based on *Google Form* was used to collect quantitative data related to the stakeholders' level of awareness, perceptions, challenges, and suggestions for improvement in the use of mobile applications. A Likert-scale questionnaire was sent to relevant teachers, administrative staff, and parents. Finally, interviews were conducted using *semi-structured* interview format with students to explore their perspectives in depth. The interview questions covered the awareness of mobile applications, perceived benefits in improving Arabic language skills, challenges faced, and suggestions for developing application features.

C. Data Analysis

Quantitative analysis was conducted using descriptive statistics (mean, standard deviation) to identify general patterns, as well as correlation analysis to test relationships between variables, for example between frequency of use and perceived learning effectiveness. This process was assisted by SPSS version 23 software. Qualitative data from interviews were analyzed using *thematic analysis* based on four main indicators in the survey. The process *coding* conducted to identify key themes, which were then compared across respondent groups to see similarities and differences in perspectives.

Triangulation was applied to combine quantitative and qualitative results, so that the analysis not only presents numerical data but also the context and meaning behind it. This approach ensures that the research findings illustrate the challenges, opportunities, and direction of Arabic language learning technology development that aligns with Islamic educational values in Palu.

D. Ethical Considerations

Ethical considerations become an important part in the implementation of the research. All participants were given *informed consent.* This information explains the purpose, procedures, participants' rights, and guarantees confidentiality. Participation is voluntary, and participants can withdraw at any time without consequence. The collected data will be stored securely and accessible only to the research team.

E. Research Limitations

Research limitations cover a specific regional focus so that the findings may not be generalizable to other regions, as well as the use of data that is of a *self-reported* potentially containing perceptual bias. Nevertheless, this methodology is designed to provide a robust and in-depth exploration of the use of mobile applications in Arabic language learning in madrasas, taking into account diverse stakeholder perspectives.

IV. Findings

This section summarizes findings on the use of mobile apps in Arabic language learning in madrasahs in Palu, collected through surveys of teachers, administrators, and parents, as well as interviews with teachers and students. Quantitative data reveal general trends, while qualitative insights add context. The research findings discuss the types of apps, perceived effectiveness, challenges, and suggestions for improvement, aiming to guide Arabic language

instruction that is culturally relevant, technology-integrated, and aligned with Islamic educational values in Central Sulawesi.

TABLE 1
THE AWARENESS OF RESPONDENTS ABOUT THE USE OF MOBILE APPS IN ARABIC LANGUAGE LEARNING

		I am aware of the mobile apps commonly used for teaching Arabic in madrasahs	I regularly use mobile apps for Arabic language learning in my madrasah	I believe that the mobile apps available are sufficient for teaching Arabic language skills	Total.X1
N	Valid	126	126	122	125
	Missing	0	0	4	1
Mean		3.67	3.34	3.69	10.62
Median		4.00	3.00	4.00	11.00
Mode		4	4	4	12
Std. Deviation		1.277	1.154	1.029	3.287
Variance		1.632	1.331	1.059	10.803
Sum		462	421	450	1327

Based on the data, respondents showed a fairly high level of awareness of the use of mobile applications in Arabic language learning, with an average score approaching 4 (Agree) on all three main indicators. The highest average score was found in the belief that available applications are sufficient to teach Arabic language skills (Mean = 3.69), followed by awareness of commonly used applications (Mean = 3.67), while routine use of applications showed the lowest score (mean = 3.34), which indicates that although respondents are aware of the existence and benefits of applications, their use in practice is still not optimal.

TABLE 2
PERCEPTION OF RESPONDENTS DEALING WITH MOBILE APPS FOR ARABIC LEARNING

	I believe that mobile apps help students improve their Arabic language skills	I believe that students engage more actively with Arabic language content through mobile apps	I believe that students find mobile apps to be effective tools for learning Arabic	Total.X2
N Valid	124	124	124	124
Missing	2	2	2	2
Mean	3.84	3.81	3.790	11.31
Median	4.00	4.00	4.000	12.00
Mode	4	4	4.0	12
Std. Deviation	1.031	.960	1.0063	2.972
Variance	1.063	.922	1.013	8.835
Sum	476	472	470.0	1403

The data also showed that respondents' perceptions of the use of mobile applications in Arabic language learning were very positive, with the average score for all three statements above 3.7 and the median and mode consistently at 4 (agree). This indicates that the majority of respondents believe that mobile applications help improve Arabic language skills, encourage student engagement, and are effective learning tools. The relatively low level of dispersion in the data (standard deviation below 1.1) also indicates consistency in these positive perceptions.

TABLE 3
THE VIEWS OF RESPONDENTS ABOUT THE CHALLENGES AND BARRIERS FACED BY ARABIC TEACHERS IN THE IMPLEMENTATION OF MOBILE APPS IN MADRASAHS

	There are significant challenges in implementing mobile apps in teaching Arabic	Limited access to technology hinders the use of mobile apps in madrasahs	Training for teachers on how to effectively use mobile apps is inadequate	Total.X3
N Valid	124	123	124	124
Missing	2	3	2	2
Mean	3.67	3.54	3.59	10.57
Median	4.00	4.00	4.00	11.00
Mode	4	4	4	12
Std. Deviation	1.026	1.073	1.119	2.797
Variance	1.052	1.152	1.252	7.824
Sum	455	435	445	1311

Meanwhile, the results indicate that respondents recognize significant challenges in implementing mobile applications for Arabic language learning, with the average score for all three statements above 3.5 and the median and mode consistently at 4 (Agree). This reflects that limited access to technology in madrasahs and the lack of teacher training are considered major obstacles. This consistency of perception is reinforced by the relatively low distribution of data, indicating that views on these challenges are fairly evenly distributed among respondents.

TABLE 4
THE VIEWS OF RESPONDENTS DEALING WITH SUGGESTIONS FOR IMPROVEMENT IN THE USE OF MOBILE APPS IN ARABIC TEACHING AND LEARNING

	Stakeholders should provide more resources to support the use of mobile apps in Arabic teaching at madrasahs	Regular training sessions for teachers on mobile app usage should be provided	Collaboration among stakeholders (teachers, students, administrators) is essential to improve mobile apps usage	Total.X4
N Valid	124	124	124	124
Missing	2	2	2	2
Mean	3.86	3.94	4.04	11.58
Median	4.00	4.00	4.00	12.00
Mode	4	4	4	12
Std. Deviation	1.136	1.212	1.206	2.950
Variance	1.290	1.468	1.454	8.701
Sum	479	489	501	1436

The data indicate that respondents strongly support increased resource support and training for the use of mobile applications in Arabic language teaching, with a very positive average score above 3.8 for all three statements. The highest average score was found for the importance of collaboration between stakeholders (mean = 4.04), indicating a strong belief in the importance of cooperation in increasing the effectiveness of application use. With a median and mode consistently at 4, and a relatively low variance, this reflects a nearly uniform view among respondents regarding the need for more support for the use of mobile applications in learning in madrasahs.

TABLE 5
THE CORRELATIONS AMONGST THE ISSUES INVESTIGATED

		The Awareness of stakeholders	Perception of stakeholders	Challenges and barriers	Suggestions for improvement
The Awareness of Mobile apps in Arabic teaching and learning	Pearson Correlation	1	.852**	.760**	.736**
	Sig. (2-tailed)		.000	.000	.000
	Sum of Squares and Cross-products	1339.568	983.637	825.185	843.484
	Covariance	10.803	7.997	6.709	6.858
	N	125	124	124	124
Perception of stakeholders about the effectiveness of mobile apps in Arabic teaching and learning	Pearson Correlation	.852**	1	.804**	.827**
	Sig. (2-tailed)	.000		.000	.000
	Sum of Squares and Cross-products	983.637	1086.734	822.669	891.355
	Covariance	7.997	8.835	6.688	7.247
	N	124	124	124	124
Views on Challenges and barriers faced in the implementation of mobile apps in Arabic learning and teaching	Pearson Correlation	.760**	.804**	1	.786**
	Sig. (2-tailed)	.000	.000		.000
	Sum of Squares and Cross-products	825.185	822.669	962.347	797.774
	Covariance	6.709	6.688	7.824	6.486
	N	124	124	124	124
Views on Suggestions for improvement of the use of mobile apps in Arabic teaching and learning	Pearson Correlation	.736**	.827**	.786**	1
	Sig. (2-tailed)	.000	.000	.000	
	Sum of Squares and Cross-products	843.484	891.355	797.774	1070.194
	Covariance	6.858	7.247	6.486	8.701
	N	124	124	124	124

**. Correlation is significant at the 0.01 level (2-tailed).

Based on the Pearson correlation data analysis provided regarding the use of mobile applications in Arabic language learning, here is a comprehensive analysis covering awareness, perceptions, challenges, and suggestions for improvement. The sample size of the current research is quite large and consistent: N = 124–125 respondents analyzing indicators covering the awareness of Mobile Apps in Arabic teaching and learning, the perception of stakeholders about the effectiveness of the mobile apps in the Arabic teaching and learning, potential challenges and barriers that the Arabic teachers and students may face during the teaching and learning with the mobile apps. In addition, suggestions for improvement were investigated to better understand what the Arabic teachers and students alike need in their learning with the mobile apps. Table 6 showed the result of Pearson Correlation Analysis.

TABLE 6
PEARSON CORRELATION ANALYSIS

Correlation between variables (r)	Pearson Correlation	General interpretation: Relationship (r) Interpretation
Awareness of Mobile Apps use ↔ Perception of stakeholders about the effectiveness of mobile apps use	.852	Very strong and positive correlation
Awareness of Mobile Apps use ↔ Challenges and Barriers faced in Mobile Apps use	.760	Strong and positive correlation
Awareness of Mobile Apps use ↔ Suggestions for Improvements in Mobile Apps use in teaching	.736	Strong and positive correlation
Perception of stakeholders about the effectiveness of mobile apps use ↔ Challenges and Barriers faced in Mobile Apps use	.804	Very strong correlation
Perception ↔ Suggestions for Improvements in Mobile Apps use in teaching	.827	Very strong correlation
Challenges and Barriers faced in Mobile Apps use ↔ Suggestions for Improvements in Mobile Apps use in teaching	.786	Very strong correlation

Correlation analysis showed all values were significant at $p < 0.01$, indicating the relationships were not due to chance. Combining quantitative survey data and qualitative interview insights provides a comprehensive overview of awareness, perceptions, challenges, and suggestions for improvement regarding the use of mobile apps in Arabic language learning in Palu madrasas. This combined analysis connects statistics with students' actual experiences, offering both general trends and nuanced details. The findings are organized into four key indicators that form the core of the investigation.

A. The Awareness of Stakeholders on the Mobile Apps Use in Arabic Teaching and Learning

The survey results indicate that awareness among school stakeholders—teachers, principals, staff, students, and parents—regarding mobile apps for Arabic language learning in Palu madrasas is quite high. This indicates a general understanding of the role of technology, particularly mobile apps, as a valuable learning tool. The correlation between awareness and perception is very strong ($r = 0.852$), indicating that greater knowledge of these apps goes hand in hand with more positive attitudes toward their benefits. Therefore, the awareness is not passive knowledge but an active driver of adoption. The same awareness correlates strongly with identifying challenges ($r = 0.760$) and offering suggestions for improvement ($r = 0.736$), reflecting a constructive outlook that combines recognition of benefits with the ability to critically assess weaknesses.

Qualitative interviews corroborate these findings. Students who had used Arabic language learning apps reported improved vocabulary (P6), flexible learning anytime and anywhere (P11), and increased motivation for independent learning (P27, P34). This suggests that awareness is reflected in active learning behavior. However, disparities exist: some students (P39, P19) had never used the apps, indicating unequal awareness and access. Factors such as inadequate devices, limited digital literacy, unintegrated curriculum policies, and economic constraints were cited as possible causes.

Therefore, while awareness is strong, its distribution is uneven, limiting its potential. High awareness must be combined with equitable access, digital literacy training, and supportive policies to ensure inclusive use. Without these measures, awareness risks remaining untapped potential. These findings highlight that awareness is foundational to positive perceptions and a catalyst for practical improvements, but its impact is only achieved if supported by a systemic strategy that enables all stakeholders to actively and effectively use mobile apps in Arabic language learning.

B. Stakeholder Perception on the Use of the Mobile Apps in Arabic Teaching and Learning

The survey results revealed a high correlation between positive perceptions of mobile applications for Arabic language learning and suggestions for improvement ($r = 0.827$). This figure indicates that students, teachers, and other stakeholders who have a positive view of the application not only appreciate its benefits but also tend to actively provide constructive feedback for its development. In other words, positive perceptions in this context are proactive: those who see the application's value are not simply passive recipients but active partners in the process of improving the learning technology. This is important because the process of technology adoption in schools does not stop at the use stage; it needs to be accompanied by feedback that can strengthen its relevance and effectiveness.

Qualitative data from interviews complemented these quantitative findings. Many students described mobile apps as flexible, easily accessible, and providing a wider variety of materials than conventional learning methods (P9, P33). This flexibility allows students to learn at their own pace, whether at home, on the go, or in between other activities. The rapid access and availability of diverse materials were also seen as helpful in strengthening vocabulary, grammar, and reading skills in Arabic. These findings align with literature that confirms that positive perceptions of educational technology are often driven by its adaptability and independence from space and time.

However, interviews also revealed that positive perceptions were not universal. Some students preferred face-to-face learning with a teacher (P30). They felt that direct interaction provided opportunities for spontaneous questions, in-depth explanations, and emotional motivation to learn—things that digital applications are difficult to replace.

Meanwhile, other students reported difficulty understanding the material when having to translate without teacher guidance (P42). These challenges demonstrate that while mobile applications offer convenience, there are still barriers to conceptual understanding for some students, especially those with different learning styles such as students with auditory and kinesthetic learning styles which requires direct interaction. The latter types of students are only able to understand learning materials throughout the activities of listening, moving, and direct interaction.

This variation in learning preferences is an important signal for policy designers and application developers. Effective learning technology in madrasahs cannot be one-size-fits-all (*one-size-fits-all*), but must consider the diversity of learning styles, learning habits, and emotional needs of students. Integration between application-based learning and face-to-face methods (*blended learning*) can be a solution that accommodates both groups: those who enjoy the flexibility of technology and those who need direct support from teachers.

Thus, the high level of positive perception of mobile applications should be leveraged as a foundation for developing balanced and inclusive learning models. When this perception is coupled with opportunities for student and teacher feedback, application development can be more responsive to real-world needs. This strategy not only strengthens technology acceptance among users but also ensures that the resulting innovations are truly relevant, effective, and sustainable in improving the quality of Arabic language learning in madrasahs.

C. Challenges and Barriers Faced in the Use of Mobile Applications in Arabic Teaching and Learning

The quantitative analysis results show that the challenges faced by stakeholders in using mobile applications for Arabic language learning have a high correlation with the level of awareness ($r = 0.760$), perception ($r = 0.804$), and suggestions for improvement ($r = 0.786$). This correlation indicates that the greater a person's understanding and awareness of the application, the greater their ability to accurately identify obstacles and formulate relevant solutions. In other words, the challenges detected are not merely passive complaints, but rather a reflection of a deep understanding of the application's working mechanisms and potential. This emphasizes the importance of technological literacy among users, because only with adequate understanding can problems be accurately described and responded to with targeted improvement strategies.

Qualitative findings from student interviews provide a more detailed picture of these challenges. One of the main obstacles frequently mentioned was an unstable internet connection (P24), which disrupted the smooth running of app-based learning, especially when accessing video materials or interactive content that requires high bandwidth. Furthermore, the limited availability of adequate devices was also a significant barrier. Some students lacked smartphones with sufficient specifications to run apps optimally or had to share devices with other family members, limiting learning time.

Other technical issues include slow app loading times (P30), which can reduce students' motivation to learn consistently. Meanwhile, from a pedagogical perspective, some students reported difficulty understanding grammar without direct teacher explanations (P2). This suggests that app-based learning, while rich in resources, still requires contextual guidance and explanations, especially for complex material. These challenges are compounded by barriers to learning motivation, such as impaired focus or distractions when using mobile phones (P1), which can result in less effective learning.

Interestingly, despite facing these obstacles, many students still view mobile apps as a potential learning tool. This view reflects the existence of *growth mindset* amongst users, there is a belief that challenges are not permanent obstacles, but rather opportunities to find better solutions. This is relevant to the finding that challenges are positively correlated with suggestions for improvement, suggesting that obstacles can actually be a catalyst for innovation and adaptation.

Therefore, strategies to address these challenges need to be multidimensional. From a technical perspective, improving internet network infrastructure in schools and at students' homes is a priority. Optimizing application design to be lighter and more *user-friendly* for *low-spec devices* can also help expand accessibility. From a pedagogical perspective, integrating app-based learning with intensive teacher guidance can address material comprehension challenges. Teachers can provide guidance on effective app use, clarify difficult concepts, and monitor students' learning progress.

With a combination of technological advancements, improved app design, and pedagogical support, these challenges can be transformed into opportunities to strengthen the effectiveness of mobile app-based Arabic language learning. These findings confirm that the success of educational technology implementation depends not only on software quality but also on infrastructure readiness and the active involvement of all parties in the learning process.

D. Suggestions for Improvement in the Use of Mobile Applications in Arabic Teaching and Learning

Survey results showed that improvement suggestions correlated highly with awareness, perception, and challenges. This indicates that respondents who provided constructive ideas generally had direct experience using the app and a deep understanding of its strengths and weaknesses. This correlation also confirms that strong digital literacy enables users not only to enjoy the app's benefits but also to critically assess areas for improvement.

Qualitative findings from student interviews reinforced this data with practical input. One key suggestion was the addition of an offline access feature to address the often unstable internet connection. Several students emphasized the need for a bug-free application capable of running on a variety of devices, including low-spec devices (P1). There was

also input on the addition of interactive quizzes aligned with the madrasah curriculum to make learning more focused and enjoyable (P2, P6).

Furthermore, students proposed combining app-based learning with face-to-face learning to bridge the need for direct interaction with teachers, especially for material requiring in-depth explanations. Several respondents also highlighted the importance of improving teacher capacity through training in creating engaging digital content and strategies for integrating apps into lesson plans. Thus, app improvements should not only focus on technical aspects but also encompass pedagogical dimensions and human resource development. This comprehensive approach is believed to increase the app's effectiveness and acceptance among both teachers and students.

TABLE 7
COMPARISON OF SURVEY AND INTERVIEW FINDINGS

Aspect	Survey Findings (Quantitative)	Interview Findings (Qualitative)
Awareness	High; strong correlation with perception (r=0.852) and suggestion (r=0.736)	Some students found the app helped with vocabulary, flexibility, and motivation; some had never used it before.
Perception	Positive; high correlation with improvement suggestions (r=0.827)	Many find the application flexible and varied, but some prefer face-to-face or have difficulty without teacher guidance.
Challenge	High correlation with all aspects (r=0.760–0.804)	Slow internet, limited devices, app bugs, grammar difficulties, distractions
Improvement Suggestions	High correlation with awareness, perception, and challenge	Feature proposal *offline*, bug-free app, interactive quizzes, teacher training, face-to-face + app combination

The combination of survey and interview data shows that the awareness of stakeholders, their perception, the challenges and suggestions for improvement are closely interrelated. Students with a high level of awareness tends to have a positive perception and is better able to identify specific challenges, and provides more relevant advice. Conversely, low awareness can lead to a lack of hands-on experience and a lack of contribution in providing development ideas. The interview excerpts help illustrate this relationship. For example, P6, who had a high level of awareness of the app, was able to explain its benefits in detail and suggest a combination of learning methods. P24, who experienced internet difficulties, was able to suggest a solution in the form of an offline feature. Conversely, P39, who had never used the app, was unable to provide detailed suggestions, indicating that *hands-on* experience is key to generating quality feedback.

V. DISCUSSION

This study confirms that integrating Mobile-Assisted Language Learning (MALL), the Technology Acceptance Model (TAM), and constructivist learning theory provides a comprehensive framework for understanding mobile application use in Arabic language learning at madrasas in Palu City. MALL highlights flexibility, mobility, and interactivity; TAM emphasizes perceived usefulness and ease of use; and constructivism stresses students' active engagement in building knowledge. Findings reveal that applications such as *Takallam* enhance speaking skills, vocabulary, and offer flexible learning aligned with Palu's context.

From a TAM perspective, perceived usefulness and ease are decisive in adoption, with a strong correlation between perceptions and improvement suggestions (r = 0.827). This suggests that acceptance is dynamic, linked to ongoing efforts to refine implementation. Teachers and students embrace mobile applications not merely for convenience, but for their proven benefits in supporting language proficiency, affirming Davis's (1989) view on the role of perceived usefulness and ease in technology adoption.

Furthermore, the findings of this study confirm the contribution of constructivism to technology-based learning. Interactive mobile applications enable students to independently construct understanding through hands-on practice and digital communication. This approach aligns with Vygotsky's (1978) perspective, which emphasizes the importance of social interaction and active engagement in the learning process. With the support of AI-based technology, students gain greater confidence in using Arabic, both orally and in writing, as they gain a personalized and meaningful learning experience.

Stakeholder awareness plays a crucial role in mobile application use. Data indicate that teachers, students, parents, and madrasah administrators demonstrate high awareness (average 3.67), with a very strong correlation between awareness and perception (r = 0.852). Greater knowledge and understanding foster more positive views of effectiveness, extending beyond awareness to psychological readiness and direct experience. This supports a learning ecosystem open to digital innovation, especially when paired with continuous training and best practices. Moreover, Arabic teachers' perceptions drive active engagement and constructive feedback. Positive perceptions not only increase application usage but also stimulate participation in improvements. The strong correlation between perceptions and awareness of challenges (r = 0.804) shows that teachers critically evaluate and reflect, making perceptions an indicator of collaborative involvement in developing technology-based solutions in madrasas.

This study also found that challenges in using the application were viewed not merely as obstacles, but as opportunities. Limited access to devices, minimal teacher training, and uneven infrastructure actually encouraged the emergence of adaptive strategies from educators. The high correlation between challenges and perceptions (r = 0.804) and challenges and suggestions for improvement (r = 0.786) indicated that teachers viewed difficulties as part of the

learning process that fosters creativity and critical thinking. This aligns with the constructivist principle that obstacles can strengthen understanding and problem-solving skills.

Stakeholders' suggestions for improvement, with an average score of 3.94–4.04, included regular training, infrastructure improvements, cross-stakeholder collaboration, and adapting app content to local curricula, reflecting a sustainability orientation. Correlations between suggestions and awareness (r = 0.736), perception (r = 0.827), and challenges (r = 0.786) confirmed that these recommendations were rooted in real-world experiences, not simply abstract ideas.

However, this study has limitations because it only covered madrasahs in Palu, and the perception data is potentially subject to subjective bias. Therefore, further research with a broader regional scope, a longitudinal approach, and mixed methods is highly recommended. These findings confirm the synergy between MALL, TAM, and constructivism in supporting collaborative, effective, and sustainable digital-based Arabic language learning strategies.

VI. Conclusion and Implications

A. Conclusion

This study demonstrates that the use of mobile applications in Arabic language learning in madrasas has significant potential to improve learning effectiveness, motivate students, and strengthen collaboration between stakeholders. MALL, TAM, and constructivism theories complement each other in explaining the successes and challenges of implementing this technology in the local context of Palu. The interrelationship between awareness, perceptions, challenges, and suggestions for improvement emphasizes that active user involvement and in-depth understanding are key to implementation. Therefore, strategic commitment from madrasas, policy support, and the participation of all stakeholders are needed to ensure an inclusive and sustainable digital transformation of Arabic language learning based on Islamic values and the local context.

B. Practical and Strategic Implications

These findings have direct implications for various parties. Policy formulation needs to be more inclusive in implementing Arabic language learning, including the provision of adequate digital infrastructure. Evidence-based madrasah policies must be considered, accompanied by strengthening teacher training and improving digital literacy as a foundation for sustainable technology adoption. Internal and external collaboration within madrasahs is crucial for building a contextual digital ecosystem. Furthermore, the development of local Arabic language app content that aligns with Islamic values and Palu culture needs to be prioritized for better results.

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