

The Effectiveness of the Fun Easy Learn Application in Improving Arabic Vocabulary Mastery

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Abstract

The purpose of this research was to analyze the efficacy of the Fun Easy Learn app in enhancing seventh-graders' command of the Arabic lexicon (mufradat). The study used a one-group pretest-posttest design, which is a quasi-experimental approach. There were 27 participants, drawn at random from a pool of 100 pupils. Vocabulary tests were given both before and after the therapy to gather data. The three topics addressed by the instruments were animals, jobs, and body parts. The data were analyzed using descriptive and inferential statistics in SPSS version 31.0. This included tests for normality and homogeneity, as well as one-way ANOVA and paired-samples t-tests for hypothesis testing. After using the Fun Easy Learn app, pupils' vocabulary skills significantly improved, according to the findings. Scores improved from an average of 32.04 on the pretest to 67.78 on the posttest. At a significance threshold of 0.000 ($p < 0.05$), the paired-samples t-test yielded a t-value of -6.819, indicating a statistically significant difference between the pretest and posttest scores. Based on these results, it's clear that the Fun Easy Learn app helps students learn Arabic words faster. Students were more invested, enthusiastic, and motivated to study Arabic because of the app's interactive elements, including images, audio pronunciation, and educational activities. We may conclude that the Fun Easy Learn app is a useful tool for madrasah students to increase their Arabic vocabulary.

Keywords: Arabic Vocabulary; FunEasyLearn; Mobile Learning; Vocabulary Acquisition

INTRODUCTION

Today, the world has entered an era that cannot be separated from the use of technology. Every aspect of human life, including education, has undergone significant transformation as a result of advances in information and communication technology (ICT) (Rochmat et al.). Technology has become increasingly important and has evolved into an essential component of contemporary life. According to numerous studies, technology can help children overcome challenges related to emotional well-being, academic achievement, health, and learning. Technology has become an integral part of

modern education, significantly enhancing the quality of teaching and learning. It not only facilitates access to information but also improves communication between students and teachers, enables the adaptation of teaching strategies to meet individual learning needs, and allows for more objective assessment of students' academic performance. The rapid development of digital technology, coupled with the demands of the Fourth Industrial Revolution (Industry 4.0), has fundamentally transformed educational paradigms worldwide. This transformation requires a shift from traditional teacher-centered approaches toward learner-centered learning environments supported by technology (Lapisa et al., 2025; Rizal et al.). The increasing reliance on digital devices in the classroom is a defining characteristic of Industry 4.0 (Surani, 2019; Anita Candra Dewi). The use of technology has now become an integral part of the learning process, as it helps teachers design innovative learning media and facilitates students' understanding of concepts more effectively (Setiawan et al., 2023; Permana et al., 2024; Nurkamilah et al., 2020; Boyusta and Hidayati). As the demands of Industry 4.0 continue to increase, teachers are required to create learning experiences that are more relevant to the needs of the times. (Sulastri, 2022; Umami et al.).

In Indonesia's digital era, technological transformation has reshaped nearly every aspect of people's lives, particularly among the younger generation. (Afsinatun et al.). Therefore, improving the quality of education is one of the main priorities in addressing global challenges in today's digital era. Technology has played a significant role in education, and its utilization in the development of teaching materials is crucial for creating more interactive and practical learning experiences. (Kolleck et al., 2021; Roslina et al.) With the rapid advancement of technology, innovation in learning has emerged as an important area of focus in education. The use of technology in educational contexts can be implemented through the development of digital-based learning media. (Puspitarini and Magfiroh). Digitalization and technology have become commonplace in today's modern era. People routinely interact with various devices, such as computers, smartphones, laptops, and televisions, while also increasingly encountering the emergence of artificial intelligence (AI) (Sari Hernawati et al.).

The use of digital technology in foreign language learning has become an important focus of research in language education. The development of mobile devices and learning applications has contributed to the emergence of the Mobile-Assisted Language Learning (MALL) approach, which enables learners to access learning materials more flexibly and supports self-directed learning. International studies have shown that research on MALL has developed significantly and encompasses various aspects, including self-directed learning, learner autonomy, motivation, learning personalization, and the use of technology to support language learning both inside and outside the classroom. (Karakaya and Bozkurt). Therefore, the use of mobile-based language learning applications has a strong theoretical foundation in the development of modern foreign language learning.

Nevertheless, research on mobile-based language learning applications has largely focused on international languages, particularly English, as well as on widely recognized applications such as Duolingo. Research on Mobile-Assisted Language Learning (MALL) has also shown that language learning applications can be designed using various approaches, including gamification, which aims to enhance learner engagement and motivation. (Ishaq et al.). This indicates that there is still room for further

research into the implementation of language learning applications in more specific linguistic and educational institutional contexts.

In this context, the present study offers novelty by focusing on the use of FunEasyLearn in Arabic language learning at the Madrasah Tsanawiyah (MTs) level. The novelty of this study lies not merely in the use of a digital application but also in the specific context of its implementation, namely Arabic language learning within the madrasah education environment. The madrasah context has distinctive characteristics, as Arabic holds an important position in the curriculum and is closely related to students' academic needs and their understanding of Islamic sources. Therefore, the use of Arabic language learning applications needs to be examined in accordance with the characteristics of learners, learning objectives, and the educational environment of madrasahs.

FunEasyLearn is relevant to be examined in the context of Madrasah Tsanawiyah (MTs) because an application-based learning approach can provide students with more flexible learning experiences that are accessible through mobile devices. In Arabic language learning, students require continuous practice, particularly in developing vocabulary and mastering expressions. Mobile-based learning applications have the potential to support these needs by providing opportunities for repeated learning and practice beyond formal classroom instruction.

Furthermore, the use of FunEasyLearn can be understood from the perspectives of Mobile-Assisted Language Learning (MALL) and gamification. Systematic reviews of MALL and gamification-based learning have shown that mobile applications can support language learning through more interactive activities, while gamification elements can be utilized to enhance learners' interest, engagement, and motivation throughout the learning process.(Ishaq et al.). Research on gamification in language learning has also shown that game elements such as challenges, reward systems, levels, and achievement mechanisms are commonly incorporated into mobile-based language learning applications.(Shortt et al.).

However, gamification cannot be regarded as a solution that automatically improves learning outcomes. Previous research has shown that gamification design should be aligned with pedagogical objectives, as excessive use of game elements may cause learners to become more focused on game achievement than on the intended learning objectives. Therefore, research on the use of language learning applications should consider not only the attractiveness of the application but also its pedagogical relevance to learners' needs and the learning context.(Shortt et al.).

Based on the foregoing discussion, the unique contribution of this study lies in examining the use of FunEasyLearn as an Arabic language learning medium in the context of Madrasah Tsanawiyah (MTs), connecting international research developments on Mobile-Assisted Language Learning (MALL) and gamification with the specific needs of Arabic language learning within the madrasah educational environment. This study seeks to address the existing research gap, as limited studies have examined mobile-based language learning applications specifically within the context of Arabic language learning in madrasahs.

The changing demands of today's students regarding how they learn have rendered many conventional educational approaches outdated. (Bawamenewi & Waruwu, 2023; Gulo et al.). Education is an essential means of improving the quality of future generations and ensuring sustainable national development.(Sukmawati et al., 2024;

Ermiyawati et al.) To achieve educational objectives, educational technology plays an important role in facilitating the learning process.(Arni et al.). Education is a continuous process aimed at developing individuals' qualities in terms of behavior, knowledge, and skills.(Siki et al.).

Maintaining and fostering students' attention to learning presents new challenges as access to technology becomes increasingly widespread. One of the most important factors contributing to students' learning success is their personal enthusiasm for learning. Students who are enthusiastic about learning tend to be more actively engaged in their education, which in turn leads to greater motivation and academic success.(Abnan et al.). Therefore, it is believed that a strong understanding of digital literacy can help enhance learning motivation by providing access to more engaging, dynamic, and interactive educational materials.(Lathifah et al.). Digital transformation in education is fundamental, particularly as we enter the 21st century.(Setiawaty et al.). The 21st century is characterized by significant changes across various sectors of life, driven by technological advancements, globalization, and the increasingly complex dynamics of the workforce.(Sri et al.) Assessment in education serves more than simply evaluating students' performance; it also significantly influences how students learn and how teachers teach (Danial, 2020 ; Robbani et al.).

Learning is an essential component of human life, both at the individual and social levels, as it has the potential to transform and empower learners' abilities. (Muchith, 2008; Romelah et al.) Web-based learning utilizes internet technology to support the learning process, provide greater flexibility in accessing learning resources, and enable students to easily access the information they need.(Aini et al.). The relationship between teachers and students is fundamental to the learning process. It is the responsibility of educators to provide the necessary learning resources, while students are responsible for absorbing and applying those resources.(Nengsih et al.). Learning media play an essential role in the educational process, as they convey information and help students understand concepts more effectively.(henni, 2021; Fadlilah et al.).

Arabic has a complex morphological system. (Shoukry & Rafea, 2012; Alsayat & Elmitwally, 2020 ;Had and Kerinci). Arabic is a global language spoken by millions of people across various countries and holds a central position in the Islamic world. (Alanzi & Akqarni, 2022; Tahir et al.). Language studies, including Arabic, constitute a fundamental component of modern pedagogy. Learning Arabic requires skills similar to those needed to learn other foreign languages. Four essential Arabic language skills that learners need to master include speaking (maharah al-kalam), listening (maharah al-istima'), writing (maharah al-kitabah), and reading (maharah al-qira'ah). (Plagiasi and Lim Al-'arabiyyah)

In Arabic language learning, students are taught speaking, reading, listening, and writing skills, as well as grammar and new vocabulary. The continued development of Arabic language proficiency can be supported through active and creative teaching methods employed by teachers. One such method involves incorporating various games into learning activities, both inside and outside the classroom. (Pratama et al., 2025; Ira Vahlia and Afwan). In Arabic language learning, students are expected to master four language skills: listening (maharah al-istima'), speaking (maharah al-kalam), reading (maharah al-qira'ah), and writing (maharah al-kitabah).(Dedi 2021; Wahyuni et al.)

Multilingualism does not imply that an individual must have equal proficiency in every language or master all language skills in each language they know. Even native

English speakers do not necessarily possess equal proficiency in all English language skills, including listening, speaking, writing, and reading, particularly when different contexts require different skills.(Tahir et al.). Vocabulary is essential not only for everyday communication but also for understanding religious and academic texts.(Fitri et al., 2021; Linur and Supriani). Thus, the novelty of this study can be formulated in three aspects. First, this study specifically examines FunEasyLearn as a medium for Arabic language learning rather than focusing merely on the use of digital technology in general. Second, this study focuses on students at the Madrasah Tsanawiyah (MTs) level, thereby providing a research context that differs from that of many international MALL studies, which have predominantly focused on English language learning or higher education. Third, this study integrates the perspectives of Mobile-Assisted Language Learning (MALL) and gamification to examine the use of language learning applications within the context of madrasah education. Accordingly, this study is expected to contribute to the development of research on technology-enhanced Arabic language learning while also providing practical implications for the use of digital applications in Arabic language learning at the madrasah level.

METHOD

This study employed a one-group pretest-posttest design to examine the effectiveness of the FunEasyLearn application in improving the Arabic vocabulary mastery of seventh-grade students at MTsN 8 Muaro Jambi. The research participants consisted of 27 seventh-grade students from Class VIIA, selected from a population of 100 students using a simple random sampling technique. The students were administered a pretest before receiving the treatment and a posttest after participating in learning activities using the FunEasyLearn application. The treatment was conducted over five sessions and focused on Arabic vocabulary learning through three themes: animals, occupations, and parts of the body.

The one-group pretest-posttest design was selected because the study was conducted with a single class without involving a control group. The learning process consisted of three treatment sessions using the FunEasyLearn application, preceded by a pretest and concluded with a posttest. The pretest and posttest instruments consisted of 20 valid items covering the three vocabulary themes. The research data were analyzed using descriptive and inferential statistics with the assistance of SPSS version 31.0.

However, this research design has methodological limitations that need to be acknowledged. Since the study did not involve a control group, the increase in posttest scores cannot be attributed solely to the use of the FunEasyLearn application. Other factors, such as students' prior learning experiences, teacher guidance, repeated exposure to vocabulary materials, familiarity with the test format, and other learning activities, may also have contributed to the improvement in learning outcomes. Therefore, the findings of this study are more appropriately interpreted as evidence of improved learning outcomes following the implementation of the FunEasyLearn application and should not yet be regarded as definitive evidence of a causal relationship between the use of the application and improvements in students' vocabulary mastery.

To obtain stronger evidence regarding the effectiveness of the FunEasyLearn application, future research is recommended to employ a quasi-experimental design involving an experimental group and a control group with comparable characteristics. Such a design would enable researchers to compare learning gains between students who

use the FunEasyLearn application and those who receive conventional instruction or use other learning media. Studies involving larger sample sizes and multiple madrasahs are also needed to provide stronger evidence of the application's effectiveness across diverse educational contexts.

RESULTS AND DISCUSSION

This study has broader implications for the development of technology-enhanced Arabic language learning. Although the study was conducted at a single madrasah in Indonesia, the learning principles demonstrated through the use of the FunEasyLearn application are relevant to various Arabic language learning contexts in other countries. The advancement of mobile technology enables learners to access language materials more flexibly, allowing the Mobile-Assisted Language Learning (MALL) approach to be implemented in diverse educational settings where digital devices are accessible. In the global context, Arabic language learning does not take place exclusively in Arab countries but is also studied as a second or foreign language in various countries around the world. Therefore, the use of mobile-based learning applications has the potential to serve as an alternative means of supporting Arabic language learning for learners who have limited access to authentic Arabic-speaking environments. Digital applications can provide learners with opportunities to gain exposure to vocabulary, listen to pronunciation, and engage in repeated practice according to their individual learning needs.

The global implications of this study also relate to the development of more flexible and learner-centered approaches to Arabic language learning. The Mobile-Assisted Language Learning (MALL) approach enables learning to extend beyond the constraints of formal instructional time and settings. In educational contexts outside Indonesia, Arabic language learning applications can be used as supplementary learning media in schools, universities, religious educational institutions, as well as for self-directed learning. However, the application of the findings of this study to international contexts should take into account differences in culture, curricula, learner characteristics, language proficiency levels, and technological availability. The same application may not necessarily produce the same impact across different groups of learners. Therefore, cross-national and cross-context educational research is needed to examine whether the use of MALL-based Arabic language learning applications produces consistent outcomes among learners from diverse backgrounds.

Thus, the global contribution of this study lies in its effort to broaden the discussion of Mobile-Assisted Language Learning (MALL) beyond the dominance of research on English and other international languages to include the context of Arabic language learning. This study demonstrates that mobile-based learning applications can serve as an alternative supplementary medium for Arabic vocabulary learning, although their effectiveness still needs to be further examined through research employing more rigorous designs and involving more diverse educational contexts.

This study has several limitations that should be considered when interpreting the findings. First, the study employed a one-group pretest-posttest design without a control group. The absence of a control group means that the study cannot conclusively determine whether the improvement in learning outcomes was entirely attributable to the use of the FunEasyLearn application. Other factors beyond the treatment may have contributed to the increase in students' scores. Second, the study involved a relatively small number of participants, namely 27 students from a single class at MTsN 8 Muaro Jambi. This sample

size limits the ability to generalize the findings to the broader population of Madrasah Tsanawiyah students. The characteristics of students and learning conditions in other madrasahs may differ in terms of prior knowledge, technological facilities, teacher support, learning environments, and sociocultural characteristics. Third, the duration of the study was relatively short, and the treatment was implemented over only a few sessions. The limited duration does not allow for determining whether the improvement in vocabulary mastery can be sustained over the long term. Therefore, this study primarily reflects short-term changes in students' abilities following the implementation of the application. Fourth, the study focused on Arabic vocabulary mastery across three themes: animals, occupations, and parts of the body. Therefore, the findings cannot directly demonstrate the effectiveness of FunEasyLearn in developing all Arabic language skills, such as listening, speaking, reading, and writing. Fifth, this study did not systematically integrate qualitative data through interviews or structured observations. Therefore, explanations regarding students' motivation, engagement, perceptions, and experiences in using the application need to be further strengthened through qualitative or mixed-methods research.

The quantitative data in this study were analyzed using descriptive and inferential statistics. Descriptive statistics were used to determine the mean, minimum, maximum, and standard deviation of the students' pretest and posttest scores. Before conducting hypothesis testing, the normality of the data was examined to ensure that the data met the assumptions of the statistical analysis employed. Subsequently, a paired-samples t-test was conducted to determine whether there was a statistically significant difference between the students' pretest and posttest scores.

In addition to statistical significance, the magnitude of learning improvement should also be examined using an effect size measure. Therefore, Cohen's *d* for paired data is recommended to indicate the practical magnitude of the improvement in students' Arabic vocabulary mastery. Effect size analysis provides additional information beyond the *p*-value, as statistically significant results do not necessarily indicate a substantial practical effect in an educational context. The Cohen's *d* value should be calculated based on the individual pretest and posttest scores of the 27 participants to obtain an accurate estimate of the effect size.

If qualitative data are available, observations of the learning process and brief interviews with students and teachers can also be analyzed thematically to complement the quantitative findings. Qualitative analysis may focus on student engagement, motivation, participation, perceptions of the application's ease of use, and students' responses to the learning features available in the FunEasyLearn application. Integrating quantitative and qualitative findings can provide a more comprehensive understanding, not only of whether students' vocabulary scores improved, but also of how and why the application may support students' learning experiences. Testing was used as the data collection instrument in this study. Pretest and posttest assessments were administered before and after the treatment, respectively. The researchers administered a pretest to measure the students' initial abilities and a posttest to assess their abilities after the treatment.

Table 1. The Pretest And Posttest Scores Were Analyzed Using Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest	27	20	55	32,04	9,929
Posttest	27	35	100	67,78	24,311
Valid N (listwise)	27				

The descriptive statistics showed that the pretest scores ranged from 20 to 55, while the posttest scores ranged from 35 (minimum) to 100 (maximum). Following the treatment, the mean score increased from 32.04 on the pretest to 67.78 on the posttest. This finding indicates that, on average, students performed substantially better on the posttest than on the pretest. The test instrument was piloted as an initial step before being administered to the respondents. The subsequent analysis of each item was conducted based on predetermined eligibility criteria. The instrument was piloted with a group of seventh-grade students at MTsN 8 Muaro Jambi. The purpose of the pilot test was to determine whether the items were appropriate for addressing the research questions. Instrument validity and reliability testing were conducted as part of the instrument evaluation process. The validity of the instrument was assessed using SPSS version 31.0 for Windows. The level of instrument validity was determined by comparing the calculated r-value with the r-table value based on the product-moment correlation. At a 5% significance level, an item was considered valid if the calculated r-value was greater than the r-table value; otherwise, the item was considered invalid. The validity testing covered three vocabulary themes—animals, occupations, and parts of the body—which were analyzed as a single instrument. As a result, five out of the 25 items had invalid calculated r-values (< 0.381), namely Items 2, 4, 14, 21, and 22. Therefore, 20 items were considered valid and suitable for assessing students' Arabic vocabulary knowledge across the themes of animals, occupations, and parts of the body.

Reliability Assessment In this study, SPSS version 31.0 for Windows was used to assess the reliability of the test instrument. The reliability analysis covered three subthemes, which were subsequently combined into a single instrument. The results of the reliability analysis of the Arabic vocabulary mastery test instrument are presented in the table below.

Table 2. Reliability Statistics

Cronbach's Alpha	N of Items
0,738	26

The instruments covering the themes of animals, occupations, and parts of the body demonstrated acceptable reliability. The reliability analysis yielded a reliability coefficient (Cronbach's alpha) of 0.738, indicating that the instrument had an acceptable level of internal consistency. A paired-samples t-test was used to analyze the pretest and posttest results. Before conducting the t-test, several assumptions were examined to ensure the appropriateness of the analysis. The normality of the data was assessed as a prerequisite for the paired-samples t-test, followed by hypothesis testing to determine whether there was a statistically significant difference between the students' pretest and posttest scores. To determine whether the data were normally distributed, a normality test was conducted using the Kolmogorov–Smirnov test with the assistance of SPSS version 31.0 for Windows. The data were considered normally distributed if the significance (Sig.) value was greater than 0.05, whereas a significance value below 0.05 indicated that the data were not normally distributed. The results of the analysis are presented below.

Table 3. One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual	
N		27	
Normal Parameters ^{a,b}	Mean	0,0000000	
	Std. Deviation	24,16881951	
Most Extreme Differences	Absolute	0,155	
	Positive	0,095	
	Negative	-0,155	
Test Statistic		0,155	
Asymp. Sig. (2-tailed) ^c		0,095	
Monte Carlo Sig. (2-tailed) ^d	Sig.	0,091	
	99% Confidence Interval	Lower Bound	0,083
		Upper Bound	0,098

a. Test distribution is Normal.

The normality test results for the pretest and posttest scores (Sig. (2-tailed) = 0.098 > $\alpha = 0.05$) indicate that the data were normally distributed at the significance level of $\alpha = 0.05$. Thus, the findings confirm that both the pretest and posttest scores followed a normal distribution.

A homogeneity test is required when conducting an independent-samples t-test or testing hypotheses involving comparisons between groups. The data are considered homogeneous if the significance (Sig.) value is greater than 0.05, whereas a significance value below 0.05 indicates that the data are not homogeneous. The homogeneity test was conducted using SPSS version 31.0 for Windows, and the results are presented below.

Table 4. Test of Homogeneity of Variances

		Levene Statistic	df1	df 2	Sig.
Posttest	Based on Mean	1,872	4	19	0,157
	Based on Median	0,606	4	19	0,663
	Based on Median and with adjusted df	0,606	4	7,630	0,670
	Based on trimmed mean	1,745	4	19	0,182

Based on the analysis, the F-value was 1.872, with a significance value of 0.157 > $\alpha = 0.05$. Therefore, the posttest scores for the three vocabulary themes—animals, occupations, and parts of the body—were considered homogeneous at the significance level of $\alpha = 0.05$. The hypothesis testing procedure was based on the theoretical foundation and conceptual framework of the study. The hypothesis was tested using a two-tailed paired-samples t-test. The null hypothesis (H_0) stated that there was no statistically significant difference in students' Arabic vocabulary mastery between the pretest and posttest scores after using the FunEasyLearn application. Conversely, the alternative hypothesis (H_1) stated that there was a statistically significant difference between the students' pretest and posttest scores following the use of the FunEasyLearn application to learn new vocabulary. If the p-value is less than 0.05, the null hypothesis (H_0) is rejected, indicating a statistically significant difference between the pretest and posttest scores. The direction of the difference can be determined by examining the mean difference and the sign of the t-value. A positive mean difference indicates that the posttest scores were higher than the pretest scores, suggesting an improvement in students' Arabic vocabulary mastery following the treatment. The hypothesis testing was conducted using SPSS version 31.0 for Windows, as presented below:

Table 5. Paired Samples Test

		Paired Differences							Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	PRETEST POSTEST	-35,74074	27,23487	5,24135	-46,51449	-24,96699	6,819	26	0,000	0,000

The improvement in students' Arabic vocabulary mastery is indicated by the mean difference of -35.74074 in the paired-samples test. The negative mean difference indicates that the posttest scores were higher than the pretest scores, reflecting an improvement in students' vocabulary mastery following the implementation of the FunEasyLearn application. The analysis also yielded a t-value of -6.819 , with a significance value of $\text{Sig. (2-tailed)} = 0.000 \leq \alpha = 0.05$ and $df = 26$. Therefore, the null hypothesis (H_0) was rejected, indicating a statistically significant difference between the students' pretest and posttest scores. These findings suggest that the use of the FunEasyLearn application was associated with a significant improvement in students' Arabic vocabulary mastery compared with their initial level of proficiency.

The findings of this study indicate that seventh-grade students in Class VIIA at MTsN 8 Muaro Jambi demonstrated a significant improvement in Arabic vocabulary (mufradāt) mastery after using the FunEasyLearn application. This improvement is evidenced by the statistically significant difference between the pretest and posttest results. The mean score increased from 32.04 on the pretest to 67.78 on the posttest. This increase suggests that the use of the FunEasyLearn application supported students in expanding their Arabic vocabulary. In addition, the range of scores also improved, with the minimum score increasing from 20 on the pretest to 35 on the posttest, while the maximum score increased from 55 to 100 . These findings suggest that mobile application-based learning may provide greater support for students in understanding and retaining vocabulary compared with the conventional learning methods previously used in the classroom.

Nevertheless, this improvement should be interpreted with caution because the study employed a one-group pretest-posttest design without a control group. The increase in scores indicates that students' performance after the treatment was better than before the treatment; however, the research design does not allow the researchers to conclude definitively that the improvement was entirely attributable to the use of the FunEasyLearn application. Other factors, such as students' prior learning experiences, teacher guidance, repeated practice, exposure to the learning materials, and students' familiarity with the test format, may also have influenced the posttest results.

The paired-samples t-test yielded a t-value of -6.819 with a significance value of 0.000 , which is lower than the 0.05 significance level. Therefore, the null hypothesis (H_0), which states that there is no statistically significant difference between the pretest and posttest scores, was rejected, while the alternative hypothesis (H_1) was accepted. These results indicate a statistically significant improvement in students' Arabic vocabulary mastery following the implementation of the FunEasyLearn application. However, given the one-group pretest-posttest design without a control group, this improvement cannot be attributed solely to the use of the application. Prior to conducting the t-test, the assumptions underlying the statistical analysis were examined. The results indicated that the data met the normality assumption, while the homogeneity test also showed

homogeneous data across the relevant groups. Therefore, the data were considered appropriate for the subsequent statistical analysis.

These findings indicate that the implementation of the FunEasyLearn application was associated with an improvement in students' Arabic vocabulary mastery. The interactive features of the application, such as images, pronunciation audio, and game-based exercises, provide students with opportunities to recognize and practice vocabulary repeatedly. These features may also contribute to increasing students' engagement throughout the learning process.

However, statistical significance alone does not indicate the magnitude of the improvement or the strength of the observed effect. Therefore, the interpretation of the effectiveness of the FunEasyLearn application should be complemented by an effect size analysis, particularly Cohen's *d* for paired data. The Cohen's *d* value should be calculated based on the individual pretest and posttest scores of the 27 students. The resulting effect size would provide a clearer indication of whether the observed improvement represents a small, moderate, or large effect in the context of language learning.

The findings of this study should also be considered in terms of external validity. The study was conducted at a single madrasah, namely MTsN 8 Muaro Jambi, and involved 27 seventh-grade students from one class (Class VIIA). Therefore, the findings cannot be directly generalized to all Madrasah Tsanawiyah (MTs) or other educational institutions. The characteristics of students, teachers, curricula, technological facilities, learning environments, and school policies may vary across madrasahs. These contextual differences may influence the effectiveness and implementation of mobile-based learning media such as FunEasyLearn. Therefore, the findings of this study are more appropriately understood as being relevant to madrasahs with similar characteristics and learning conditions.

Despite its limitations in terms of generalizability, the findings of this study provide preliminary evidence that the FunEasyLearn application has the potential to serve as a supplementary medium for Arabic vocabulary learning in the madrasah context. The application may offer an alternative for learning environments with access to mobile devices and for teachers seeking to provide students with a more interactive vocabulary practice experience. Further research involving larger sample sizes, multiple madrasahs, and students from diverse geographical regions and educational contexts is needed to strengthen the external validity and generalizability of the findings. The learning process demonstrated that the use of the FunEasyLearn application provided students with a more interactive learning experience. The application presents Arabic vocabulary through various features, including images, pronunciation audio, and interactive exercises. These features may help students associate Arabic vocabulary with visual and auditory representations, while game-based exercises provide opportunities for repeated practice and reinforcement of the vocabulary being learned.

The use of interactive digital media also has the potential to increase students' interest and participation during the learning process. However, claims regarding improvements in students' motivation and engagement should be interpreted with caution when they are not supported by systematic observational data, interview findings, or validated motivation instruments. Therefore, future research is recommended to collect qualitative data through classroom observations and brief interviews with both students and teachers. Such data could provide deeper insights into students' learning experiences, including their perceptions of the application's ease of use, the attractiveness of its

features, the difficulties they encounter, and the application's contribution to the process of Arabic vocabulary learning.

Overall, the quantitative findings indicate a significant improvement in students' vocabulary mastery scores following the implementation of the FunEasyLearn application. However, because the study did not employ a control group and was conducted within a limited research context, these findings should be interpreted as preliminary evidence of the potential of the FunEasyLearn application rather than as conclusive evidence of a causal relationship. The use of a quasi-experimental design involving both experimental and control groups, combined with qualitative data analysis, is expected to provide stronger evidence regarding the effectiveness and applicability of the FunEasyLearn application in Arabic language learning.

CONCLUSION

Based on the findings, the implementation of the FunEasyLearn application was associated with an improvement in the Arabic vocabulary mastery of seventh-grade students in Class VIIA at MTsN 8 Muaro Jambi. The students' mean score increased from 32.04 on the pretest to 67.78 on the posttest, representing a mean increase of 35.74 points. The results of the paired-samples t-test also indicated a statistically significant difference between the students' pretest and posttest scores, with a t-value of -6.819 and a significance level of $p < 0.05$. These findings suggest that the FunEasyLearn application has potential as an interactive supplementary medium for Arabic vocabulary learning. The visual and audio features, along with game-based exercises available in the application, may provide students with opportunities to practice and reinforce the vocabulary they have learned.

However, the findings should be interpreted in light of the methodological limitations of the study. The use of a one-group pretest-posttest design without a control group limits the ability of the study to establish a definitive causal relationship between the use of the FunEasyLearn application and the improvement in students' vocabulary mastery scores. The observed improvement may also have been influenced by other factors, such as students' prior learning experiences, teacher guidance, repeated exposure to the learning materials, and familiarity with the assessment instrument. Furthermore, the study involved only 27 students from a single class at MTsN 8 Muaro Jambi. Therefore, the findings cannot be directly generalized to all madrasahs or other educational contexts. Nevertheless, the results provide preliminary insights for madrasahs with similar characteristics, particularly those seeking to integrate mobile-based learning media into Arabic language instruction. Future research is recommended to employ a quasi-experimental design involving both experimental and control groups, calculate effect sizes such as Cohen's d , and include larger samples from multiple madrasahs. In addition, qualitative data obtained through systematic classroom observations and interviews with students and teachers should be incorporated to provide a more comprehensive understanding of students' engagement, perceptions, and learning experiences. These methodological improvements are expected to strengthen the evidence regarding the effectiveness and applicability of the FunEasyLearn application in Arabic vocabulary learning and enhance the generalizability of future research findings.

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