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THE EFFECTIVENESS OF CAKE APPLICATION TOWARDS VOCABULARY MASTERY

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Abstract

This investigates the effectiveness of the Cake application in improving the English vocabulary mastery of tenth-grade students at MA Masalikil Huda Tahunan Jepara. The research responds to the ongoing issue of students' limited vocabulary despite formal English instruction. A quasi-experimental design with a non-equivalent control group was employed, using purposive sampling to select two classes consisting of 25 students each. The experimental group learned using the Cake application, while the control group received traditional instruction. Vocabulary tests were administered before and after treatment, with content validity confirmed by experts and reliability tested through Cronbach's Alpha. Data were analyzed using an independent t-test in SPSS 26 at the 0.05 significance level. Results showed a significant difference between the experimental group (M = 86.92) and the control group (M = 61.40), with Sig. (2-tailed) = 0.000 < 0.05. The experimental group also achieved a higher N-Gain score (0.70) compared to the control group (0.36), indicating substantial improvement. These findings demonstrate that the Cake application effectively enhances students' vocabulary mastery and offers meaningful insights for integrating digital tools in EFL contexts.

Keywords: Cake application, Digital-based learning, Mobile-assisted language learning (MALL), Vocabulary mastery

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INTRODUCTION

Vocabulary mastery is a crucial component of English proficiency, as it supports learners' ability to develop skills in listening, speaking, reading, and writing. Nation (2022) asserts that vocabulary forms the foundation of language competence, while Alqahtani (2020) emphasizes that insufficient vocabulary remains one of the most persistent challenges for EFL learners. In the Indonesian context, this issue is reflected in the 2023 English Proficiency Index, which places Indonesia in the low-proficiency category, ranking 81 out of 113 countries EF EPI (2023) The limited availability of authentic learning resources and the lack of contextualized vocabulary instruction further contribute to students' difficulties in acquiring vocabulary effectively (Pratama et al., 2025; Zein, 2022). With the development of technology, mobile-assisted language learning (MALL) is an alternative in supporting English language learning. Digital-based applications such as Duolingo, Memrise, and Cake are widely used because they provide interactive, flexible, and contextual learning experiences (Telaumbanua et al., 2024). According to Burston (2022), MALL offers unlimited access to learning in terms of time and place, therefore supporting independent learning. This is supported by Metruk (2024), who found that MALL increases student motivation to learn and accelerates vocabulary acquisition.

Cake, as a popular language learning application, offers content in the form of authentic videos, pronunciation exercises, and vocabulary learning based on everyday contexts. Research by Septriani (2025) shows that the use of Cake significantly improves junior high school students' vocabulary mastery compared to traditional methods. Hatuina and Astutik (2024) also found that the Cake app can generate learning engagement and improve students' vocabulary achievement. In addition, Paramita et al. (2022) research confirms that Cake is more effective than conventional methods because it combines visual and audio contexts at the same time.

Similar findings were observed in a study conducted by Hatuina and Astutik (2024), which revealed that utilizing the Cake app greatly enhanced students' motivation and vocabulary growth. Consequently, this application can serve as a supplementary tool to boost English vocabulary proficiency within formal education in Indonesia. Research by Klimova and Polakova (2020) also backs up these results, demonstrating that employing

the MALL application can foster vocabulary acquisition outcomes in an online classroom setting. Raharjo (2022) expressed a similar opinion, stating that interactive application-based learning encourages more active student participation. Kristanti et al. (2024) have suggested that vocabulary improvement through digital applications needs to be interpreted using relevant

Several researchers learning theories. Multimodal learning theory, for example, argues that combining visual, auditory, and contextual inputs helps learners process and retain vocabulary more effectively. Likewise, scaffolding theory suggests that supportive tools such as interactive apps can provide step-by-step assistance that gradually leads learners toward independence. Yet, few studies have connected Cake-based vocabulary improvement with these theoretical perspectives, leaving a gap in the literature.

Previous research has also shown methodological limitations. Nur Aisyah & Repelita Waty Br Kembaren (2025) focused on speaking skills rather than vocabulary, while Samai (2025) emphasized that many application-based studies lack strong experimental designs. Figueiredo (2023) also highlights the importance of using quasi-experimental methods to provide more valid evidence of effectiveness. Thus, although several studies confirm the benefits of Cake, research employing a rigorous quasi-experimental design in the context of Islamic senior high schools is still limited. Therefore, a study is needed that not only examines the effectiveness of Cake through a stronger experimental design but also investigates its use specifically within a madrasah environment, where instructional characteristics and learning culture may differ significantly from general school contexts.

Building on this gap, the present study is designed to address these limitations by implementing a quasi-experimental method with an equivalent control group, allowing for a more accurate comparison between Cake-based learning and traditional instruction. This study also incorporates multimodal learning and scaffolding theories to explain not only whether improvement occurs, but how and why the application supports vocabulary development. Furthermore, by situating the research in an Islamic senior high school, an educational context rarely examined in MALL studies, this study offers novel contributions in terms of context, methodological rigor, and theory-driven interpretation of the mechanisms through which Cake enhances students' vocabulary mastery. This approach is in line with the findings of Klimova and Polakova (2020) that Islamic-based educational institutions also need to integrate technology into language learning. Mar (2024) highlights that utilizing digital technology in Islamic education has the potential to enhance the effectiveness of student learning results.

The primary goal of this research is to assess if utilizing the Cake application greatly influences the vocabulary skills of students. Moreover, this study seeks to find out if digital media-based on applications is more advantageous than traditional learning approaches in enhancing students' vocabulary. In connection with this, a study by Fageeh (2023) shows that the MALL application can increase learning effectiveness compared to traditional methods. Research conducted also reinforces that the integration of digital applications in vocabulary teaching produces higher achievements. From a theoretical standpoint, this research adds to the field of mobile-assisted language learning (MALL) studies, especially regarding vocabulary learning. Practically, the findings of this research are anticipated to guide teachers, educational institutions, and policymakers in incorporating digital tools into English language education to enhance student achievement. This aligns with the conclusions drawn by Su & Zou (2022)who mentions that using technology in language instruction can help close the educational divide.

RESEARCH METHOD

This study employed a quantitative approach using a quasi-experimental design with a non-equivalent control group to examine the effectiveness of the Cake application in improving students' vocabulary mastery. The participants were tenth-grade students at MA Masalikil Huda Tahunan Jepara, consisting of 50 learners aged 15–16 years with generally comparable English proficiency levels based on their previous semester's grades and diagnostic vocabulary screening. Purposive sampling was used to select two classes with similar academic characteristics: class X-1 as the experimental group and class X-2 as the control group, each consisting of 25 students. The treatment was carried out over four weeks, comprising eight sessions of approximately 40 minutes each. During the treatment, the experimental group used the Cake application through guided activities such as watching short authentic videos, practicing target vocabulary with pronunciation feedback, completing repetition drills, and engaging in short contextual exercises provided by the app. This technique was chosen so that differences in learning outcomes could be attributed to the treatment rather than other factors Siraj & Zain (2021) In contrast, the control group received instruction through traditional methods, which included reading textbook-based vocabulary lists, teacher explanation, sentence translation exercises, and paper-based drills without technological tools (Pratama et al., 2025).

The assessment instrument consisted of pre-test and post-test vocabulary measures aligned with the curriculum indicators, covering word meaning, spelling accuracy, pronunciation recognition, and context-based usage. Scoring followed a rubric that allocated points for correct meaning identification, accurate form, and appropriate use in sentence context. Content validity was ensured through expert review, and reliability was tested using Cronbach's Alpha. The collected data were analyzed using an independent t-test with a 0.05 significance level to determine whether there were statistically significant differences in vocabulary achievement between the

two groups. This analysis is commonly used in experimental language education research because it can show the significance of treatment differences (Hermawati et al., 2023).

FINDINGS

In this research, all information was gathered from scores derived from test outcomes. The investigator utilized an analysis of pre-test and post-test scores to determine variations in students' vocabulary acquisition following the use of the Cake application. To uncover these variations, a t-test was employed by the researcher. Prior to performing the t-test, normality and homogeneity tests were conducted on the data to confirm that it was normally distributed and exhibited uniform variance.

Table 1. The result of the normality test

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	kelas	Statistic	df	Sig.	Statistic	df	Sig.
hasil	pretest kelas control	.149	25	.160	.924	25	.062
	postest kelas control	.159	25	.103	.964	25	.489
	pretest kelas experiment	.201	25	.011	.941	25	.158
	postest kelas experiment	.167	25	.069	.953	25	.290

As seen in table 1, the significance value for the experimental group in the pre-test was recorded at 0. 158, whereas the control group had a value of 0.062. This indicates that the pre-test results for both groups followed a normal distribution (0.158 > 0.05; 0.062 > 0.05). For the post-test, the experimental group received a significance value of 0.290, while the control group reported 0.489. Since these significance values exceed $\alpha = 0.05$ (0.290 > 0.05; 0.489 > 0.05), it show that all significance values for both the pre-test and post-test scores exceeded 0.05, indicating that the data were normally distributed.

Table 2. The result of the homogeneity test

		Levene Statistic	df1	df2	Sig.
Result	Based on Mean	3.039	1	48	.088
	Based on Median	2.761	1	48	.103
	Based on Median and with adjusted df	2.761	1	36.038	.105
	Based on trimmed mean	3.087	1	48	.085

As seen in Table 2, a test for homogeneity was performed to assess the comparability of variance across the groups. The result of Levene's Test showed a Levene's significance value of 0.088 (> 0.05), confirming that the variances of both groups were homogeneous.

Table 3. The result of independent sample T test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
kelas	Statistic	df	Sig.	Statistic	df	Sig.

hasil	pretest kelas control	.149	25	.160	.924	25	.062
	postest kelas control	.159	25	.103	.964	25	.489
	pretest kelas experiment	.201	25	.011	.941	25	.158
	postest kelas experiment	.167	25	.069	.953	25	.290

To examine the specific variations between the scores from the pre-test and post-test, the researcher performed an Independent Samples Test. The findings indicated that the average score for the post-test in the experimental group was 86. 92, where the highest score recorded was 97, and the lowest was 73. In contrast, the control group achieved an average post-test score of 61.40, with a top score of 83 and a bottom score of 43. As a result, a notable difference was observed between the two groups. The control group obtained an average pre-test score of 38.20 and a post-test score of 61.40, while the experimental group improved from 56.52 to 86.92. These results indicate that students in both classes showed progress, but the experimental group demonstrated substantially greater improvement. According to the information in the previous table, the significance (two-tailed) value is 0.000, while the t-table value is 2.010. The independent t-test revealed a significant difference in post-test performance between the two groups ($p = 0.000 < 0.05$), demonstrating that the students who used the Cake application achieved higher vocabulary mastery than those who received traditional instruction. This indicates that the alternative hypothesis (Ha) is upheld.

Table 4. The result of N-Gain test

Class	Average		N Gain	Criteria
	Pre test	Post test		
Control	38,2	61,4	0,36	Moderate
Experiment	56,52	86,92	0,70	High

Based on the findings from the N-Gain test evaluation, the N-Gain score for the control group, where the control group achieved a moderate gain of **0.36**, while the experimental group reached a high gain of **0.70**, reflecting the stronger effect of the Cake-based intervention. This indicates that utilizing the Cake application has been shown to greatly enhance students' vocabulary abilities in comparison to traditional educational methods.

DISCUSSION

The findings of this research directly answer the research questions by confirming that the Cake application significantly enhances students' vocabulary mastery. The average score difference of 25.52 points between the experimental and control groups shows that students who used the application achieved substantial improvement. The most notable gains occurred in understanding word meaning, spelling accuracy, and pronunciation clarity, demonstrating that the application supports multiple aspects of vocabulary development. A comparison with the control group further strengthens these findings. Students who used conventional vocabulary learning methods such as memorizing lists, copying words, and reading texts, received limited exposure, less engagement, and delayed feedback. In contrast, the experimental group benefited from interactive drills, real-time feedback, contextual examples, and repeated exposure, making vocabulary practice more frequent, enjoyable, and meaningful. This explains why the traditional approach produced less improvement compared to the Cake application. Aligns with the study by Hermawati et al. (2023) which revealed that the Cake application effectively improves students' vocabulary and pronunciation.

The notable progress seen in the experimental group can be accounted for by constructivist learning theory, which stresses that students actively build understanding by engaging with their surroundings. Integrating technology through Mobile-Assisted Language Learning (MALL) provides a more interactive and meaningful learning experience. It shows the use of the Cake application offers authentic visual and auditory contexts, helping students comprehend and retain vocabulary more effectively.

The theoretical contribution of this study is significant. The findings enrich the field of MALL by providing empirical evidence that mobile applications can effectively support multimodal vocabulary learning. The results also strengthen the applicability of multimedia learning theories in EFL contexts, especially in Indonesian schools where digital learning environments are still developing. This study demonstrates that integrating technology promotes deeper processing of vocabulary, increases exposure frequency, and supports autonomous learning benefits that traditional methods often fail to provide. This result also supports the views of Burston (2022) and Metruk (2024) who stated that app-based learning enhances learners' motivation and autonomy. Through interactive features and immediate feedback, students become more emotionally engaged in the learning process.

The real-world significance of this discovery is that educators are advised to make use of digital platforms like Cake to enhance vocabulary acquisition. The findings indicate that learning through applications not only boosts educational performance but also raises students' involvement and enthusiasm more successfully than

conventional approaches. As Indonesian schools shift toward digital literacy and technological integration, applications like Cake can serve as practical and innovative tools to support vocabulary learning. Overall, this study confirms that implementing MALL through applications like Cake is an innovative strategy to improve English learning outcomes, particularly in vocabulary acquisition. The results provide an empirical foundation for developing future educational policies and strategies that promote digital learning environments in Indonesian schools.

CONCLUSION

Based on the results of the data analysis, this study confirms that the use of the Cake application provides a meaningful improvement in students' vocabulary mastery. The average post-test score of the experimental class (M = 86.92) was higher than that of the control class (M = 61.40), with the t-test results showing a Sig. (2-tailed) value = 0.000 < 0.05. Beyond it numerical gains, the findings show that mobile-based learning offers advantages in terms of increased engagement, richer exposure, and more interactive learning experiences compared to conventional methods.

The contribution of this study lies in providing empirical evidence that mobile-assisted applications can strengthen language learning practices, both theoretically by enriching the literature on Mobile-Assisted Language Learning (MALL) and practically as an innovative instructional strategy in the classroom. This suggests that technology-supported vocabulary learning can create more dynamic and student-centered learning environments.. However, this study has several limitations that need to be acknowledged. The small sample size, relatively short intervention period, and focus on a single application may limit the generalizability of the findings. Future research may address these limitations by involving larger and more diverse populations, extending the duration of the intervention, or comparing multiple educational applications to understand their relative effectiveness. Curriculum designers and school administrators are encouraged to integrate mobile-based learning tools into vocabulary instruction, support digital literacy initiatives, and provide professional development for teachers to effectively incorporate educational technology.

Overall, the broader impact of this study highlights the growing need to strengthen digital literacy and technology-enhanced learning in Indonesian EFL education. Schools can also facilitate the adoption of interactive applications like Cake to enhance students' learning outcomes and increase motivation. As classrooms continue to transition into more digital learning environments, mobile applications such as Cake can play a significant role in supporting 21st-century language learning and improving students' English proficiency in a more engaging, effective, and accessible way.

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