

GAMIFICATION, MOBILE LEARNING, AND MICROLEARNING IN VOCABULARY INSTRUCTION: THE MEDIATING EFFECT OF LEARNING MOTIVATION ON VOCABULARY MASTERY

Hanafi^{1a*}, Anita Fatimatul Laeli^{2b}

^{1,2}Universitas Muhammadiyah Jember, Indonesia

^aE-mail: hanafi@unmuhjember.ac.id

^bE-mail: anitafatimatul@unmuhjember.ac.id

(*) Corresponding author

hanafi@unmuhjember.ac.id

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ABSTRACT

This study aims to analyze the effect of Gamification Strategy, Mobile Assisted Language Learning (MALL), and Microlearning Content on Vocabulary Mastery with Learning Motivation as a mediating variable. The research used a quantitative approach with a cross-sectional survey design and an explanatory research framework. The research sample consisted of 150 students from English Language Education and English Literature Study Programs at various universities in Indonesia, selected through purposive sampling technique. Data were collected using an online five-point Likert scale questionnaire and analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method with SmartPLS software. The results showed that Gamification Strategy and Microlearning Content have a positive and significant effect on Vocabulary Mastery as well as Learning Motivation. In contrast, MALL did not show a significant effect on either variable. In addition, Learning Motivation was proven to have a significant effect on Vocabulary Mastery and to mediate the effect of Gamification Strategy and Microlearning Content, but did not mediate the effect of MALL on Vocabulary Mastery. These findings indicate that vocabulary mastery is more influenced by the quality of gamification based learning strategies and micro content than by the mere use of mobile technology, thereby confirming the importance of the role of learning motivation in supporting the effectiveness of digital based vocabulary learning.

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INTRODUCTION

The rise of digital technology in foreign language education has transformed vocabulary learning in significant ways. The Mobile Assisted Language Learning (MALL) approach plays a central role in this transformation. Through MALL, learners can access language materials whenever and wherever they wish by using mobile devices. This access

increases both the flexibility of learning and the amount of exposure to the target language. Research by Diarni and Faruk (2026) indicates that MALL is effective in improving vocabulary mastery because it provides a more interactive, adaptive, and learner-centered learning environment. Nurhayati and Suryaman (2023) also note that the use of mobile applications such as Duolingo and Quizlet in MALL is capable of improving vocabulary learning outcomes through repeated practice and immediate feedback that reinforces word retention. This confirms that MALL has become an important approach in English language learning in the digital era, particularly in the EFL context in Indonesia.

Gamification strategy is being used more frequently in language learning together with MALL. This strategy boosts how engaged students become and how motivated they are to study. The method applies game elements including points, levels, leaderboards, and challenges to make the educational experience more interactive and fun. Gamification through applications such as Quizizz and Wordwall is capable of significantly improving student motivation and vocabulary mastery because it creates a competitive yet enjoyable learning atmosphere (Mayaputri & Ekhsan, 2025). The combination of gamification with mobile apps has also been found to enhance two important elements for effective language learning, namely emotional engagement and intrinsic motivation among learners (Fithriani, 2021). Thus, Gamification Strategy not only functions as a motivational strategy, but also as a primary driver of active engagement in the vocabulary learning process.

Furthermore, the concept of Microlearning Content has become a relevant approach in supporting mobile-based learning because it presents material in small, concise, and focused units. This approach is highly suitable for the characteristics of digital learners who have limited time and relatively short attention spans. Microlearning enables structured repetition that reinforces the long-term memorization of vocabulary (Jayanti & Darmawan, 2024). In the context of MALL, microlearning also strengthens learning effectiveness because material can be consumed quickly and repeatedly through mobile devices, thereby supporting a continuous and flexible learning process.

In technology-based learning, Learning Motivation serves as a very important intervening variable in determining the success of vocabulary mastery. Learning motivation not only affects the intensity of learning application use, but also determines the consistency and quality of learner engagement in the learning process. Research by Handikaningtyas (2025) shows that the integration of gamification in MALL is capable of significantly increasing learning motivation, which subsequently has a positive impact on improving vocabulary mastery. Thus, learning motivation can be understood as a psychological mechanism that bridges the influence of digital learning strategies on language learning outcomes.

Although various studies have discussed the effectiveness of gamification, MALL, and microlearning separately, most studies still focus on the use of one particular platform without examining the integration of all three approaches within a comprehensive learning system. Previous studies in Indonesia have generally still examined Duolingo, Quizizz, or Wordwall individually in improving vocabulary, so not many have developed a learning ecosystem model that combines Gamification Strategy, Mobile-Assisted Language Learning, and Microlearning Content simultaneously. This situation indicates a significant research gap in the development of a more holistic technology-based vocabulary learning model.

Based on this gap, this study offers novelty through the development of a gamified microlearning ecosystem in the MALL context that integrates Gamification Strategy, Microlearning Content, and Mobile-Assisted Language Learning in a single vocabulary learning model. This model also positions Learning Motivation as an intervening variable to explain the mechanism of influence among variables on Vocabulary Mastery. Thus, this study not only contributes to the development of technology-based language learning theory, but also provides practical implications in designing more effective, adaptive, and digitally responsive vocabulary learning strategies suitable for learners in the digital era.

Based on these gaps, this study aims to examine the effects of Gamification Strategy, Mobile-Assisted Language Learning (MALL), and Microlearning Content on Vocabulary Mastery among Indonesian EFL learners, with Learning Motivation serving as a mediating variable. Unlike previous studies that have generally investigated these approaches separately, this study proposes an integrated framework to explain how technological and pedagogical factors jointly contribute to vocabulary acquisition. Therefore, this study offers both theoretical

contributions to technology-enhanced language learning and practical implications for developing more effective and adaptive vocabulary learning strategies in the digital era.

METHOD

This study employed a quantitative explanatory research design to examine the direct and indirect relationships among **Gamification Strategy (GS)**, **Mobile-Assisted Language Learning (MALL)**, **Microlearning Content (MC)**, **Learning Motivation (LM)**, and **Vocabulary Mastery (VM)**. A cross-sectional survey design was applied by collecting data from respondents at a single point in time through an online questionnaire.

The population consisted of undergraduate students enrolled in English Language Education and English Literature programs at several Indonesian universities who had experience using mobile-based English learning applications. Purposive sampling was employed based on the following criteria: (1) active students in semesters 2–8, (2) users of mobile-assisted language learning applications for at least three months, (3) experience with gamification and microlearning features, and (4) willingness to complete the questionnaire. A total of 150 respondents participated in the study, which satisfies the recommended sample size for Partial Least Squares Structural Equation Modeling (PLS-SEM) (Hair et al., 2021).

The research instrument was a structured questionnaire using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire measured five latent constructs: Gamification Strategy, MALL, Microlearning Content, Learning Motivation, and Vocabulary Mastery. All measurement indicators were adapted from previous validated studies and modified to fit the context of mobile-assisted English vocabulary learning. Prior to hypothesis testing, construct validity and reliability were evaluated using outer loading values, Average Variance Extracted (AVE), and Composite Reliability (CR).

Data were collected online via Google Forms over approximately one month. Primary data were obtained from respondents' questionnaire responses, while secondary data from relevant books and scholarly publications were used to support the theoretical framework and interpretation of findings.

Data analysis was conducted using SmartPLS 4 through the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. The analysis consisted of two stages: assessment of the measurement model (outer model) to evaluate convergent validity and construct reliability, followed by assessment of the structural model (inner model) to examine the proposed hypotheses. Path coefficients, coefficient of determination (R^2), t-statistics, and p-values were estimated using the bootstrapping procedure with a significance level of 0.05. Furthermore, mediation analysis was performed to examine the mediating role of Learning Motivation in the relationships between Gamification Strategy, MALL, Microlearning Content, and Vocabulary Mastery.

RESULT AND DISCUSSION

RESULT

The study classified respondent characteristics into four groups: gender, age, semester, and intensity of mobile based language learning application use. This classification was done to present a broad overview of the student sample's profile. In terms of gender, female students formed the majority with 92 respondents (61.3%), while male students accounted for 58 respondents (38.7%). Such a higher proportion of female respondents implies that female students engage with digital language learning tools more frequently compared to male students.

The majority of respondents were in the age range of 19 to 22 years, totaling 104 respondents or 69.3%, followed by ages 23 to 25 years totaling 31 respondents or 20.7%, and ages below 19 years totaling 15 respondents or 10.0%. These data indicate that the majority of respondents fall into the productive age category that actively uses digital technology in the learning process. The largest number of respondents came from semester 4 and semester 6, totaling 89 respondents or 59.3%, while the remainder came from semesters 2 and 8. This indicates that the majority of respondents had sufficient experience in participating in digital technology-based English language learning during their studies.

Furthermore, based on the intensity of mobile-based language learning application use, the majority of respondents used learning applications for 1 to 3 hours per day, totaling 81 respondents or 54.0%, followed by use of less than 1 hour totaling 42 respondents or 28.0%, and more than 3 hours totaling 27 respondents or 18.0%. These findings indicate that students are quite active in utilizing mobile technology as a supporting medium for English vocabulary learning. In addition, the majority of respondents stated that they had used gamification-based learning applications such as Duolingo, Quizizz, and Wordwall in the English vocabulary learning process. The use of these applications indicates that the respondents already had experience with the implementation of Gamification Strategy, MALL, and Microlearning Content, making them appropriate for the needs of this study.

Table 1. Outer Loading

Variable	Indicator	Gamification Strategy (X1)	MALL (X2)	Microlearning content (X3)	Vocabulary Mastery (Y)	Learning Motivation (Z)
Gamification Strategy (X1)	X1.1	0.837				
	X1.2	0.767				
	X1.3	0.796				
	X1.4	0.761				
MALL (X2)	X2.1		0.730			
	X2.2		0.884			
Microlearning content (X3)	X3.1			0.747		
	X3.2			0.761		
	X3.3			0.772		
	X3.4			0.757		
	X3.5			0.779		
Vocabulary Mastery (Y)	Y.1				0.721	
	Y.2				0.803	
	Y.3				0.786	
	Y.4				0.794	
Learning Motivation (Z)	Z.1					0.865
	Z.2					0.876
	Z.3					0.760

Source: Data processed (2026)

Based on the outer loading results, all indicators on the Gamification Strategy, MALL, Microlearning Content, Vocabulary Mastery, and Learning Motivation variables have loading values above 0.70. This indicates that all indicators are able to reflect the construct they measure well, so that all indicators are declared valid and meet the requirements of convergent validity.

Table 2. Cross Loading

Indicator	Gamification Strategy (X1)	MALL (X2)	Microlearning content (X3)	Vocabulary Mastery (Y)	Learning Motivation (Z)
X1.1	0.837	0.293	0.473	0.633	0.574
X1.2	0.767	0.275	0.436	0.529	0.466
X1.3	0.796	0.277	0.520	0.559	0.565
X1.4	0.761	0.241	0.521	0.541	0.540
X2.1	0.294	0.730	0.438	0.254	0.342
X2.2	0.275	0.884	0.491	0.449	0.425
X3.1	0.579	0.391	0.747	0.640	0.586
X3.2	0.368	0.448	0.761	0.536	0.474

X3.3	0.556	0.328	0.772	0.536	0.573
X3.4	0.407	0.513	0.757	0.529	0.560
X3.5	0.424	0.504	0.779	0.562	0.603
Y.1	0.614	0.195	0.495	0.721	0.568
Y.2	0.546	0.414	0.657	0.803	0.577
Y.3	0.541	0.355	0.523	0.786	0.665
Y.4	0.532	0.422	0.610	0.794	0.680
Z.1	0.581	0.497	0.664	0.739	0.865
Z.2	0.600	0.376	0.633	0.680	0.876
Z.3	0.522	0.306	0.541	0.583	0.760

Source: Data processed (2026)

Based on the cross loading results in table 2, all indicators have the highest loading value on the construct they measure compared to other constructs. This indicates that each indicator is able to distinguish its variable well, so that discriminant validity has been fulfilled. Thus, the indicators on the Gamification Strategy, MALL, Microlearning Content, Learning Motivation, and Vocabulary Mastery variables are declared valid and feasible to be used in further analysis.

Table 3. AVE Values

Variable	Average Variance Extracted
Gamification Strategy (X1)	0.625
MALL (X2)	0.657
Microlearning content (X3)	0.583
Vocabulary Mastery (Y)	0.603
Learning Motivation (Z)	0.698

Source: Data processed (2026)

Looking at the Average Variance Extracted (AVE) scores, every variable in this study satisfies the convergent validity requirements. All values exceed the necessary minimum limit. This outcome shows that each construct can adequately represent its corresponding indicators. Therefore, the measurement model is considered valid and ready for additional analysis.

Table 4. Reliability Test Results

Variable	Composite Reliability
Gamification Strategy (X1)	0.870
MALL (X2)	0.792
Microlearning content (X3)	0.875
Vocabulary Mastery (Y)	0.858
Learning Motivation (Z)	0.873

Source: Data processed (2026)

Based on the composite reliability test results, all variables in this study show values above the required minimum threshold and are therefore declared reliable. This means that each construct has good internal consistency in measuring its indicators. Thus, all variables in this research model are trustworthy and suitable for further analysis.

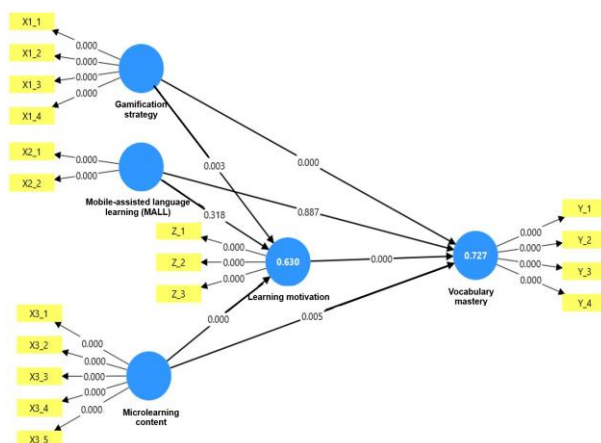


Figure 1. Bootstrapping Analysis (Source: Data processed, 2026)

Based on the bootstrapping results in figure 1, all relationships between variables show a p-value < 0.05, so that the proposed hypotheses can be accepted. The variables Gamification Strategy, MALL, and Microlearning Content have a significant effect on both Learning Motivation and Vocabulary Mastery. In addition, Learning Motivation also has a significant effect on Vocabulary Mastery, which indicates that learning motivation acts as a mediating variable in increasing vocabulary mastery. The R-square value of 0.630 on Learning Motivation and 0.727 on Vocabulary Mastery indicates that the model has a strong explanatory ability.

Table 5. R-square Results

Variable	R-Square	R-square adjusted
Learning Motivation (Z)	0.630	0.620
Vocabulary Mastery (Y)	0.727	0.717

Source: Data processed (2026)

Based on the R-square value, the Learning Motivation (Z) variable has a value of 0.630, which indicates that 63.0% of the variation in Learning Motivation can be explained by the variables in the model. Meanwhile, Vocabulary Mastery (Y) has a value of 0.727, which means that 72.7% of the variation in Vocabulary Mastery can be explained by the model. Overall, these two values indicate that the model has a strong explanatory ability.

Table 6. F- Square Results

Variable	Learning Motivation (Z)	Vocabulary Mastery (Y)
Gamification Strategy (X1)	0.129	0.226
MALL (X2)	0.000	0.014
Microlearning content (X3)	0.084	0.270
Learning Motivation (Z)	0.258	-

Source: Data processed (2026)

Based on the F-Square (effect size) results, the effect of Gamification Strategy (X1) and Microlearning Content (X3) on Vocabulary Mastery (Y) falls into the small to medium category, with the contribution of Microlearning Content being the most dominant. The effect of Learning Motivation (Z) on Vocabulary Mastery is in the medium category, indicating a fairly important role in increasing vocabulary mastery. Meanwhile, MALL (X2) has a very small to negligible effect on both variables, namely Learning Motivation and Vocabulary Mastery. Overall, the largest contribution in the model comes from Microlearning Content and Learning Motivation.

Table 7. Hypothesis Testing Output Results

Hypothesis	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Gamification Strategy -> Vocabulary Mastery	0.424	0.405	0.102	4.139	0.000
MALL -> Vocabulary Mastery	0.048	0.059	0.080	0.596	0.551
Microlearning content -> Vocabulary Mastery	0.449	0.451	0.090	4.994	0.000
Learning Motivation -> Vocabulary Mastery	0.436	0.434	0.077	5.674	0.000
Gamification Strategy -> Learning Motivation	0.367	0.344	0.123	2.994	0.003
MALL -> Learning Motivation	0.088	0.103	0.088	0.998	0.318
Microlearning content -> Learning Motivation	0.460	0.461	0.101	4.569	0.000
Gamification Strategy -> Learning Motivation -> Vocabulary Mastery	0.160	0.149	0.058	2.767	0.006
MALL -> Learning Motivation -> Vocabulary Mastery	0.038	0.044	0.039	0.984	0.325
Microlearning content-> Learning Motivation -> Vocabulary Mastery	0.200	0.201	0.061	3.314	0.001

Source: Data processed (2026)

The hypothesis testing outcomes reveal that Gamification Strategy has a considerable impact on Vocabulary Mastery (coefficient = 0.424, t statistic = 4.139, $p = 0.000$). MALL, however, fails to show a significant impact because its coefficient is merely 0.048, accompanied by a t statistic of 0.596 and a p value of 0.551. A positive and significant effect on Vocabulary Mastery emerges from Microlearning Content (coefficient = 0.449, t statistic = 4.994, $p = 0.000$). Additionally, Learning Motivation significantly affects Vocabulary Mastery (coefficient = 0.436, t statistic = 5.674, $p = 0.000$).

Gamification Strategy significantly affects Learning Motivation, according to the results, with values of 0.367 for the coefficient, 2.994 for the t statistic, and 0.003 for the p value. By contrast, MALL does not reach significance, shown by a coefficient of 0.088, a t statistic of 0.998, and a p value of 0.318. Microlearning Content again has a notable impact on Learning Motivation, reflected in a coefficient of 0.460, a t statistic of 4.569, and a p value of 0.000.

The results for the indirect pathways reveal a significant mediating role of Learning Motivation in the relationship between Gamification Strategy and Vocabulary Mastery (coefficient = 0.160, $t = 2.767$, $p = 0.006$). A significant indirect effect is also present for Microlearning Content via Learning Motivation (coefficient = 0.200, $t = 3.314$, $p = 0.001$). However, the mediation path involving MALL fails to show significance, with a t statistic of 0.984 and a p value greater than 0.05.

DISCUSSION

The Effect of Gamification Strategy on Vocabulary Mastery

The research results indicate that Gamification Strategy has a positive and significant effect on Vocabulary Mastery (beta = 0.424; $p = 0.000$). This finding indicates that the application of gamification strategies is capable of improving students' vocabulary mastery through enhanced learning engagement and active participation during the learning process. Gamification elements such as rewards, challenges, leaderboards, point systems, and instant feedback create a more engaging learning experience, thus motivating students to repeatedly practice vocabulary (Churiyah et al., 2024). This condition strengthens the process of vocabulary encoding and retention, which ultimately improves student learning outcomes.

This finding is consistent with previous research showing that gamification-based learning is capable of improving vocabulary learning outcomes because it creates a more interactive and enjoyable learning experience. Research by Yu (2023) shows that learners who study using a gamification approach have higher motivation, engagement, and satisfaction compared to conventional learning, which impacts the improvement of vocabulary mastery. Furthermore, the use of digital game-based media such as Wordwall and educational games has been proven to increase learning participation and expand vocabulary exposure frequency during the learning process (Mayaputri & Ekhsan, 2025). Thus, Gamification Strategy not only functions as a supporting learning medium, but also as a pedagogical approach that strengthens the vocabulary acquisition process.

The positive effect of gamification on Vocabulary Mastery can be explained through the increase in students' cognitive engagement during the learning process. The higher the students' engagement in game-based learning activities, the greater the opportunity for vocabulary repetition that contributes to long-term memory retention (Pasaribu et al., 2024; Rojabi et al., 2022). Furthermore, the mechanism of immediate feedback allows students to promptly correct errors in vocabulary use, making the learning process more adaptive. Therefore, Gamification Strategy can be regarded as an effective learning strategy for improving Vocabulary Mastery because it is capable of creating a more engaging, participatory, and student engagement-oriented learning environment (Fitriani et al., 2025).

The Effect of MALL on Vocabulary Mastery

The results show an insignificant effect of MALL on Vocabulary Mastery, with a beta value of 0.048 and a p value of 0.551. This finding implies that using mobile technology in language instruction has not directly improved students' vocabulary acquisition. Although mobile devices offer high learning access flexibility, the mere presence of technology is insufficient to produce improvement in learning outcomes if not accompanied by appropriate learning strategies. This condition shows that the effectiveness of MALL is not only determined by the use of technology, but also by how that technology is integrated into meaningful learning activities.

Previous research supports this finding by demonstrating that the success of MALL largely depends on learning design, usage intensity, and the extent to which students remain engaged while learning. Research by Ozer and Kılıç (2018) shows that Mobile-Assisted Language Learning can improve language learning outcomes if supported by interactive activities and high engagement. However, Febriyanti et al. (2021) show that the impact of MALL on language achievement varies because it is influenced by the implementation context, type of application, and learner characteristics. Furthermore, research by Sari and Kurniawan (2023) explains that the use of mobile applications that are only oriented toward accessing material tends to produce limited vocabulary improvement because students are less engaged in actively practicing language use.

The non-significant effect can also be explained through the pattern of technology use by students, which is likely more oriented toward content consumption rather than active language practice. Pong et al. (2025) explain that a high frequency of mobile device use is not always accompanied by a high quality of learning activities, thus limiting its contribution to vocabulary acquisition. This condition causes students to receive relatively low vocabulary exposure because the processes of repetition, retrieval practice, and contextual vocabulary use do not proceed optimally. Therefore, the results of this study indicate that the implementation of MALL requires a more interactive, collaborative, and structured learning design to make a greater contribution to Vocabulary Mastery.

The Effect of Microlearning Content on Vocabulary Mastery

According to the results, Microlearning Content has a significant positive effect on Vocabulary Mastery, with a beta value of 0.449 and a p value of 0.000. This finding implies that breaking down content into compact, clear, and focused units successfully improves students' vocabulary acquisition. Microlearning enables students to receive vocabulary exposure gradually, making the learning process easier to understand and not causing excessive cognitive load. This condition increases the opportunity for material repetition that contributes to improved vocabulary retention and recall.

This finding is consistent with previous research showing that microlearning is capable of improving the effectiveness of language learning through the presentation of concise and easily accessible material. Research by Okumuş Dağdelen (2023) explains that digital-based vocabulary learning with short duration and repeated exposure

has a positive contribution to vocabulary retention because learners can more easily perform repeated exposure to new vocabulary. Furthermore, research on microlearning in digital learning shows that micro-content-based learning increases engagement and learning persistence because learners can study flexibly according to their needs and learning time (Shail, 2019). Thus, Microlearning Content provides pedagogical advantages through the simplification of material without reducing learning effectiveness.

The positive effect of Microlearning Content on Vocabulary Mastery can be explained through the characteristics of learning that support the processes of retrieval practice and spaced repetition. The more frequently students receive vocabulary exposure in short learning sessions, the greater the opportunity for information to be stored in long-term memory. Febriyanti et al. (2021) explain that technology-based learning that provides quick and flexible access increases the frequency of student interaction with learning materials, thereby strengthening the language acquisition process. Therefore, the results of this study indicate that Microlearning Content can be regarded as an effective learning strategy because it is capable of increasing learning intensity, reducing cognitive overload, and strengthening vocabulary mastery on a sustained basis.

The Effect of Learning Motivation on Vocabulary Mastery

According to the results, Learning Motivation significantly and positively affects Vocabulary Mastery, with a beta value of 0.436 and a p value of 0.000. This finding implies that higher levels of student learning motivation lead to greater proficiency in acquiring English vocabulary. Learning motivation encourages students to be more actively engaged in the learning process, increases vocabulary practice frequency, and expands their desire to independently explore material. This condition demonstrates that psychological factors make an important contribution to determining the success of vocabulary acquisition.

This finding is consistent with previous research explaining that motivation is one of the main predictors of language learning success because it affects the intensity of effort, persistence, and engagement of learners during the learning process. Research by Iwaniec and Khaled (2024) shows that learners with high motivation tend to have better language achievement because they demonstrate greater engagement in language learning activities. Furthermore, research on vocabulary learning shows that motivated learners more frequently engage in repeated exposure, self-regulated learning, and retrieval practice that contributes to improved vocabulary acquisition. Thus, learning motivation functions as an internal driver that strengthens the vocabulary learning process on a sustained basis.

The positive effect of Learning Motivation on Vocabulary Mastery can also be explained through the improvement in the quality and intensity of learning activities carried out by students. Students with high motivation tend to allocate more learning time, have better persistence, and are more active in seeking learning strategies suited to their needs. Iwaniec and Khaled (2024) explain that high motivation increases the willingness to engage in language learning activities, so learners receive broader language exposure. In line with this, research by Gumilar and Syihabudin (2023) shows that learning motivation significantly contributes to improved vocabulary mastery because students are motivated to practice vocabulary more consistently. Therefore, the results of this study affirm that Learning Motivation is an important factor that strengthens Vocabulary Mastery through increased engagement, learning consistency, and intensity of language practice.

The Effect of Gamification Strategy on Learning Motivation

According to the results, Gamification Strategy has a significant positive effect on Learning Motivation, with a beta value of 0.367 and a p value of 0.003. This finding implies that using game like features in learning activities effectively boosts learner motivation. Components such as rewards, badges, leaderboards, and challenges create a more competitive yet enjoyable learning atmosphere, thereby motivating students to be more actively engaged in the learning process. This condition demonstrates that gamification not only impacts learning outcomes, but also the psychological aspects of learners.

Previous research agrees with this finding, specifically that gamification has the ability to strengthen intrinsic and extrinsic motivation in language learning contexts. Zainudin and Zulkipli (2023) explain that elements of gamification lead to greater student engagement and more persistence in completing academic tasks. In a similar vein, Zhang et al. (2022) show that game like elements in language learning increase motivation because they create a more

interactive and challenge driven educational experience. Thus, Gamification Strategy plays an important role in building stronger and more sustained learning motivation.

The positive effect of gamification on Learning Motivation can be explained through the increase in students' emotional and cognitive engagement during the learning process. When students feel challenged and receive immediate feedback, they tend to be more motivated to continue learning activities. Research by Putra et al. (2024) also shows that the application of gamification in English language learning increases learning motivation because it creates a more engaging and non-monotonous learning experience. Therefore, Gamification Strategy can be regarded as an effective pedagogical approach in improving Learning Motivation through a combination of competition, interactivity, and reward elements.

The Effect of MALL on Learning Motivation

According to the results, MALL has an insignificant effect on Learning Motivation, with a beta value of 0.088 and a p value of 0.318. This finding implies that mobile technology use in language instruction has failed to reliably enhance learner motivation. Although MALL provides flexibility in accessing material anytime and anywhere, this is not sufficient to build strong psychological engagement in the learning process. This condition shows that the presence of technology does not always directly correspond to an increase in motivation if not accompanied by interactive and directed learning design.

Dong et al. (2022), Raharjo et al. (2024), as well as Saputra and Farman (2025) explain that mobile learning can increase motivation if supported by interactive activities, clear feedback, and active learner engagement during the learning process. Meanwhile, Lei et al. (2022) through a meta-analysis study, show that the effect of MALL on language learning motivation is inconsistent because it is influenced by the context of use, type of application, and the level of student learning independence. Stockwell (2021) affirms that the use of mobile devices that only function as a medium for accessing material is not sufficient to significantly improve motivation because it does not provide a meaningful and challenging learning experience. These findings reinforce the fact that the effectiveness of MALL is highly dependent on the quality of its pedagogical implementation.

The non-significant effect can also be explained through the tendency of students to use mobile devices more as a means of content consumption rather than active learning activities. The lack of interaction, minimal learning challenges, and the absence of a structured reward system cause learning motivation to not develop optimally. Viberg et al. (2021) emphasize that MALL will be more effective in increasing motivation if combined with task-based learning and collaborative activities that encourage active participation. Therefore, the results of this study affirm that MALL does not automatically increase Learning Motivation, but is highly dependent on how the technology is designed and implemented in the learning process.

The Effect of Microlearning Content on Learning Motivation

According to the results, Microlearning Content has a significant positive effect on Learning Motivation, with a beta value of 0.460 and a p value of 0.000. This finding implies that presenting content in a short, well structured, single concept focused manner successfully boosts learner motivation. Microlearning makes the learning process feel lighter, so students do not easily experience boredom or cognitive overload. This condition encourages the emergence of a sense of comfort in learning that contributes to the improvement of learning motivation.

This finding is consistent with research results showing that microlearning is capable of increasing learning engagement and motivation because material is presented in small, easy-to-understand, and repetitive forms. Labibah (2025) explains that the microlearning approach in English language learning is capable of increasing student engagement because concise materials make the learning process more flexible and do not burden learners. Furthermore, Rahayu (2025) found that microlearning based on digital media such as short videos is capable of increasing learning interest and motivation because it suits the characteristics of the digital generation who need fast and practical learning. In line with this, Budiyan and Sujarwo (2020) also show that interactive multimedia-based learning can increase learning motivation through a more engaging and non-monotonous learning experience.

The increase in learning motivation through microlearning can also be explained through the increased sense of control students have over their learning process. Material presented concisely allows students to complete learning

in a short time, thereby providing a faster sense of achievement. This condition increases self-efficacy and motivates students to continue the learning process independently. Therefore, Microlearning Content can be regarded as an effective learning strategy in improving Learning Motivation through the simplification of material, flexibility of learning, and the enhancement of a more adaptive learning experience.

The Effect of Gamification Strategy on Vocabulary Mastery with Learning Motivation as a Mediating Variable

The research results indicate that Gamification Strategy has a significant effect on Vocabulary Mastery with Learning Motivation as a mediating variable ($\beta = 0.160$; $p = 0.006$). This finding indicates that gamification not only directly improves vocabulary mastery, but also works through the improvement of student learning motivation. Elements such as rewards, challenges, leaderboards, and instant feedback create a more engaging learning experience, thus motivating students to be more actively engaged in vocabulary learning. This condition shows that learning motivation is an important mechanism that bridges the effect of gamification on Vocabulary Mastery.

According to previous research, gamification boosts learning motivation, and this finding agrees with those studies. The reason is that gamification delivers an experience that is interactive, competitive, and focused on accomplishments. Nenden et al. (2024) explain that the use of gamification in English language learning can increase student learning motivation because the reward and challenge system makes the learning process more enjoyable. Furthermore, Purba et al. (2024) and Syahidallah et al. (2025) found that digital media-based gamification is capable of increasing student engagement in vocabulary learning because the presence of game elements encourages active participation. In line with this, Amanda (2025), Andewi et al. (2025) as well as Safitri and Tari (2024) also show that gamified learning increases learning motivation, which subsequently impacts the improvement of English language learning outcomes.

The improvement in Vocabulary Mastery through gamification occurs because higher learning motivation encourages students to practice vocabulary more frequently and participate in learning activities. When students have strong motivation, they tend to be more consistent in reviewing material, completing challenges, and actively engaging in game-based learning activities. This condition strengthens the long-term internalization of vocabulary. Therefore, Learning Motivation is proven to serve as a mediating variable that strengthens the relationship between Gamification Strategy and Vocabulary Mastery.

The Effect of MALL on Vocabulary Mastery with Learning Motivation as a Mediating Variable

The results show an insignificant effect of MALL on Vocabulary Mastery through Learning Motivation as a mediating variable ($\beta = 0.038$; $p = 0.325$). This finding implies that the current use of mobile technology in language learning fails to adequately boost learning motivation. As a result, there is no meaningful indirect contribution to vocabulary mastery. Although MALL provides easy access to material at any time, this is not sufficient to create deep learning engagement. This condition shows that learning motivation is not formed strongly, thus the mediation path becomes non-significant.

This finding is consistent with research results showing that the effectiveness of MALL is highly dependent on the learning design and level of interaction that occurs during the learning process. Yundayani et al. (2019) explain that the use of mobile learning in English language learning does not necessarily improve learning outcomes if it is only used as a medium for accessing material without interactive learning activities. Furthermore, Losi (2022), Nuraeni et al. (2020), Sakkiir and Syamsuddin (2023) as well as Van and Thanh (2021) found that the use of mobile applications for vocabulary learning tends to yield limited results when students are not actively engaged in vocabulary practice. In line with this, Etfita et al. (2025) and Sayuti et al. (2025) also show that MALL requires a structured learning design to be able to effectively improve English language learning motivation and outcomes.

The non-significant indirect effect through Learning Motivation can be explained through the low engagement of students in mobile-based learning activities. Students tend to use mobile devices to passively read or access material without conducting intensive vocabulary practice. This condition causes learning motivation to not develop optimally, thus failing to strengthen vocabulary mastery. Therefore, Learning Motivation does not function as an effective mediator in the relationship between MALL and Vocabulary Mastery.

The Effect of Microlearning Content on Vocabulary Mastery with Learning Motivation as a Mediating Variable

The research results indicate that Microlearning Content has a significant effect on Vocabulary Mastery with Learning Motivation as a mediating variable ($\beta = 0.200$; $p = 0.001$). This finding indicates that the presentation of material in a concise, focused, and structured form not only directly improves vocabulary mastery, but also through the improvement of student learning motivation. Microlearning makes the learning process feel lighter, so students can more easily understand and repeatedly review vocabulary material step by step. This condition strengthens learning engagement which subsequently impacts the improvement of motivation and learning outcomes.

This finding is consistent with research results showing that microlearning is capable of improving motivation and learning outcomes because it provides a more flexible and cognitively less burdensome learning experience. Labibah (2025) explains that digital-based microlearning is capable of increasing student engagement because concisely presented material is easier to understand and repeat. Furthermore, Rahayu and Supartini (2025) found that the use of microlearning based on digital media increases learning interest because it suits the characteristics of learners who need fast, concise, and easily accessible learning. In line with this, Budiyan and Sujarwo (2019) also show that interactive multimedia-based learning can increase learning motivation which subsequently impacts the improvement of language learning outcomes.

The improvement in Vocabulary Mastery through microlearning occurs because higher learning motivation encourages students to more frequently review vocabulary and study independently. When students have good motivation, they tend to be more consistent in accessing material, reviewing vocabulary, and completing learning activities on a sustained basis. This condition strengthens the long-term vocabulary retention process through structured repeated exposure. Therefore, Learning Motivation is proven to serve as a mediating variable that strengthens the relationship between Microlearning Content and Vocabulary Mastery.

CONCLUSION

To conclude, Gamification Strategy and Microlearning Content have a direct positive and significant impact on Vocabulary Mastery. They also exert an indirect positive effect through Learning Motivation as a mediating variable. These findings imply that integrating gamification components including rewards, leaderboards, and challenges together with concise and systematically arranged content can raise student learning engagement. Higher engagement ultimately strengthens learners' command of English vocabulary. Furthermore, Learning Motivation proved to have a significant effect on Vocabulary Mastery, affirming that learning motivation is an important psychological factor in supporting the success of digital technology-based vocabulary learning. In contrast, Mobile-Assisted Language Learning (MALL) showed no significant effect on either Vocabulary Mastery or Learning Motivation, indicating that the use of mobile technology alone is not yet sufficiently effective without being supported by interactive and directed learning design.

This study carries important implications for vocabulary instruction in the digital era. Educators need to integrate gamification, microlearning, and motivation enhancing strategies into their teaching. For example, lecturers can design weekly vocabulary tasks in the form of point-based challenges using mobile quiz applications, provide immediate feedback through automated quizzes, and structure microlearning content into daily 5–10 minute learning units to encourage consistent practice. The results strengthen the theoretical view that technology based learning works well only when digital media are accompanied by strong pedagogical design (Irfandi et al., 2024). Such design should foster engagement, flexibility, and a strong orientation toward active student involvement. Practically, English language lecturers and learning developers can utilize gamification and microlearning-based platforms to improve student motivation and vocabulary practice intensity on a sustained basis. Further, this study also contributes to the development of a gamified microlearning ecosystem model in the context of mobile-based English language learning.

Based on the research results, it is recommended that educational institutions and educators develop vocabulary learning that more systematically integrates gamification elements and microlearning within the MALL environment. The use of mobile applications should not only function as a medium for accessing material, but should also be

designed with interactive activities, instant feedback, learning challenges, and vocabulary exercises that encourage active student participation. Future research is advised to expand the sample size and involve different educational levels so that the research results have a higher level of generalizability. Furthermore, future research can add other variables such as self-regulated learning, digital engagement, or learning satisfaction to obtain a more comprehensive understanding of the effectiveness of digital technology-based language learning.

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