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Correlation Between Mobile Legends Playing Intensity and Vocabulary Development Among Senior High School Students

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ABSTRACT

This study investigates the correlation between the intensity of playing *Mobile Legends* and vocabulary development among senior high school students. The growing adoption of digital games for educational purposes—particularly in language learning—necessitates research into their integration within structured learning environments. Utilizing a quantitative correlational design, the study involved 25 purposively selected students from SMA Labschool Untad Palu who actively participated in a *Mobile Legends* extracurricular program. Data were collected through a 15-item Likert-scale questionnaire measuring gameplay intensity and a 30-item vocabulary test targeting common nouns, verbs, and adjectives derived from gameplay contexts. The questionnaire demonstrated strong internal consistency (Cronbach's Alpha = 0.882), and all items were deemed valid. Results from the Pearson Product-Moment correlation analysis indicated a moderate, statistically significant relationship between gameplay intensity and vocabulary acquisition ($r = 0.538$, $p = 0.005$). These findings suggest that structured digital gameplay in English-language environments can support incidental vocabulary learning and serve as an effective pedagogical supplement to conventional instruction.

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1. INTRODUCTION

The growing integration of technology into educational environments has led to increasing interest in the potential of digital games for language learning. Among these games, Mobile Legends: Bang Bang stands out due to its widespread popularity and immersive gameplay, which exposes players to a variety of English terms and expressions. This phenomenon reflects a broader trend in which entertainment platforms are increasingly being explored for their pedagogical potential. As the game becomes a cultural phenomenon, especially among high school students, educators and researchers have begun to explore its

potential beyond entertainment. Understanding how these games contribute to language exposure is essential in designing learning environments that are both engaging and effective.

Mobile Legends: Bang Bang, a multiplayer online battle arena (MOBA) game, has become widely popular among Indonesian adolescents, with over 35 million downloads globally [1]. This popularity has led some schools to incorporate the game into extracurricular activities [2]. Despite concerns regarding excessive gameplay, recent studies have explored its educational benefits, especially in English language acquisition. For instance, Aulia et al. [3] found that playing Mobile Legends enhances learners' vocabulary through repetitive in-game interactions. Similarly, Saputra el atl. [4] and Asmiyah et al. [5] emphasized that gameplay offers contextual and visual exposure to new words. Khasanah [6] and Qiao et al. [7] highlighted the role of interactive and immersive experiences in internalizing vocabulary. Waluyo and Tran [8] added that such games increase learner motivation and satisfaction. These findings suggest that digital games can serve not merely as recreational tools but as facilitators of incidental and contextual learning.

However, most existing studies focus on informal learning contexts. This study addresses that gap by examining vocabulary development in a structured school setting. Unlike Edombingo et al. [9], who focused on university learners in informal settings, this study offers insight into the effects of Mobile Legends when implemented as a school-based extracurricular activity. By doing so, it provides a unique contribution to the growing body of research on game-based learning within formal educational institutions. Incorporating structured gameplay into formal settings allows researchers to isolate better and analyze the academic impacts of such digital platforms, particularly in adolescent learners who are highly immersed in gaming culture.

The objectives of this study are to explore whether there is a statistically significant correlation between Mobile Legends playing intensity and vocabulary acquisition and to analyze how structured exposure to English during gameplay can support language learning outcomes. By analyzing this relationship, the study seeks to support the integration of digital games in formal education as an engaging and effective supplementary learning tool. Such integration aligns with 21st-century learning paradigms that emphasize technology-enhanced learning, student engagement, and learner autonomy.

In the digital era, language learning has been significantly influenced by mobile applications and online games. Mobile Legends: Bang Bang, a multiplayer online battle arena (MOBA) game, has become widely popular among Indonesian adolescents, with over 35 million downloads globally [10]. This popularity has led some schools to incorporate the game into extracurricular activities [11]. This shift marks a progressive approach in utilizing students’ existing interests to reinforce academic learning, particularly in vocabulary acquisition, which is crucial for language proficiency.

Despite concerns regarding excessive gameplay, recent studies have explored its educational benefits, especially in English language acquisition. For instance, [2] found that playing Mobile Legends enhances learners' vocabulary through repetitive in-game interactions. Similarly, Camelia [12] and Qothrunnada et al. [13] emphasized that gameplay offers contextual and visual exposure to new words. Gunel and Top [14] and Kurniawan and Rahmawati [15] highlighted the role of interactive and immersive experiences in internalizing

vocabulary. Wahyuni et al. [16] added that such games increase learner motivation and satisfaction. As supported by this body of literature, the potential for mobile gaming to serve as a vocabulary-building platform is increasingly being recognized in educational discourse [17].

However, most existing studies focus on informal learning contexts. This study addresses that gap by examining vocabulary development in a structured school setting. Unlike Sani et al. [18], who focused on university learners in informal settings, this study offers insight into the effects of Mobile Legends when implemented as a school-based extracurricular activity. By grounding the study in a formal academic context, the research explores the extent to which structured game-based exposure can contribute to measurable educational outcomes.

The objectives of this study are to explore whether there is a statistically significant correlation between Mobile Legends playing intensity and vocabulary acquisition and to analyze how structured exposure to English during gameplay can support language learning outcomes. By analyzing this relationship, the study seeks to support the integration of digital games in formal education. Findings from this study are expected to inform curriculum developers, educators, and policymakers regarding the pedagogical integration of digital games into language learning frameworks.

2. METHOD

This study utilized a quantitative correlational approach [19]. Participants were 25 purposively selected students from SMA Labschool Untad Palu who consistently participated in the Mobile Legends extracurricular program. Purposive sampling was employed to ensure the selection of students with consistent exposure to game-based language contexts, thereby enhancing the internal validity of the study. The choice of this method aligns with the study's objective to measure the relationship between game-playing intensity and vocabulary acquisition in a controlled, school-based setting.

Two research instruments were used: (1) a 15-item Likert-scale questionnaire and (2) a vocabulary test consisting of 30 multiple-choice items. The questionnaire was designed to assess gameplay frequency, duration, and engagement. Items were constructed based on theoretical frameworks of game-based learning and validated through expert judgment by two English education lecturers. A pilot study involving 10 students was conducted to test reliability and validity, resulting in all items being valid ($r > 0.396$) and a high Cronbach's Alpha value of 0.882, indicating strong internal consistency.

The vocabulary test was designed to evaluate students' understanding of common nouns, action verbs, and descriptive adjectives frequently encountered during Mobile Legends gameplay. Items were developed from authentic in-game contexts and validated by expert review. Sample items include:

- *Common noun*:
  1. Each hero in Mobile Legends has a different _____ that determines their role in the game.
     A) ability B) strategy C) role D) task → Correct: C

2. Before playing a ranked match, players check their _____ to review their performance.
   A) mission B) statistics C) results D) items → Correct: B

- *Action verb*:
  1. Players must _____ their skills by practicing frequently.
     A) ignore B) forget C) decrease D) improve → Correct: D
  2. Before taking an exam, students need to _____ their notes carefully.
     A) Check B) erase C) replace D) delay → Correct: A
- *Descriptive adjective*:
  1. A tank hero is usually very _____ and can take much damage.
     A) small B) strong C) weak D) slow → Correct: B
  2. Some heroes have _____ abilities that allow them to attack enemies faster.
     A) unnecessary B) useless C) powerful) boring → Correct: C

All vocabulary items were tailored to match the participants' proficiency level and reflect actual language exposure from the gameplay. The blueprint and categorization of items—consisting of 10 nouns, 10 verbs, and 10 adjectives—ensured balanced coverage of key vocabulary domains, and are detailed further in the Results section.

Prior to analysis, data normality was assessed using the Kolmogorov-Smirnov test. Both the gameplay intensity scores and vocabulary test results showed significance values greater than 0.05, indicating that the assumption of normal distribution was met. This allowed the use of the Pearson Product-Moment correlation test to examine the statistical relationship between the two variables. All statistical analyses were performed using SPSS.

3. RESULTS AND DISCUSSION

This section presents the findings of the research, which aims to identify the correlation between the intensity of playing Mobile Legends and students' vocabulary development. The data analysis involved several types: validity test, reliability test (only for the questionnaire), normality test, and Pearson Product-Moment Correlation test. The results are described below:

3.1. Validity Test

Validity testing was conducted using Pearson's r product-moment correlation. For the questionnaire instrument, all 15 items showed r-count values greater than the critical r-table value of 0.396 (df = 23), indicating that all items were valid. The results are presented in the following table:

Table 1. Validity Test of the Questionnaire

Variable	No Item	Rcount	r table (df=23; α=5%)	Criteria
Intensity of Playing Mobile Legends	1	0.789	0.396	Valid
	2	0.745		Valid
	3	0.465		Valid
	4	0.669		Valid
	5	0.711		Valid
	6	0.735		Valid
	7	0.632		Valid
	8	0.502		Valid
	9	0.409		Valid
	10	0.540		Valid
	11	0.560		Valid
	12	0.461		Valid
	13	0.496		Valid
	14	0.791		Valid
	15	0.739		Valid

3.2. Reliability Test

Reliability was assessed using Cronbach's Alpha. The result for the questionnaire was 0.882, signifying high internal consistency. The result is shown below:

Table 2. Reliability Test Result

Variable	Cronbach's Alpha Value	Critical Point	Information
Intensity of playing Mobile Legends	0.882	0.60	Reliable

The Cronbach's Alpha value exceeds 0.60, which means that the questionnaire is reliable and consistently measures the intended construct.

3.3 Vocabulary Test Blueprint

The vocabulary test consisted of 30 items, structured as follows:

Table3. Vocabulary Test Item

Category	Number
Common Noun	10
Action Verb	10
Descriptive Adjective	10
Total	**30**

Items were developed with reference to vocabulary frequently encountered during Mobile Legends gameplay, such as terms related to characters, actions (e.g., attack, defend), and qualities (e.g., strong, fast) [20]. The blueprint ensured a balanced representation of essential academic vocabulary classes.

3.4 Normality Test

The Kolmogorov-Smirnov test produced significance values above 0.05 for both variables (playing intensity and vocabulary test scores), confirming that the data were normally distributed.

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		25
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	5.36393255
Most Extreme Differences	Absolute	.084
	Positive	.084
	Negative	-.080
Test Statistic		.084
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Figure 1. SPSS Output of Normality Test

The significance values for both variables were above 0.05, indicating that the data are normally distributed and suitable for Pearson correlation analysis [21].

3.5 Pearson Correlation Test

The Pearson Product-Moment correlation test yielded an r-value of 0.538 with a significance value of 0.005. This result indicates a moderate and statistically significant positive correlation between the intensity of playing Mobile Legends and vocabulary development across the three targeted vocabulary types. The result is presented below:

Correlations

		Intensity of playing Mobile Legends	Students vocabulary development
Intensity of playing Mobile Legends	Pearson Correlation	1	.538**
	Sig. (2-tailed)		.005
	N	25	25
Students vocabulary development	Pearson Correlation	.538**	1
	Sig. (2-tailed)	.005	
	N	25	25

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

Figure 2. SPSS Output of Pearson Correlation Test

The Pearson Product-Moment correlation test yielded an r-value of 0.538 with a significance value of 0.005. Since the p-value is below 0.05, this indicates a statistically significant correlation. The r-value of 0.538 suggests a moderate positive correlation between the intensity of playing Mobile Legends and students' vocabulary development [22].

DISCUSSION

The results confirm a moderate, significant correlation between gameplay intensity and vocabulary acquisition. This supports studies such as Waluyo et al. [8] and Cancino and Viguera [23], which suggest that gamified environments enhance learning through repetition and engagement. The finding reinforces the view that digital games, when integrated thoughtfully into learning settings, can stimulate vocabulary growth by exposing learners to frequent, contextualized input.

In contrast with Munir and Zaheer [24], whose study focused on informal learning, this study was conducted in a structured school setting, suggesting that institutionalized extracurricular activities provide stronger learning outcomes. This aligns with findings by Thurairasu [25] that gamified contexts boost vocabulary development through meaningful interaction. Such institutionalization may enhance learner accountability and provide more consistent exposure to educational stimuli, which in turn facilitates deeper processing of new lexical items.

Al-karawi [26] argues that English exposure through structured gaming fosters retention, while Sayd and Nazarudin [27] find that regular gameplay improves students' language mastery. Similarly, Fujimoto and Yap [28] underscore the role of incidental learning in mobile games, which is echoed by Shang and Geng [29]. These mechanisms are likely activated when students are immersed in dynamic, linguistically rich gaming environments, where comprehension is necessary for task completion and success.

Moreover, Yu [30] found that integrating gaming elements into instruction increases satisfaction and vocabulary outcomes. This research reaffirms that digital gameplay when embedded in formal learning, can be an effective language acquisition strategy. The motivational element of games—particularly the immediate feedback and reward systems—may encourage learners to engage more frequently and willingly with English vocabulary compared to conventional methods.

The moderate correlation coefficient (r = 0.538) suggests that while gameplay intensity contributes to vocabulary development, it is not the sole determinant. Other factors, such as prior language proficiency, motivation, learning styles, and exposure to English outside of gameplay, may also play a significant role. Future studies could explore how these variables interact with game-based learning to produce more nuanced insights.

Interestingly, the results also validate the design of the vocabulary test, which focused on common nouns, verbs, and adjectives extracted from gameplay content. The balanced composition of the test and its relevance to students' actual gaming experience may have increased the sensitivity of the instrument in capturing true vocabulary gains. This emphasizes the importance of content alignment between learning tools and assessment instruments in educational research.

In educational practice, these findings justify incorporating digital games like Mobile Legends into language learning programs—not merely as passive entertainment but as structured pedagogical tools. Teachers and curriculum designers can consider integrating game-based modules that align with language objectives, ensuring that gameplay serves both motivational and instructional purposes within formal learning ecosystems.

4. CONCLUSION

This study reveals that the intensity of Mobile Legends gameplay has a moderate and statistically significant correlation with vocabulary development among senior high school students. The empirical evidence (r = 0.538, p = 0.005) suggests that greater involvement in English-mediated gameplay environments contributes to enhanced lexical acquisition. Structured exposure to English within gaming contexts supports incidental vocabulary learning by embedding language within meaningful, engaging interactions. Educators may consider digital games as complementary tools to enhance student motivation and language acquisition. The integration of such tools—especially when embedded in formal extracurricular programs—offers learners opportunities to acquire new vocabulary in dynamic, contextualized, and interactive ways.

In addition to reinforcing existing knowledge on game-based learning, this study contributes new insights specific to the Indonesian high school context. By focusing on a structured educational setting rather than informal learning, the study provides valuable implications for schools seeking to incorporate digital games as part of their language learning strategies. It highlights the pedagogical value of using game-based exposure to English in supporting vocabulary development beyond traditional classroom methods, particularly through activities that align with students' interests.

Future research may expand this investigation by employing a larger and more diverse sample to enhance generalizability. A longitudinal approach could provide deeper insights into how sustained gameplay affects vocabulary retention over time. Comparative studies across different types of educational games or genres—such as simulation, role-playing, or puzzle games—could also yield important findings regarding the effectiveness of various game mechanics in language learning. Furthermore, integrating qualitative methods such as interviews or classroom observations may enrich the understanding of learner engagement and the cognitive processes involved during gameplay.

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