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The Effect Of Roblox Application On 7th-Grade Students' Vocabulary Mastery

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Abstract

This study investigates the effect of the Roblox application on the English vocabulary mastery of seventh-grade students at SMP Negeri 37 Medan. The research was motivated by students' limited vocabulary acquisition, which often hampers their communication skills, as well as the lack of digital integration in conventional teaching methods. A quantitative method with a true experimental design was employed, involving two classes as samples: class 7-A (31 students) as the experimental group taught using the Roblox application and class 7-B (31 students) as the control group taught conventionally. The research instruments consisted of vocabulary tests including multiple-choice, word-matching, and fill-in-the-blank tasks, administered as pre-tests and post-tests. The findings revealed that the experimental group achieved a higher mean score improvement, increasing from 64.84 to 78.55, compared to the control group, which only improved from 63.38 to 71.61. Statistical analysis using an independent t-test (t-value 2.516 > t-table 2.000, a=0.05) confirmed a significant difference between the groups with a medium effect size (0.39). These results indicate that the Roblox application positively influences students' vocabulary mastery and can serve as an effective supplementary tool for English language teaching at the junior high school level.

Keywords: *Roblox, vocabulary, language learning, online games, educational media*

INTRODUCTION

Vocabulary is a vital element in mastering English as a foreign language. It functions as the foundation for the four essential language skills: listening, speaking, reading, and writing. Richards & Renandya (Ramanujam & Hanita, 2024) emphasized that learners' vocabulary knowledge significantly influences their overall language proficiency. Without sufficient vocabulary, students face barriers in understanding texts, expressing ideas, or participating in meaningful conversations (Tampubolon, Korin Hutagalung, Silitonga, & Tua Manullang, 2023). At SMP Negeri 37 Medan, preliminary observations reveal that many seventh-grade students struggle to engage in English communication due to limited vocabulary. This is reflected in their low performance on English tests, where the average score (58) falls below the school's minimum standard (KKM 75). Beside that, when the English teacher gave the assignments or asked the questions orally, several students in seventh grade at SMP seemed confused, responded slowly, passive and showed a lack of confidence in English class while they were communicating some topics and it made they

had a lack of enthusiasm. Such challenges are consistent with findings by Tampubolon et al. (Zhai, 2024) who assert that inadequate vocabulary mastery diminishes students' language capabilities and class participation.

Several internal and external factors contribute to these difficulties in learning English, including lack of motivation, insufficient learning resources, and ineffective teaching methods (Marini & Salas, 2023). According to Umar in the same study, a traditional teaching approach that relies heavily on textbooks often lacks the capacity to stimulate student engagement. These conventional strategies fail to integrate technology effectively, which is crucial in today's digital era (Faridah & Deng, 2024). Siswati & Istikomah (2022) similarly argue that the ineffective implementation of digital tools in classrooms contributes to low enthusiasm and limited understanding. To overcome these limitations, innovative instructional media are needed. As Puyada et al. (2018) explain, interactive media can transform abstract concepts into comprehensible and engaging learning experiences. Games, stories, and simulations if used appropriately can enhance both comprehension and motivation.

In this context, the Roblox application emerges as a potential solution. Roblox is an online game platform that allows students to interact, explore, and learn through immersive environments and simulations (Wibowo, Wardana, Kunci, & Pembelaja, 2022). It supports collaborative learning, communication, and creativity which are the key aspects of 21st-century education. According to Zhai (2024), Roblox fosters community-driven learning, giving students autonomy and purpose within virtual tasks. Previous studies have demonstrated its positive impact on vocabulary acquisition. For example, Faridah & Deng (2024) found that Roblox enhanced student motivation and learning engagement in higher education. Likewise, Wicaksono et al. (2024) reported that Roblox gameplay positively influenced vocabulary learning among high school students, despite minor issues in grammar clarity. Ramanujam & Hanita (Azzahra, Murjainah, & Suriadi, 2025) confirmed that Roblox offers immersive and contextualized learning that supports retention and communication, emphasizing the importance of real-time feedback in language acquisition.

Despite growing evidence of its educational benefits, there remains a lack of focused empirical studies on the effect of Roblox specifically on vocabulary mastery among junior high school students in Indonesia. Most prior research has centered on general student engagement or social interaction rather than structured vocabulary outcomes (Wiyuna, Muliyati, & Fahdiran, 2024). Therefore, this study aims to investigate *The Effect of Roblox Application on 7th-Grade Students' Vocabulary Mastery at SMP Negeri 37 Medan*. Using a true experimental design, the study compares the vocabulary achievement of students taught with Roblox against those taught using conventional methods. Grounded in Thornbury's (2002) vocabulary theory which focused particularly on "word classes" such as nouns, verbs, adjectives, and others. This research seeks to contribute both theoretical insights and practical recommendations for integrating game-based media in English instruction (Jeong, Lee, Byun, & Moon, 2024).

METHOD

This study employed a quantitative approach with a true experimental design to investigate the effect of the Roblox application on students' vocabulary mastery. This design was chosen to establish cause-effect relationships through control and experimental groups (Han, Liu, & Gao, 2023). The population consisted of all seventh-grade students of SMP Negeri 37 Medan, comprising six classes. As stated by Sugiyono (2013), purposive sampling is a technique where the selection of samples is based on particular considerations. Both classes demonstrated a similar level of vocabulary mastery, making them suitable for a balanced comparison. Furthermore, students in these classes consistently attended lessons, were familiar with the Roblox application, and had access to the necessary technology, which facilitated the implementation of the study. Through purposive sampling, two classes with similar vocabulary proficiency were selected: Class 7-A (31 students) as the experimental group and Class 7-B (31 students) as the control group. The experimental group received vocabulary instruction through the Roblox application, while the control group was taught using conventional methods.

The research procedure consisted of three stages: (1) administering a pre-test to both groups to assess initial vocabulary mastery, (2) providing treatment for the experimental group using the Roblox application while the control group continued with conventional method learning, and (3) administering a post-test to measure vocabulary improvement. The test instrument was developed based on Thornbury's (2002) vocabulary classification (nouns, verbs, adjectives, etc.) and consisted of multiple-choice, word-matching, and fill-in-the-blank items (Siswati & Istikomah, 2022).

Instrument validity was tested using Pearson Product-Moment Correlation which calculated through CORREL formula in Microsoft Excel, while reliability was measured with Cronbach's Alpha formula in Microsoft Excel to ensure consistency and accuracy of the instrument. Data were analyzed using the Independent Samples T-Test in SPSS to determine whether there were significant differences in the post-test scores between the experimental and control groups (Thornbury, 2000).

RESULTS, FINDINGS AND DISCUSSION

This research utilized an experimental method involving seventh-grade students at SMP Negeri 37 Medan which divided into two classes, 7-A and 7-B, were selected as the research samples. Class 7B was designated as the control group, while Class 7-A functioned as the experimental group (Richards & Renandya, 2002). The control group was taught using conventional methods, whereas the experimental group was instructed through the use of a game-based platform, specifically the Roblox Application (Rianti, 2017). To assess the students' vocabulary mastery, both groups were given a pre-test and a post-test. The outcomes of these tests are presented in the tables below (Bishry, 2018).

Tabel 1. The Data of Pre-Test and Post-Test of Experimental Group

No.	Students' Initial Name	Pre Test (X_1)	Post Test (X_2)	Difference Score ($dx=X_2-X_1$)	Square of Difference Score (d^2)
1	ALT	95	100	5	25
2	ARF	45	60	15	225
3	AF	25	35	10	100
4	AH	35	40	5	25
5	AHP	70	80	10	100
6	ADGS	95	100	5	25
7	CROS	75	90	15	225
8	DAS	80	80	0	0
9	DB	85	95	10	100
10	HAK	50	80	30	900
11	ISA	60	75	15	225
12	ILRS	80	85	5	25
13	JEOP	95	100	5	25
14	KA	80	85	5	25
15	MYM	85	95	10	100
16	MIRH	75	90	15	225
17	MVAR	20	60	40	1600
18	MFA	65	100	35	1225
19	MCBG	75	85	10	100
20	NJ	65	80	15	225
21	PVN	70	100	30	900
22	RP	75	75	0	0
23	RA	35	55	20	400
24	RAK	70	80	10	100
25	SLIP	90	95	5	25
26	SUS	80	90	10	100
27	SMAF	10	10	0	0
28	SA	70	95	25	625
29	WS	15	50	35	1225
30	YAS	80	95	15	225
31	ZA	60	75	15	225
	Total	**2010**	**2435**	**425**	**9325**
	Mean	**64.84**	**78.55**	**13.71**	**300.81**

Based on Table 1, the experimental group recorded a total pre-test score of 2010, resulting in an average of 64.84. After using the Roblox Application as a learning tool, their

total post-test score increased to 2435, with a mean of 78.55. This shows an improvement of 425 points between the pre-test and post-test, and the sum of squared differences (d^2) was 9325 (Sinaga, Parhusip, & Saragih, 2023). These results indicate a significant improvement in students' vocabulary proficiency following the intervention (Wicaksono, Anwar, & Asmara, 2024). The data for the control group is presented as follows:

Tabel 2. The Data of Pre-Test and Post-Test of Control Group

No.	Students' Initial Name	Pre Test (Y_1)	Post Test (Y_2)	Difference Score ($dy=Y_2-Y_1$)	Square of Difference Score (d^2)
1	AF	65	70	5	25
2	AHP	60	65	5	25
3	AP	55	65	10	100
4	AK	75	90	15	225
5	AR	60	70	10	100
6	AA	65	75	10	100
7	AS	75	80	5	25
8	ARA	70	75	5	25
9	ARE	40	60	20	400
10	ARM	40	65	25	625
11	ASA	80	85	5	25
12	AFA	65	70	5	25
13	BR	75	85	10	100
14	CA	65	70	5	25
15	DAZ	45	50	5	25
16	DAS	50	65	15	225
17	DH	40	50	10	100
18	DMTN	75	75	0	0
19	EV	75	80	5	25
20	FS	65	70	5	25
21	HG	70	70	0	0
22	JC	75	80	5	25
23	JBM	75	85	10	100
24	MAH	50	60	10	100
25	NDS	50	65	15	225
26	SNF	75	80	5	25
27	SZA	80	85	5	25
28	SG	60	65	5	25
29	VB	40	45	5	25
30	WJ	65	80	15	225
31	YR	85	90	5	25

Total	**1965**	**2220**	**255**	**3025**
Mean	**63.38**	**71.61**	**8.22**	**97.58**

Referring to Table , the control group achieved a total pre-test score of 1965, resulting in an average of 63.38. After undergoing conventional learning, their total post-test score rose to 2220, with a mean of 7161. The difference between the pre- and post-test scores (d) was 255, and the total of the squared differences (d^2) amounted to 3025. These findings suggest a notable improvement in students' vocabulary mastery through conventional learning, although the increase was less substantial compared to the group using the Roblox Application (Puyada, Ganefri, Ambiyar, Wulansari, & Hayadi, 2018). Based on the data from both experimental and control groups, the t-test formula calculation can be calculated as follows:

The Calculation of Mean of the T-Test

a. The Calculation of Experimental Group's Mean

The mean scores for the experimental group's pre-test and post-test are presented as follows:

$$Md_X = \frac{\Sigma d}{N} = \frac{425}{31} = 13.709 = 13.71$$

The sum of squared deviations of the experimental group is calculated as follows:

$$D_X^2 = (\Sigma d^2) - \frac{(\Sigma d)^2}{N_x}$$

$$D_X^2 = 9325 - \frac{(425)^2}{31}$$

$$D_X^2 = 9325 - \frac{180625}{31}$$

$$D_X^2 = 9325 - 5826.61$$

$$D_X^2 = 3498.39$$

Based on the calculation above, the experimental group has a mean of 13.71 and a sum of squared deviations of 3498.39.

b. The Calculation of Control Group's Mean

The mean scores for the control group's pre-test and post-test are as follows:

$$Md_y = \frac{\Sigma d}{N} = \frac{255}{31} = 8.225 = 8.22$$

The sum of squared deviations of the control group is calculated as follows:

$$D_y^2 = (\Sigma d^2) - \frac{(\Sigma d)^2}{Ny}$$

$$D_y^2 = 3025 - \frac{(255)^2}{31}$$

$$D_y^2 = 3025 - \frac{65025}{31}$$

$$D_y^2 = 3025 - 2097.58$$

$$D_y^2 = 927.42$$

From the above calculations, the control group has a mean of 8.22 and a sum of squared deviations of 927.42.

Based on these results, the researcher summarizes the data for both the experimental and control groups as follows:

Experimental Group:

1. Total Pre-test Score (X1) = 2010
2. Total Post-test Score (X2) = 2435
3. Total Difference (dx) = 425
4. Total Square of Difference (d^2) = 9325
5. Number of Students (Nx) = 31
6. Mean of Difference (Mdx) = 13.71
7. Variance Component (dx^2) = 300.81

Control Group:

1. Total Pre-test Score (Y1) = 1965
2. Total Post-test Score (Y2) = 2220
3. Total Difference (dy) = 255
4. Total Squared Difference (d^2) = 3025
5. Number of Students (Ny) = 31
6. Mean of Difference (Mdy) = 8.22
7. Variance Component (dy^2) = 927.42

Calculating the T-Test Scores

$$t = \frac{Mx - My}{\sqrt{\left[\frac{Dx^2 + Dy^2}{N_{x+Ny-2}}\right]\left[\frac{1}{Nx} + \frac{1}{Ny}\right]}}$$

$$t = \frac{13.71 - 8.22}{\sqrt{\left[\frac{3498.39 + 927.42}{31 + 31 - 2}\right]\left[\frac{1}{31} + \frac{1}{31}\right]}}$$

$$t = \frac{5.49}{\sqrt{\left[\frac{4425.81}{60}\right]\left[\frac{2}{31}\right]}}$$

$$t = \frac{5.49}{\sqrt{[73.7635][0.0645]}}$$

$$t = \frac{5.49}{\sqrt{4.75774}}$$

$$t = \frac{5.49}{2.1812} = \mathbf{2.516}$$

$$\boldsymbol{t = 2.516}$$

Testing the Hypothesis

The decision to accept or reject the hypothesis was determined using the results of a t-test. In this study, the t-test was applied with a significance level of 0.05 and a degree of freedom (df) calculated as (S. N. Sari & Aminatun, 2021).

Nx + Ny - 2 = 31 + 31 - 2 = 60.

The results showed that the calculated t-count exceeded the critical t-table, specifically: **t-count = 2.516 > t-table = 2.000** at **p = 0.05** with **df = 60**.

This comparison indicates that the t-count is greater than the t-table value, leading to the acceptance of the alternative hypothesis (Ha) and the rejection of the null hypothesis (Ho).

The Calculation of Effect Size

To show the strength of the effect, the researcher calculated the effect size.

The researcher used the formula of Cohen'd to calculate the effect size of the effect of Roblox Application between both classes.

$$d = \frac{M1 - M2}{SDpooled}$$

Mean:

d = effect size

M1 = the mean of experimental class

M2 = the mean of control class

SDpooled = the standart of deviation of both classes

To calculate the SDpooled, the researcher used the formula as follows:

$$SDpooled = \sqrt{\frac{SD1^2 + SD2^2}{2}}$$

Mean :

SDpooled = the standart of deviation of both classes

SD1 = standart deviation of experimental class

SD2 = standart deviation of control class

The size effect between the experimental and control groups were:

$$SDpooled = \sqrt{\frac{SD1^2 + SD2^2}{2}}$$

$$SDpooled = \sqrt{\frac{21.8^2 + 29.1^2}{2}}$$

$$SDpooled = \sqrt{\frac{475.24 + 132.25}{2}}$$

$$SDpooled = \sqrt{303.7} = 17.42$$

$$d = \frac{M1 - M2}{SDpooled}$$

$$d = \frac{78.55 - 71.61}{SDpooled}$$

$$\boldsymbol{d = \frac{6.94}{17.42} = 0.39}$$

The criteria of effect size can be classified: d < 0.2 as small effect, 0.2 < d < 0.8 as medium effect, and d > 0.8 as large effect. So, The standardized mean difference (Cohen's d) between the experimental and control groups in this study was 0.39, indicating a medium effect size (Sugiyono, 2013).

Findings

This study's findings showed that the effect of Roblox application had a significant positive influence for seventh-grade students' vocabulary mastery at SMP Negeri 37 Medan. The experimental group, which used Roblox in their learning, achieved a higher average score (78.55) than the control group (71.61), indicating better performance compared to conventional teaching methods (Mamaghe, Rombepajung, & Hampp, 2020).

Furthermore, the statistical analysis revealed that the t-value from the independent t-test was 2.516, which exceeded the critical t-table value of 2.000 at a 0.05 significance level with 60 degrees of freedom. Since the t-value was greater than the t-table value (2.516 > 2.000), the null hypothesis (H0) was rejected and the alternative hypothesis (Ha) was accepted. This confirms that using the Roblox Application significantly improves students' vocabulary mastery (Isterya, 2019).

Besides that, several features of Roblox contributed to this improvement. Roblox provides interactive environments and contextualized situations, where students encounter new words in meaningful contexts, such as game instructions, dialogues, and item descriptions. The application also offers visual and auditory supports, allowing learners to connect vocabulary with images, characters, and sounds, which enhances memory retention. Moreover, the collaborative and communicative nature of Roblox encourages students to read, listen, and respond to peers in English while playing, thereby reinforcing vocabulary acquisition through real-time interaction. The engaging and game-based nature of Roblox increases students' motivation and reduces learning anxiety, making them more active in using and remembering new words (S. K. Sari, 2017).

In addition, Roblox promotes experiential learning, where students do not only memorize vocabulary but also practice it while performing tasks in the game. For example, when students follow instructions such as "*collect the coins,*" "*build the house,*" or "*complete the quest,*" they directly apply the target vocabulary in action. This kind of learning-by-doing helps students internalize the meaning and usage of words more effectively compared to rote memorization (Muzdalifah, 2018). The repetitive exposure to these terms across different game scenarios also reinforces retention, leading to a more sustainable improvement in vocabulary mastery.

Discussion

This study indicate that the Roblox Application positively influences seventh-grade students' vocabulary mastery at SMP Negeri 37 Medan. The experimental group's mean score improved from 64.84 in the pre-test to 78.55 in the post-test, while the control group only increased from 63.38 to 71.61. The t-test result (t = 2.516 > 2.000) confirms that this difference is statistically significant at the 5% significance level, suggesting that the Roblox Application contributed meaningfully to enhancing students' vocabulary mastery.

This improvement is not merely numerical but also pedagogical. Roblox provides an interactive and immersive learning environment where students are exposed to new vocabulary through gameplay, in-game instructions, and peer communication. Such contextualized learning allows learners to internalize and apply vocabulary more effectively

compared to conventional methods, making the process more engaging and memorable (S. N. Sari & Aminatun, 2021).

The current results are in line with previous research. Marini and Salas (2023) highlighted that Roblox supports interaction, creativity, and social connection, all of which foster student engagement during learning. Likewise, Faridah and Deng (2024) reported that Roblox significantly increased engagement and reduced learning barriers in higher education. These findings support the conclusion of this study that Roblox fosters interest and motivation in learning, particularly because its 3D animation and collaborative features encourage creativity and active participation in the English learning process.

Similarly, Ramanujam and Hanita (2024), through a systematic review, concluded that Roblox and similar platforms create immersive and collaborative environments that promote vocabulary development and communication skills. This aligns with the present study's results, as students in the experimental group not only improved in vocabulary mastery but also collaborated with peers, discussed English words, and developed social connections with other players. Nevertheless, both teachers and parents are advised to monitor students' screen time and interactions to ensure safe and goal-oriented learning.

Furthermore, the findings resonate with Wicaksono et al. (2024), who found that high school students perceived Roblox positively for vocabulary acquisition through gameplay. However, they also noted challenges related to grammar and clarity of messages, emphasizing the importance of teacher guidance and structured classroom activities. This is relevant to the present study since students initially required teacher support to adapt to game-based vocabulary learning (Munigarim, Melani, Putera, & Arifuddin, 2024). When guided effectively, students' interest in the game environment facilitated vocabulary acquisition and encouraged them to apply new words in daily communication (Berliani & Katemba, 2021).

Other studies, including those by Wiyuna et al. (Suryadi, Hufad, & Leksono, 2022), and Azzahra et al. (2025), also emphasize the broader educational potential of Roblox in enhancing engagement, problem-solving, collaboration, and communication skills. These findings collectively reinforce the perspective that Roblox can serve as a versatile educational platform when thoughtfully integrated into the curriculum.

In addition, the effect size of this study strengthens the interpretation of its findings. Cohen's d was 0.39, which falls into the medium effect category ($0.2 < d < 0.8$). This indicates that the improvement observed among students using Roblox was not only statistically significant but also practically meaningful(SUTRA, 2024). Thus, Roblox can be considered an effective supplementary tool for vocabulary learning. However, its success largely depends on teacher facilitation, structured tasks, and the integration of activities that maintain students' focus on learning objectives while engaging with the platform (Yudhistiro & Silalahi, 2021).

CONCLUSION

The present investigation confirms that the Roblox Application significantly enhanced the vocabulary mastery of seventh-grade students at SMP Negeri 37 Medan.

Beyond statistical improvement, the integration of gamification elements such as interactivity, collaboration, and contextualized learning fostered motivation and deeper engagement, enabling students to acquire and apply new vocabulary in meaningful ways. These results demonstrate that game-based learning can serve as an effective supplementary medium in English language education, particularly when supported by teacher facilitation and structured classroom integration.

Despite these promising outcomes, the study was limited by its short duration and focus on a single school and grade level. Therefore, the results should be interpreted with caution when generalized to broader contexts. Future research is recommended to examine the long-term impact of Roblox on language development, its application to other language skills such as speaking, listening, and grammar, and its effectiveness across diverse age groups and educational settings. Mixed-method approaches may also provide deeper insights into learner motivation, engagement, and retention within game-based environments

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