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The Application of Digital Games and Its Effect on Vocabulary Improvement of the Second Grade Students at SMP Negeri 1 Tellu Siattinge

Yulia Udin Safitri[1*], Abidin Pammu[1], Nasmilah[1']

Hasanuddin University
Correspondence: yulia.safitri20@gmail.com

ABSTRACT

This research aimed to examine the extent the effective digital games in improving students' vocabulary and how digital games improved vocabulary to students. Nonrandomized quasi-experimental was employed in this quantitative approach. Participants were second grade students at SMP Negeri 1 Tellu Siattinge who were selected through purposive sampling technique. The independent variable in this research was digital games, while the dependent variable was vocabulary students' improvement. The experimental group was taught in English by using digital games to obtain better mean score of 49.65 than the control group of 27.01, this was proven through t_{test} value of 5.617 and t_{table} value of 2.007. Therefore, H_0 was rejected and H_1 was accepted, it based on the data analysis was interpreted to support on SPSS version 16. Thus, the use of digital games was found effective students' vocabulary improvement with a significant value of $p < 0.05$.

Keywords: Digital Games, Effect, Vocabulary Improvement

1. Introduction

In second language teaching and learning, vocabulary improvement plays an essential role in enhancing and improving language acquisition. Digital games can be used as learning media that facilitates language acquisition as digital games engage students in a competition. Prensky (2007) stated that well-organized competition involves one or several participants, objectives, boundaries, rules, interactions, challenges, rewards, and consequences, as well as aspects of competition (with other players or yourself).

Nowadays, learners are interested in learning English, especially middle school students. However, they often found difficulties with vocabulary. Meanwhile, according to Harmer (2007), vocabulary has been a core element of language that also receives attention from linguists as it is strongly influential on English language acquisition.

Felicia (2009) mentioned that digital games can motivate and immerse players. Further, she explained that digital games provide a broad range of auditory, tactile, visual, and cognitive stimulation that students find engaging. It could be assumed that digital games could help students to rote learning or memorization and it might assist them to improve their ICT skill as well. The variety of themes in digital games can assist students and instructors in acquiring new vocabulary.

The researcher found out that English teaching at Junior High School and University were different. The difference of both might occur due to different students' characteristics and learn motivation. Junior High School students were in the transition phase to become adults and they experienced changes in physical aspects, like ways of thinking, unstable emotions and experiencing tremendous social, moral, and also personality developments. Hence, in teaching vocabulary should be conveyed differently between adults and Junior High School students in happy and relaxing ambience which made students understood new vocabulary better. Some Junior High School students felt bored in vocabulary learning, Thus, they expected to learn English through games which exposed a lot of pictures and new vocabulary.

2. Literature Review

Many practitioners had been using digital games to improve students' vocabulary. In this research, the researcher analyzed prior studies

on relevant topic which showed digital games can help students to learn and apply their English vocabulary improvement. Digital games also allowed them to develop their abilities when they prepared for a discussion and made improvement from performing. Some prior research reviewed in this research were explained as follows.

Gros (2007) used digital games to facilitate better experiences, context, and learning. The research also examined the primary directions in using game-based learning. Furthermore, teachers should provide learning instrument and guidance that facilitate game-based learning for groups that enables learners learn various skills, competencies, and level up. It was also expected that practitioners had stronger awareness regarding the usefulness of digital games for learning activities in the near future.

Rasti-Bebahani (2021) found vocabulary an advantageous integral part of language learning. However, the teaching of vocabulary was quite challenging despite many methods had been proposed to address this challenge. Digital games successfully demonstrated effective in vocabulary learning. Most of digital game-based learning focused on task efficacy. Doubts on the effect of digital games for learning had been tackled. However, practitioners still demanded for more comprehensive knowledge regarding the task structure of digital game-based vocabulary learning and the extent to which it improved students' vocabulary learning.

Wu, Zhang, & Wang (2020) stated that digital games attracted experts' attention in relation to English vocabulary learning. Digital games had been widely used for learning yet scientific conclusion regarding the extent to which it influenced students' English vocabulary learning remained unknown. A report showed that digital game culled from English databases (Like WOS and ERIC) effective in improving students' vocabulary where meta-analysis was performed and heterogeneity was researched and results were presented depending on the strength of the effect.

Aghlara & Tamjid (2011) explained about how digital games affected the vocabulary retention in foreign language teaching among Iranian learners. In the experimental group, SHAIEx number game was used, whilst traditional methods were used to teach English vocabulary to control group. The results demonstrated higher average score of the experimental group than the control group. Number game had the favourable effect on the English vocabulary instruction for children. Digital games had positive benefits on learning processes as they increased students' learning motivation while they promoted students' cognitive development as well. Using such games in learning made learning significantly more pleasurable as they it reduced learning pressure.

Shahriarpour and Kafi (2014) stated that students typically memorized English vocabulary through rote memorization, which might be tedious due to a lack. Some previous researchers also found that game-based learning significantly contributed to the development of students' learning achievement and creativity. In the study, digital games were used to promote English vocabulary learning, particularly by using video games. Many adolescents spent the majority of their time playing digital games. Thus, it was considered necessary to utilize digital games for better purpose. It was beneficial for teacher to have greater knowledge about video games such as L.A. Noire. L.A. Noire can be utilized as learning media that enhances students' English vocabulary.

Regarding the aforementioned research findings, digital games may be used to in game-based learning activities for diverse groups of students with heterogeneous background in degrees of abilities, levels, and competences. Some elements of digital games can help students to improve their vocabulary while reducing their learning anxiety.

3. Method

This research was a quantitative research. Sukmadinata (2010) stated that quantitative research was grounded in positivism, a philosophy emphasizing on objective phenomena and related to numerical data, statistical processing, structure, and controlled experimentation. This study employed quasi-experimental research to examine the effective digital games namely Jeopardy! and Kahoot! on vocabulary improvement of students at SMP Negeri 1 Tellu Siattinge.

Pre-test and post-test nonrandomized mode was applied which compared the experimental group taught by using digital games and the control group taught by using lecturing method.

McMillian (2003) stated that population is the subject of a research which can be in the forms of humans, objects, animals, plants, symptoms and test scores, and data with characteristics.

The population of study was second grade students at SMP Negeri 1 Tellu Siattinge amounting to 81 students. There were three classes of second grades in the 2021/2022 school year, each class consisted of 27 students. The VIIIA class was assigned as the experimental group that was taught by using digital games of Jeopardy! and Kahoot! while the VIIIB was assigned as the control group that was taught by using lecturing method. The total samples were 54 students. In assigning the experimental and control groups, purposive sampling were performed as a part nonprobability sampling technique.

As the instrument in this research, the researcher collected the data of multiple choices test and cloze test. The multiple choices consisted 15 questions and the cloze test consisted 10 questions which referred to vocabulary of adjectives, nouns and verbs and related to the use of digital games.

4. Findings and Discussions

In this research, the data of pre-test and post-test were acquired from students. A pre-test had been administered prior to the treatment, while the post-test was administered after the treatment. The results of the tests were explained in the following section.

1. The Classification of Students' Pre-test and Post-test Scores

Pre-test was intended to evaluate students' initial vocabulary improvement before the treatment. The researcher calculated and classified students' scores on scale. Classified distribution was also employed to display the frequency of the students' scores since classified distribution was regarded more efficient and practical than unclassified distribution. Students' scores of pre-test for both experimental group and control group were classified as follows.

Table 1
The Percentage of Pre-test Scores Obtained by Experimental Group

No.	Classification	Score	Frequency	Percentage
1	Very good	86 – 100	-	-
2	Good	71 – 85	7	25.9%
3	Fair	56 – 70	20	74.1%
4	Poor	≤ 55	-	-
TOTAL			27	100%

As shown in Table 1, there were 27 students in the experimental group, 20 of which obtained fair score (74.1%), 7 students obtained (25.9%), while very good and poor were none (0%). In general, students' vocabulary improvement was categorized. In other way, the results showed that students' vocabulary improvement in the pre-test ranges of fair to good classification, and percentage of classification was low.

Table 2
The Percentage of Score of the Experimental Group in the Post-test

No.	Classification	Score	Frequency	Percentage
1	Very good	86 – 100	10	37%
2	Good	71 – 85	17	63%
3	Fair	56 – 70	-	-
4	Poor	≤ 55	-	-
TOTAL			27	100%

All students' results were presented in table 2, 10 students obtained very good score of (37%), 17 students (63%) obtained good score, while classification of fair and poor were none (0%). Students had their vocabulary to improve after the treatment. Students' vocabulary improvement based on the pre-test ranges of

good to very good. In other words, the results of post-test were better than the ones in the pre-test.

Table 3
The Percentage of Score of the Control Group in the Pre-test

No.	Classification	Score	Frequency	Percentage
1	Very good	86 – 100	-	-
2	Good	71 – 85	2	7.4%
3	Fair	56 – 70	25	92.6%
4	Poor	≤ 55	-	-
TOTAL			27	100%

Table 3 above showed the percentage of the score of the control group in the pre-test from 27 students. None (0%) of the students obtained very good and poor score. 2 students obtained good score (7.4%), and 25 students obtained fair score (92.6%). From the result the researcher concluded that the students' vocabulary improvement on pre-test ranges of fair to good classification. This indicated that the percentage of score of the control group in the pre-test was low.

Table 4
The Percentage of Score of the Control Group in the Post-test

No.	Classification	Score	Frequency	Percentage
1	Very good	86 – 100	2	7.4%
2	Good	71– 85	16	59.3%
3	Fair	56 – 70	9	33.3%
4	Poor	≤ 55	-	-
TOTAL			27	100%

The percentage of score of the control group in the post-test from 27 students as table 4 above showed that 2 students obtained very good (7.4%), 16 students obtained good score (59.3%), 9 students obtained fair score (33.3%), and none (0%) for poor. From the result, the researcher concluded that the students' vocabulary improvement on the pre-test ranges of good to very good and fair classification, and the percentage in the post-test was higher than the pre-test.

2. The Mean Score and Standard Deviation

The following Table 5 summarized, the mean score used to determine the gap between the scores from the pre-test and post-test scores obtained experimental group and control group.

Table 5
The Mean Score and the Standard Deviation

Types	Mean	Standard Deviation
Experiment	49.65	12.55
Control	27.01	17.56

Table 5. the mean score of the experimental group was 49.65 and standard deviation was 12.55. Meanwhile, the control group's mean score was 27.01, and the standard deviation was 17.56. The experimental group obtained statistically significant scores to compare o the control group. The control group scores seemed to have altered, despite the fact that the mean

score of the students in this group was lower than the experimental group. The experimental group made significant improvement of vocabulary than the control group.

Before conducting the independent sample t $_{test}$, the normality and homogeneity of the data had been determined. In the next subsections, the details of the normality and homogeneity test were presented.

Table 6

The Results of Normality Tests

		Experimental group	Control group
N		27	27
Normal Parameters[a]	Mean	49.6544	27.0093
	Standard Deviation	12.54790	17.5576
Most Extreme Differences	Absolute	.104	.166
	Positive	.089	.149
	Negative	-.104	-.166
Kolmogorov-Smirnov Z		.538	.864
Asymp. Sig. (2-tailed)		.934	.444
a. Test distribution is Normal.			

On table 6, it showed that *N* = 27 students. mean of experimental group was 49.6544 and control group was 27.0093. while standard deviation of experimental group was 12.54790 and standard deviation of control group was 17.5576 in normal parameters[a]. Then most extreme differences of experimental group in absolute was 0.104, positive was 0.089 and negative was -0.104 while absolute was 0.166, positive was 0.149 and negative was -0.166 on control group. Then, Kolmogorov-Smirnov Z = 0, 538 of experimental group and Z = 0.864 of control group. Then, as known that sig. score through Asymp. Sig. (2-tailed). On experimental group obtained 0.934 > 0.05 and control group obtained 0.444 > 0.05. Thus, it can be inferred that H_0 was accepted, and the data of both groups were normally distributed.

Table 7

The Results of Homogeneity of Variances

Percentage n Gain Score			
Levene Statistic	df1	df2	Sig.
.749	1	52	.391

As shown on table 7. It was evident that the significance value in the Sig. 0.391 greater than 0.05 implied that H_0 was accepted. Therefore, it was concluded that there was not different in variance among the control and the experimental groups (the data were homogeneous).

3. Independent Sample test

An independent t $_{test}$ was performed by using SPSS Version 16 to test the research hypotheses as follows.

(H_0) : The use of digital games was not effective in improving students' vocabulary.

(H_1) : The use of digital games was effective in improving students' vocabulary.

To determine mean score to experimental and control groups, a t $_{test}$ was conducted at a significance level (P)=0.05, and (df) n-2, where n1=27 and n2=27.

The results of the t $_{test}$ were presented in Table 8. Based on the aforementioned findings, digital games appeared to be a feasible strategy for improving students' vocabulary. The experimental group obtained higher mean score in post-test than the control group. The improvement of several points from the pre-test to the post-test after the treatment was categorized high.

Table 8
The Result of t_{test}

Variable	t_{test} Value	t_{table} Value	Sig. (2-tailed)
$y_1 - y_2$	5.617	2.007	.000

Table 8 showed that value of the t_{test} Value was 5.617. the t_{table} Value was 2.007 with significant level (P) = 0.05 and (df) = 52, then t_{test} Value was higher than t_{table} Value (5.617 > 2.007). Therefore, the hypothesis was accepted. The null hypothesis (H_0) was rejected and the alternative hypothesis (H_1) was accepted. It was concluded that the vocabulary improvement between students were taught by using digital games and those were taught by using lecturing method differed significantly, where experimental group made better improvement than the control group.

Digital games found effective improving in the vocabulary to second grade students based on the mean score and standard deviation in experimental and control groups. Digital games were regarded an effective strategy that can improve the instructional strategy in the class. In other word, digital games needed more students directed, and some students were able to adjust to improve their vocabulary.

The findings of this research indicated that the utilization of digital games successfully improved students' vocabulary. Likewise, Shahriarpour and Kafi (2014) also believed that digital games can increase students' learning motivation and shift the emphasis from rote teaching to meaningful teaching.

The test resulted in a significant difference between that value of the t_{test} Value was 5.617. The t_{table} Value was 2.007 with significant level (P) = 0.05 and (df) = 52, then t_{test} Value was higher than t_{table} Value (5.617 > 2.007). Hence, the null hypothesis was rejected, and hypothesis (H_1) was accepted. In the other word, digital games was more effective than lecturing method. Thus, the use of digital games was significantly higher improvement than using lecturing method in vocabulary.

So, in the activity during teaching and learning, the majority of students felt more energized and enthusiastic, because digital games facilitated simpler way of language acquisition. As stated by Prensky (2007), digital games provide students with student fun, intense and passionate engagement, structure, motivation, learning, adrenaline, creativity, social groupings and emotion in their learning activity. In other word, digital games were regarded a feasible media as it engaged students in a funny situation and interactive learning environment.

5. Conclusions

A significant difference is found between the vocabulary improvement of the experimental group and control group after treatment. During the learning activity by using digital games, students are more attracted to learn and show higher learning motivation as evidenced in significant score improvement in the post-test. Learning using digital games is regarded effective in improving the vocabulary of second-grade students at SMP Negeri 1 Tellu Siattinge. It also implies that digital games positively affects the teaching and learning process.

Digital games also allows students to enjoy the learning process while improving their vocabulary at the same time. As shown in the results of the t_{test} value is higher than t_{table} Value, indicating that the learning by using digital games is more effective in improving students' vocabulary than lecturing method. A proper choice of learning strategy can bring significant positive changes in the teaching and learning process, especially in Junior High School level.

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