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## The Effectiveness of Using Crossword Puzzle Games Through Student's Vocabulary Mastery

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### ABSTRACT

The purpose of this research was to find out whether there was an effect of using crossword puzzle games through students' vocabulary mastery and the significant differences before and after using crossword puzzle games through students' vocabulary mastery. The population of this research was eleventh students of Vocational High School 1 Banyuputih. XI AKL as the experimental class consisted of 25 students. For the sampling technique, the researcher used purposive sampling. In the getting data, it was obtained by using questionnaires filled out by students and used tests that divided into pre-test and post-test. This research method used quantitative research methods and conducted a pre-experimental design as the research design of this study with data testing using SPSS 16. Based on the analysis result of this research showed that the result of the T-test formula to test the hypothesis of this research insignificance 2 degree ( $\alpha$ ) of 5% is T-test ( $t_o$ ) > T-table (table) ( $18.90 > 1.713$ ). Therefore, the null hypothesis ( $H_0$ ) is rejected and the alternative hypothesis ( $H_a$ ) is accepted that there is a significant difference between students' vocabulary mastery before and after using crossword puzzle games.

## 1. Introduction

Vocabulary is one of the important language aspects in learning English. Having vocabulary, students are easier to understand the teacher's explanation and also help them in learning for skills above. According to Hilmy Hidayatullah "the existing materials for English teaching do not suit the need of the students. (Hidayatullah, 2019) Thus, the teaching and learning process of English subject is still facing various problems as shown by the student's unsatisfactory learning outcomes". Wilkins as cited in Scott Thornbury states that "without grammar very little can be conveyed, without vocabulary nothing be conveyed". (Thornbury, 2002) Hatch and Brown also stated the student's way to achieve vocabulary and recognize its works are always exciting for the teachers. (Brown, 1995) Regarding the importance of vocabulary, students need to learn vocabulary because vocabulary is the key to learning a language. From the statement above, the researcher infers that vocabulary refers to some words in a language and having meaning, many students assume that learning vocabulary only learns about words without knowing how it is used in the language. So the hard-to-mastery vocabulary has an impact to communicate using English. It can make the students lazy to learn English.

The students don't give attention when the teacher is explaining the material in the class. Furthermore, they just keep silent if the teacher asked them in English. So, students just acquire a few vocabularies. The researcher needs to implement a method that can make students interested in learning. Most of this situation is found in Vocational High School 1 Banyuputih too. The students are difficult to remember news vocabularies that they have learned. Therefore, the teacher has to find the best solution to make all the students can memorize the vocabulary that should be mastered enjoyably and effectively, one of the ways to do this is by applying an interesting game. The game that can be used to increase student vocabulary is a crossword puzzle. The crossword puzzle is a game that makes the teaching-learning process attractive. (Martin C. Njoroge, 2013)

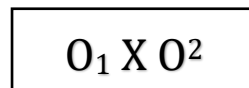
Furthermore, Hornby states that a crossword puzzle is a puzzle or a wordplay where the words have to be written related to numbered clues vertically or horizontally in blank space in the squares formed. (Hornby, 1995) All above explanations create inspiration to the researcher who wants to know how far crossword puzzles can improve student's vocabulary mastery and does meet the students in Vocational High School 1 Banyuputih? So the researcher is interested in research teaching vocabulary through a crossword puzzle. Therefore, this research is entitled "The Effectiveness of Crossword Puzzle Games through Students Vocabulary Mastery at The Vocational High School 1 Banyuputih".

This research is limited to the teaching vocabulary of the second grade of AKL Vocational High School 1 Banyuputih. The classroom taken for the sample of the research is XI AKL as the experimental group which will be given a crossword puzzle game. The classroom taken for the sample of the research is divided into two categories, they are grade XI AKL as the experimental group which will be given crossword puzzle method and XI TKJ as the control group will be taught without crossword puzzle. Based on the statement of the problem above, the research purposes are arranged as follows: To find out whether there is an effect of using crossword puzzle games through students' vocabulary mastery. And To find out significant differences in students' vocabulary mastery after using the crossword puzzle game.

## 2. Methods

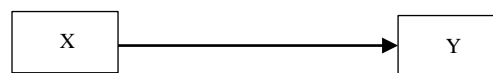
This research used the quantitative method. It is called the quantitative method because it is related to the calculation and analysis of numerical data. The design used in this research was

known as Experimental Research. Creswell said that an experimental, it tests an idea (practice or procedure) to determine whether it influences an outcome or dependent variable. (Creswell, 2009) This research used a pre-experimental experimental method with a one-group pretest-posttest design. In this design, there is a pretest and posttest, so that the effect of the treatment can be calculated by comparing the value of the data test. (Sugiyono, 2016) Thus the treatment results can be found to be more accurate and in this design, the research was conducted in one class. The implementation is done by doing a pretest, namely a test that is carried out before the treatment, then the treatment can be described as follows :



**Fig. 1.** Theoretical Framework of Study

Information : O<sub>1</sub> : Pre-test was carried out once, namely by doing the exercise pre-test about the vocabularies lesson  
 X : The treatment is carried out using a crossword puzzle game  
 O<sub>2</sub> : Post-test was conducted once, by doing the exercise post-test about the vocabularies lesson



**Fig. 2.** Theoretical Framework of Study 1

Information : X : Crossword puzzle  
 Y : Vocabulary mastery

From the theoretical framework above, the researcher assumed that the crossword puzzle game is considered an alternative strategy in teaching vocabulary which may increase students' memorization and their achievement in mastering vocabulary.

## 2.1 Research Sites

The location of this research is in Vocational High School 1 Banyuputih which is located at Jl. Ahmad Zaini Dahlan Bindung Sumberanyar village, Banyuputih sub-district, Situbondo regency. And this research was conducted from 16 April 2021 until 20 Mei 2021.

## 2.2 Population and Sample

The population of the research was the second-grade students of Vocational High School 1 Banyuputih, The amount of students of second grade in this school is 100 students. The sample is part of the number and characteristics of the population. The class chosen was XI AKL as the experimental group, which consists of 25 students. In this study, the researcher used Purposive Sampling. Purposive sampling is a technique

## 2.3 Research Instruments

A research instrument is a tool that can be used to obtain, process information data obtained from the respondent. (Augusty, 2014) An instrument can be said to be good and must meet five

criteria, namely, validity, reliability, sensitivity, objectivity, and facilities. (Sugiyono, 2017) This study uses an instrument in the form of 20 questionnaires using Like rt with 4 options, 10 questionnaires as a variable (X) and 10 questionnaires as variable (Y) and the researcher used the test in the form of pre-test and post-test that had been tried out before to know the validity and reliability

**Table 1.** Score Alternative Answer to the 1 Questions

Answer Alternatif	Score
Always (AL)	4
Often (O)	3
Somewhile (SW)	2
Never (N)	1

To collect data in this research, the researcher administered pre-test and post-test. The pre-test was given in experimental and controlled class to know how far the student's vocabulary understanding before receiving treatment. The post-test was given to know their vocabulary understanding after the treatment.

## 2.4 Data Analysis

To collect data in this research, the researcher administered pre-test and post-test. The pre-test was given in experimental class to know how far the student's vocabulary understanding before receiving treatment. The post-test was given to know their vocabulary understanding after the treatment. Before the researcher was given the pre-test, the researcher analyzed the instrument to know whether the instrument used in this study is valid and reliable before being used to collect data.

### 2.4.1 Validity Test

It is carried out to show the extent to which a measuring device measures what is being measured. Valid or not seen indicators use a significance level of 5% ( $\alpha = 0.05$ ), that is if  $R_{count} \geq R_{table}$ . To determine  $R_{count}$ , it is assisted by the SPSS version 16.0 For Windows program which is stated with the correct item-total correlation value.

### 2.4.2 Reliability Test

To determine the extent to which the measurement results remain consistent when two measurements are made of the same symptoms using the same tool. The variable is said to be reliable if the Cronbach Alpha ( $\alpha$ ) value is  $> 0.6$  in the study, it can be decided that the instrument is reliable (Sugiyono, 2012).

### 2.4.3 Normality Test

The examination of normality was needed to know whether the data has been normally distributed. The researcher used SPSS 16.00 to test the normality. In SPSS, there are two kinds of normality tests: Kolmogorov Smirnov and Shapiro-Wilk. The criterion of SPSS:

- 1) If respondents are  $\geq 50$ , the normality test uses Kolmograv Smirnov.
- 2) If respondents are  $\leq 50$ , the normality uses Shapiro Wilk.

The criterion of hypothesis is:

H0 : Significant Score > 0,05

H1 : Significant Score < 0,05

#### 2.4.4 Homogeneity Test

The next step was calculating the homogeneity of data. The purpose of this calculation was to see whether the data/sample in both classes were homogenous or heterogeneous.

#### 2.4.5 T-Test

After getting the data from pre-test and post-test from experimental and controlled classes, the researcher needs to find out the differences score using crossword puzzles as media. Here, the two classes are compared to the independent variable, the experimental class is the X variable and the controlled class is the Y variable. The statistical hypothesis of this study can be seen as:

Null Hypothesis (Ho): There is no significant difference after crossword puzzle strategy is used on students' vocabulary mastery in the second-grade students of Vocational High School 1 Banyuputih.

Alternative Hypothesis(Ha): There is a significant difference after crossword puzzle strategy is used vocabulary mastery in the second-grade students of Vocational High School 1 Banyuputih.

And then, the criteria used as follows:

- 1) If t-test ( $t_o$ ) > t-table ( $t_t$ ) insignificant degree of 0,05, Ho (null hypothesis) is rejected. It means that the rates of the mean score of the experimental group are higher than the controlled group. The use of crossword puzzles is effective towards students' vocabulary understanding.
- 2) If t-test ( $t_o$ ) < t-table ( $t_t$ ) insignificant degree of 0,05, Ho (the null hypothesis) is accepted. It means that the rates of the means score of the experimental group are the same as or lower than the controlled group. The use of crossword puzzles is not effective towards students' vocabulary understanding.

### 3. Result

The findings of this research deal with the data description, data analysis and test of hypothesis.

#### 3.1 Data Analysis

##### 3.1.1 Validity Test

From the results of the SPSS test, it can be seen that the Sig (2-tailed) value of the X variable and Y variable is less than < 0.05. Judging from the value of rcount and rtable that the value of rcount > rtable. The value of rtable is 0.3233 obtained from the value of  $N-2=25-2=23$ . The number 23 when viewed in the rtable through the significance value for one direction of 0.05 is 0.3365. So, the conclusion is that each indicator of the X and Y variables is valid so that the data can be used for the next stage.

##### 3.1.2 Reliability Test

The researcher calculated the reliability of using Cronbach's Alpha. From the variable test above, it can be seen that overall variables have Cronbach's Alpha values > 0.006, the reliability score that the researcher got is 0.954 which are as follows that variable value is 0.954 > 0.006.

### 3.1.3 Test of Normality GAIN

This test is used to know the difference result between pre-test and post-test. So, it can be seen the data will be influenced or not.

### 3.1.4 Normality Test

It aims to test whether the data used in the study is normally distributed or not. Can be seen in the table below:

Hypothesis:

$H_0$  : data of X normally distributed

$H_1$  : data of Y is not normally distributed

- a) Pre-test of experimental class, the normality data of pre-test of an experimental class has aims to test whether the data used in the study is normally distributed or not. The researcher used SPSS 16.00 to test the normality. Shapiro-Wilk is one of kind in SPSS that the researcher used and for the criterion from using Shapiro-Wilk is the respondent  $\leq 50$  respondents.

**Table 2.** The Normality of Pre-Test of Experiment Test

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Pre-test experiment	.131	25	.200*	.958	25	.379

a. Lillie for Significance Correction.

This is a lower bound of the true significance.

Based on the table above, it can be seen that the significance from the normality test of Shapiro-Wilk shows 0.379. Therefore, the significant score is higher than 0.05 ( $0.379 > 0.05$ ). It means that  $H_0$  is accepted so the data is normally distributed.

- b) Post-test of experimental class The normality data of post-test of an experimental class has aims to test whether the data used in the study is normally distributed or not. The researcher used SPSS 16.00 to test the normality. Shapiro-Wilk is one of kind in SPSS that the researcher used and for the criterion from using Shapiro-Wilk is the respondent  $\leq 50$  respondents.

**Table 3.** Normality Of Post-Test of Experiment Class

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Pre-test experiment	.129	25	.200*	.960	25	.411

a. Lilliefors Significance Correction

\*. This is a lower bound of the true significance.

Based on the table above, it can be seen that the significance from the normality test of Shapiro-Wilk shows 0.411. Therefore, the significant score is higher than 0.05 ( $0.411 > 0.05$ ). It means that  $H_0$  is accepted so the data is Normally Distributed.

According to the SPSS output table above, it can be seen that the value of Sig. So according to the basis for decision making in the normality test using the Shapiro-Wilk method above, it can be concluded that the data distribution is Normal.

### 3.1.5 Homogeneity Test

Based on the calculation of normality, the writer got the result that all data in pre-test and post-test of both experiment class and controlled class have been normality distributed. The next step of the calculation was finding the homogeneity of the data. The purpose of this calculation was to see whether the data/sample in both classes was homogenous or heterogeneous. Hypothesis: H0: the data is homogenous H1: the data is not homogenous

Based on the criteria, it can be concluded that H0 is accepted. It means that the sample in the experiment class was homogenous. Moreover, the writer also used SPSS to calculate the homogeneity of the data. The result that the researcher got can be seen in the table below:

**Table 4.** Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
.024	1	47	.878

Based on the table above, it can be seen that the result of the homogeneity test Lavene Statistic score shows 0.024 with a significant 0.878. Therefore, the significant score is higher than 0.05 ( $0.878 > 0.05$ ). It means that the sample in the experiment class was homogenous.

## 3.2 Data Interpretation

### 3.2.1 T-test

In this part, the researcher calculated the data to test the hypothesis that there is a significant difference between students' vocabulary understanding before and after using crossword puzzles in experiment class and students' vocabulary understanding.

**Table 5.** T-Test of N-Gained

	N	Mean	Std. Deviation	Std. Error Mean
NGain_percent	25	55.9085	14.79084	2.95817

The table of effectiveness interpretation category is a table that determined how the average value-effective or not an experiment and control class to improve student's vocabulary mastery.

**Table 6.** Effectiveness Interpretation Category

Effectiveness Interpretation Category	
Percentage (%)	Interpretation
< 40	Ineffective
40-55	Less Effective
56-75	Effective Enough
>76	Effective

Based on the output table above, it is known that the average value N-Gained is 55.9085 or if rounded to 56%. Based on the category table of value effectiveness interpretation of N-Gained (%) in the table above described that using crossword puzzles game in experiment class is effective enough through students' vocabulary mastery.

**Table 7.** T-Test of N-Gained

	Test Value = 0					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
NGain_per cent	18.900	24	.000	55.90846	49.8031	62.0138

Based on the results of the SPSS of one sample test output above, it is known that the significant value is  $18.900 > 0.05$ . It can be concluded that the N-Gained (%) variances data of the experiment class is homogenous.

### 3.2.2 Test of Hypothesis

The statistical hypotheses of this research can be seen as:

H<sub>0</sub> : there is no significant difference between students' vocabulary before and after using crossword puzzle games.

H<sub>a</sub> : there is a significant difference between students' vocabulary before and after using crossword puzzle games.

And then the criteria used as follows:

- If T-test ( $t_0$ ) > T-table ( $t_t$ ) insignificant degree of 0.05, H<sub>0</sub> (null hypothesis) is rejected.
- If T-test ( $t_0$ ) < T-table ( $t_t$ ) insignificant degree of 0.05, H<sub>0</sub> (null hypothesis) is accepted.

Based on the results of the SPSS of One-Sample Test output above, the researcher found  $t_0$  is 18.900 while T-table is  $N-2 = 25-2=23$ . The value of 0.05; 23 in the T-table is 1.713. Because the t-test value is  $18.900 > 1.713$ , it can be concluded that H<sub>0</sub> is rejected and H<sub>a</sub> is accepted, which means that "There is an influence of using crossword puzzle game (X) through student's vocabulary mastery (Y)".

## 4. Discussion

In the description of the data which was taken from 25 students of the experimental class, the researcher could explain briefly about the data got from the students before they were analyzed. The description of the experimental class has the mean of pre-test 29.41 before using crossword puzzles. It means the mean score is bad because it is lower than the standard minimum (KKM). After giving 2 times treatments for the experimental class using crossword puzzles, the writer got the mean of post-test 81.25. So, it is good because the mean score has reached KKM. Before testing the hypothesis, the researcher analyzed the normality and homogeneity of the data, the purpose of analyzing the normality was to see whether the data got in the research has been normally distributed or not.

The result normally can be seen by comparing the value of significant score to 0.05 meanwhile, the purpose of analyzing the homogeneity was to see whether the data/sample in the experimental



class was homogenous or heterogenous. In analyzing the normality, the result showed that both of the data of pre-test and post-test in experiment class was distributed normally.

According to the criteria of the test, it can be seen in the result that the significant score of pre-test (0.379) and post-test (0.411) of the experimental class was higher than 0.05 (0.379 and 0.411 > 0.05). Both of the data of pre-test and post-test in experimental class also showed that they were distributed normally. Based on the criteria, it can be concluded that  $H_0$  is accepted. It means that the sample in the experiment class was homogeneous.

The final calculation was testing the hypothesis. This was the main calculation to answer the problem of this research that whether there is a significant difference between students' vocabulary mastery using crossword puzzle games and without using crossword puzzle games.

The researcher used the T-test formula in the significance degree ( $\alpha$ ) of 5%. The result showed that T-test ( $t_0$ ) > t-table (18.90 > 1.713). It means that the t-test was higher than the t-table. So the null hypothesis ( $H_0$ ) is rejected. It means that the alternative hypothesis ( $H_a$ ) is accepted that there is a significant difference between students' vocabulary mastery before and after using crossword puzzle games.

## 5. Conclusion

Based on the research conducted at Vocational High School 1 Banyuputih in the academic year of 2020/2021 the researcher concluded that:

According to the result of pre-test and post-test from the experimental class. It shows that the lowest pre-test was 50 and the highest score was 76. Besides, the lowest score of the post-test was 70 and the highest score was 94. The average pre-test was 61.92 17 and the post-test was 83.36. It means that the crossword puzzle game is effective in improving students' vocabulary mastery.

Based on the analysis result of this research showed that the result of the T-test formula to test the hypothesis of this research in significance degree ( $\alpha$ ) of 5% is T-test ( $t_0$ ) > T-table ( $t_{table}$ ) (18.90 > 1.713). Therefore, the null hypothesis ( $H_0$ ) is rejected and the alternative hypothesis ( $H_a$ ) is accepted that there is a significant difference between students' vocabulary mastery before and after using crossword puzzle games.

Finally, based on the result, it was concluded that using crossword puzzle games is effective to improve students' vocabulary mastery in the teaching vocabulary at the XI AKL grade students of Vocational High School 1 Banyuputih in the academic year 2020/2021.

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