



CHAPTER III

RESEARCH METHODOLOGY

3.1 The Research Design

This study was a quasi-experimental design with equivalent pre-test and post-test without control-group focusing on quantitative research. This research compared two ongoing programs in two different groups. According to L. R Gay (2000: 353), the comparative design involves selecting two groups differing in some independent variables and comparing them with some dependent variables. The researcher selected two groups of participants usually referred to as experimental group 1 and experimental group 2, but more accurately referred to as a comparison groups. The groups may differ in a number of ways. One group may possess a characteristic that the other does not, one group may possess more of a characteristic than the other, or the two groups may have had different kinds of experience. According to Creswell, J. W (2009: 160), quasi-experimental design with nonequivalent pre-test and post-test is the most frequent used by the researchers. It involves selecting two groups without random assignment. Both groups take a pre-test and post-test. Both experimental groups receive the treatment. In this research, there were three variables; Crossword Puzzle Game (X1) and Thematic Dominoes Game (X2) were the independent variables, while the students' vocabulary mastery was the dependent variable. They can be drawn in the following table:

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Table 1. Research Design

EG1	O 1	X1	O 2
EG2	O 1	X2	O 2

(Gay, 2000: 353)

EG1 : Experimental Group 1

EG2 : Experimental Group 2

O 1 : Pre-test

O 2 : Post-test

X1 : Independent variable 1 (Crossword Puzzle Game)

X2 : Independent variable 2 (Thematic Dominoes Game)

3.2 The Location and the Time of the Research

This research was conducted at SMP N02 Sinaboi, Rokan Hilir Regency which is located at 10 Poros Street Sungai Bakau Village, Sinaboi sub-district Rokan Hilir Regency. The research was conducted for two months from July to August 2017.

3.3 Population and Sample of the Study

3.3.1 The Population of the Study

The population of the research was selected from the first year students of SMP N02 Sinaboi, Rokan Hilir Regency in the academic year 2016/2017. Two classes were used as the sample of the research by using cluster sampling. Gay (2000:129) states that cluster sampling randomly selects groups (not individuals) that have similar characteristics.

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Table 2.**Population of the second year students at SMP N 02 Sinaboi**

No	Class	Number of Students
1	VII A	25
2	VII B	25
Total	2	50

3.3.2 The Sample of the Study

The sample is usually taken from the population based on the type of the research to be carried out. According to Cresswell (2006) cluster sampling refers to randomly-selected groups, not individual and all members of selected groups have similar characteristics. In this research, the sample of the study was the first year students at SMP N02 Sinaboi, Rokan Hilir Regency in the academic 2016 – 2017 totaling 50 students; that is, VII A and VII B.

Table 3.**The second grade students of SMP N02 Sinaboi taken as the sample**

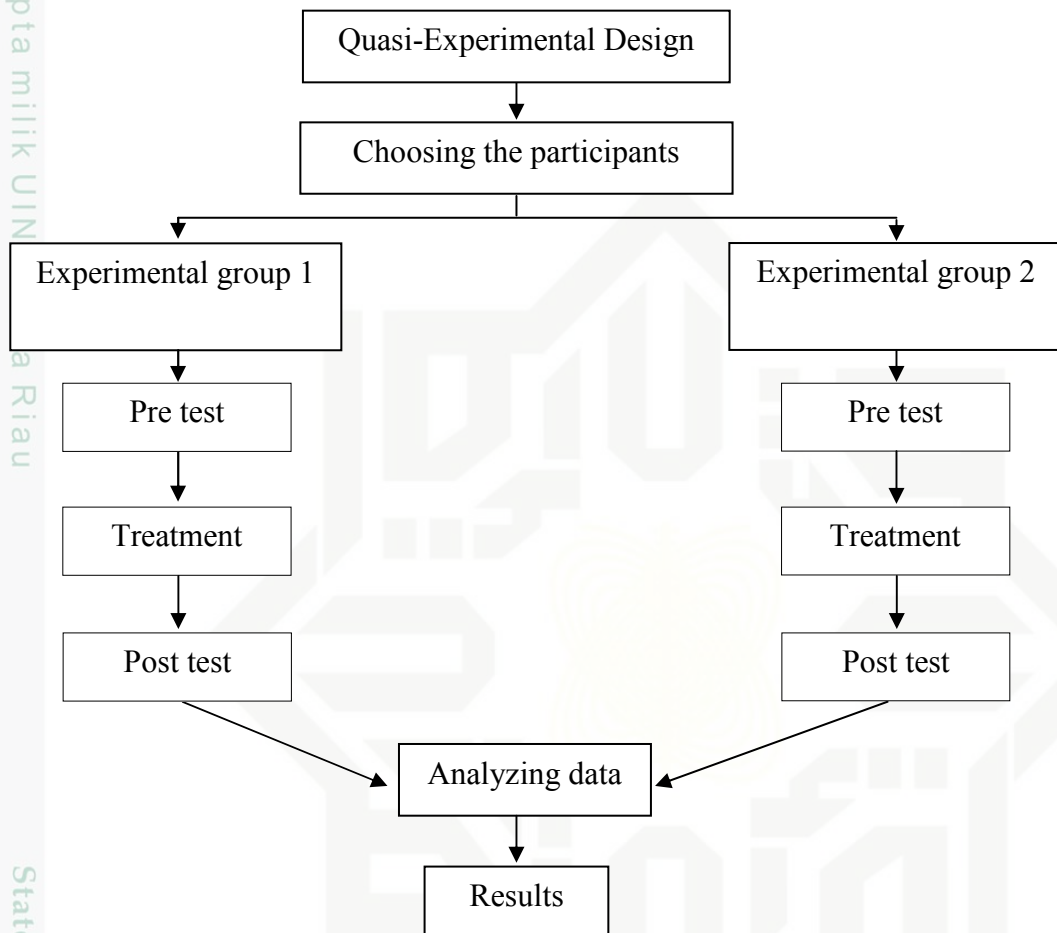
Class	Number of male students	Number of female students	Total
VII A	15	10	25
VII B	13	12	25
Total Sample			50

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3.4 Research Procedure

Figure 7



3.5 Research Instrument

Instrument plays an important role in collecting the data in a study. In this research, observation and test were used as the instruments to collect the data. Observation was used to see the application of strategies that were used by the teacher. And the test, specifically a vocabulary test was used to know or to measure the students' vocabulary mastery. Heaton (1975: 5) explains that a vocabulary test measures the students knowledge of the meaning of certain words and word groups. The tests was given to the experimental group 1 (VII A) before

and after they were taught using Crossword Puzzle Game 1 and Thematic Dominoes Game to the experimental group 2 (VII B). At the beginning, a pre test was given to both classes, experimental groups. And the post test was given after the treatment which aimed to find out the students' vocabulary mastery.

a. The instruments

The test was restricted things in the kitchen, things in a bag, things at the bathroom, family members, parts of human body, cardinal numbers and animals around us. As many as 35 items consisting of 24 items of multiple choice and 11 items of jumbled letters arrangement were tested to the students which were classified into three indicators: thirteen items to measure the students' understanding related to word meaning, eleven items to measure whether the students were able to put the words in context, and eleven others to measure whether the students were able to write the words in correct forms as presented in the following table:

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Table 4
Blue Print of Vocabulary Test Items

NO	INDICATORS	VOCABULARY AREAS	NUMBERS OF ITEMS	TOTAL ITEMS
1	Students are able to identify the meaning of the words	Things in a bag	4,6,16	13
		Things in a bathroom	21,22	
		Things in the kitchen	19,5	
		Family members	1	
		Parts of human body	11,12,13	
		Cardinal numbers	14	
		Animals around us	9	
2	Students are able to use the words in context	Things in the bag	8	11
		Family members	2	
		Things in the bathroom	7,10,23,15	
		Cardinal numbers	17	
		Parts of human body	18	
		Animals around us	3,20,24	
3	Students are able to write the words correctly	Family members	26,30	11
		Things in the bag	33	
		Things in the kitchen	29,34	
		Things in the bathroom	35,25	
		Parts of human body	28	
		Cardinal numbers	27,32	
		Animals around us	31	
TOTAL OF ALL ITEMS				35

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In addition, to know the level of students' achievement, the students' scores were classified into some levels which are tabulated in the following table:

Table 5

The Classification of Students' Vocabulary Mastery Scores

Scores	Categories
81 – 100	Excellent
61 – 80	Good
41 – 60	Mediocre
21 – 40	Poor
0 – 20	Very poor

b. Teacher training

To make sure the process of treatment could go smoothly, the English teacher of class VII A was trained how to apply the direct method with Crossword Puzzles Game in the class, whereas, the English teacher of class VII B was also trained how to implement the direct method with Thematic Dominoes Game.

c. Conducting a Try Out

A try out was administered in order to get reliable and valid items which were eligible to be used in this research. The try out was given to the students who did not participate in this research.



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d. Analyzing the Reliability and Validity of the Instrument

After conducting the try out, reliability and validity of the test were analyzed through SPSS 20 program. Finally, the reliable and valid items were used as the instrument in the pre-test and the post-test.

3.6 Data Collection Technique

In this research, the data was collected using two techniques. The first was by making the observation and then by giving a pre-test and a post-test.

3.6.1 Observation

Observation lists were used to observe directly how the process of vocabulary learning is by using Crossword Puzzle Game in the experimental class 1 and Thematic Dominoes Game in the experimental class 2 implemented. Further, it was done to see how far or whether the indicators of both direct method with crossword puzzle game and thematic dominoes games were fulfilled or not.

3.6.2 Test

To collect the data, a vocabulary test was administered in two stages: a pre-test and a post-test to the experimental class 1 and the experimental class 2. The test consisted of 25 items with 19 items of multiple choice and 6 items of jumbled letters arrangement. A pre-test was administered before the students were given a treatment. It was done to measure their vocabulary mastery before they were given the treatment. The experimental class 1 was taught using Crossword Puzzle Game and the experimental class 2 was taught

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by using Thematic Dominoes Game. Afterward, a post-test was given. It was done to see the students' improvement after getting the treatments. Finally, the entire test results were analysed to answer the research questions mentioned in chapter II.

3.7 Reliability and Validity Test

3.7.1 The Reliability of Instrument

Reliability refers whether the test is consistent in its score and gives us an indication of how the test score is accurate (Shohamy, 1985:70). It defines as the extent to which a test produces consistent results when it is administered under similar condition (Hatch and Farhady, 1982:243). In addition, Brown (2003) suggests that reliability has to do with the accuracy of measurement and that is it is important. The following table shows the level of internal consistency of Cronbach Alpha.

Table 6
The level of internal consistency of Cronbach Alpha

Cronbach Alpha	Internal Consistency
$\alpha \geq .9$	Excellent
$.9 > \alpha \geq .8$	Good
$.8 > \alpha \geq .7$	Acceptable
$.7 > \alpha \geq .6$	Questionable
$.6 > \alpha \geq .5$	Poor
$.5 > \alpha$	Unacceptable

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To obtain the reliability of the test given, Microsoft excel 2007 program was used to find out whether or not the test was reliable.

3.7.2 The Validity of Instrument

Creswell suggests that validity is the individual's scores from an instrument that make sense, meaningful, enable the researcher to draw good conclusions from the sample being studied to the population (Creswell 2008:169). It means that validity is the extent to which inferences made from assessment results are appropriate, meaningful and useful in terms of the purpose of the assessment. To analyze the validity of data, inter item validity was analyzed using Microsoft excel 2007 program. The following table shows the criteria of items validity.

Table 7

The criteria of items validity

R	Interpretation
$0,80 < r \leq 1,00$	Very High
$0,60 < r \leq 0,79$	High
$0,40 < r \leq 0,59$	Average
$0,20 < r \leq 0,39$	Low
$0,00 < r \leq 0,19$	Very Low

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3.8 The Result of Reliability and Validity of the Try Out

To find out the reliability and validity of the test, a try out was administered to those who were not the subject of the research. The try out was held on July 18, 2016. The participants of the try out were 28 students who were adopted from the second year students of SMP N02 SINABOI. The try out consisted of 35 items with 24 items of multiple choice and 11 items of jumbled letters arrangement. There were three indicators tested in the try out: (1) Identifying word meaning, (2) putting the words in context, and (3) writing the words in correct form. The results of the try out are shown in the following tables:

Table 8

Reliability Statistics

Cronbach's Alpha	N of Items
,857	35

The above table indicates that the value of Cronbach's alpha is 0.857. It means that the items are reliable in which the value of internal consistency is $.9 > .857 \geq .8$, so, it indicates that the reliability of the test is **Good**.

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Table 9
Validity of Instruments

Item	R	Interpretation of Validity	Status
1	0.452	Average	Valid
2	0.449	Average	Valid
3	0.201	Low	Invalid
4	0	Very Low	Invalid
5	0.602	High	Valid
6	0.750	High	Valid
7	0.585	Average	Valid
8	0.316	Low	Invalid
9	0	Very Low	Invalid
10	0.645	High	Valid
11	0.469	Average	Valid
12	0.526	Average	Valid
13	0.491	Average	Valid
14	0.365	Low	Invalid
15	0.709	High	Valid
16	0.619	High	Valid
17	0.484	Average	Valid
18	0.532	Average	Valid
19	0.636	High	Valid
20	0.534	Average	Valid
21	0.543	Average	Valid
22	0.434	Average	Valid
23	0.687	High	Valid
24	0.487	Average	Valid
25	0.606	High	Valid
26	0.426	Average	Valid
27	0.695	High	Valid
28	0.264	Low	Invalid
29	0.175	Very Low	Invalid
30	0.695	High	Valid
31	0.525	Average	Valid
32	0.255	Low	Invalid
33	0.403	Average	Valid
34	-0.095	Very Low	Invalid
35	0.177	Very Low	Invalid

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Based on Table 9, it is clear that fifteen items; item 1 (0.452), item 2 (0.449), item 7 (0.585), item 11 (0.469), item 12 (0.526), item 13 (0.491), item 17 (0.484), item 18 (0.532), item 20 (0.534), item 21 (0.543), item 22 (0.434), item 24 (0.487), item 26 (0.426), item 31 (0.525), and item 33 (0.403) classified into average and ten items ; item 5 (0.602), item 6 (0.750), item 10 (0.645), item 15 (0.709), item 16 (0.619), item 19 (0.636), item 23 (0.687), item 25 (0.606), item 27 (0.695) and item 30 (0.695) classified into high are valid. In contrary, five items; item 3 (0.201), item 8 (0.316), item 14 (0.365), item 28 (0.264) and item 32 (0.255) classified into low and five items; item 4 (0), item 9 (0), item 29 (0.175), item 34 (0.095) and item 35 (0.177) classified into very low are invalid. It means item 1, item 2, item 5, item 6, item 7, item 10, item 11, item 12, item 13, item 15, item 16, item 17, item 18, item 19, item 20, item 21, item 22, item 23, item 24, item 25, item 26 and item 27 are able to measure the students' vocabulary mastery, whereas, item 3, item 4, item 8, item 9, item 14, item 28, item 29, item 32, item 34 and item 35 have to be dismissed.

3.9 Data Analysis Technique

The data of the students' vocabulary before and after being taught by using Crossword Puzzles Games and Thematic Dominoes Games were analyzed statistically. The independent sample t-test and pair sample t-test were used using SPSS 20 version (Statistic Package for the Social Sciences).

3.9.1 Independent Sample T-test

To find out whether there was a significant difference or there was no significant difference between two or more variables can be analyzed

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by using Independent Sample T-test. Gay added that the t-test for independent sample is used to determine whether there is probably a significant difference between the means of independent samples t-test and dependent sample t-test that is used to find out the results of the first and second hypotheses.

The sig (2-tailed) had the function to see if there was a significant differences among the mean of the score of both experimental class 1 and experimental class 2 by using SPSS 20 version (Statistic Package for the Social Sciences). The sig (-tailed) score (p) was consulted with 0,05 , which is statistically hypothesized:

$$H_a: p < 0,05$$

$$H_o: p > 0,05$$

H_a was accept if $p / \text{sig (2-tailed)} < 0,05$ or there was significant differences after giving the treatment by using Crossword Puzzles Games and Thematic Dominoes Games toward students' vocabulary mastery.

H_o was accept if $p / \text{sig (2-tailed)} > 0,05$ or there was no significant differences after giving the treatment by using Crossword Puzzles Games and Thematic Dominoes Games toward students' vocabulary mastery.

To analyze the final-test scores of the experimental class 1 and experimental class 2, the following formula was used:

$$t = \frac{M_X - M_Y}{\sqrt{\frac{(SD_X)^2}{N_1 - 1} + \frac{(SD_Y)^2}{N_2 - 1}}}$$

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Where :

- T = The value of comparing two means
- M_X = Mean of the score in the pre-test of the experimental class 1
- M_Y = Mean of the score in the pre-test of the experimental group 2
- SD_X = Standard deviation of the experimental class 1
- SD_Y = Standard deviation of the experimental class 2
- N_1 = Number of the sample in the pre-test of the experimental class 1
- N_2 = Number of the sample in the pre-test of the experimental class 2
- 1 = the constant number

The t-table had the function to see if there was a significant difference among the mean of the scores of both experimental class 1 and experimental class 2. The t-obtained value was consulted with the value of t-table at the degree of freedom $(df) = (N_1 + N_2) - 2$ which is statistically hypothesized:

$H_a: t_o > t\text{-table}$

$H_o: t_o < t\text{-table}$

H_a was accepted if $t_o > t\text{-table}$ or there was significant differences after giving the treatment by using Crossword Puzzles Games and Thematic Dominoes Games toward students' vocabulary mastery.

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H_0 was accept if $t_0 < t$ -table or there was no significant differences after giving the treatment by using Crossword Puzzles Games and Thematic Dominoes Games toward students' vocabulary mastery.

3.8.2 Paired Sample t-Test

According to Gay (2000: 488) t-test for non independent samples is used to compare groups that are formed by some types of matching or to compare a single group's performance on a pre- test and post-test or on two different treatments. Paired Sample t-Test is known also as Non-independent sample t-test. In this time, paired sample T-test was used to find out whether there was a significant difference before and after giving the treatment by using Crossword Puzzle Game and Thematic Dominoes Game toward students' vocabulary mastery by using the pre-test and post-test score of the experimental class 1 and the experimental class 2.

The sig (2-tailed) had the function to see if there was a significant differences among the mean of the scores of both experimental class 1 and experimental class 2 by using SPSS 20 version (Statistic Package for the Social Sciences). The sig (-tailed) score (p) was consulted with 0,05 , which is statistically hypothesized:

$$H_a: p < 0,05$$

$$H_o: p > 0,05$$

H_a was accepted if $p / \text{sig (2-tailed)} < 0,05$ or there was significant differences after giving the treatment by using Crossword Puzzles Games and Thematic Dominoes Games toward students' vocabulary mastery.

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H_0 was accept if $p / sig (2\text{-tailed}) > 0,05$ or there was no significant differences after giving the treatment by using Crossword Puzzles Games and Thematic Dominoes Games toward students' vocabulary mastery.

To analyze the final-test scores of the experimental class 1 and experimental class 2, the following the formula of paired-sample t-test was used:

$$t = \frac{\bar{D}}{\sqrt{\frac{\sum D^2 - \frac{(\sum D)^2}{N}}{N(N-1)}}$$

D : Gain Score ($D=X_2-X_1$)

The t-table had the function to see if there was a significant difference among the mean of the score of both pre-test and post-test. The t-obtained value was consulted with the value of t-table at the degree of freedom (df) $N-1$ which is statistically hypotheses:

H_0 : $t_o < t\text{-table}$

H_a : $t_o > t\text{-table}$

H_0 was accepted if $t_o < t\text{-table}$ or there was no significant effect after giving the treatment by using Crossword Puzzle Game and Thematic Dominoes Game towards students' vocabulary mastery.

H_a was accepted if $t_o > t\text{-table}$ or there was significant effect after giving the treatment by using Crossword Puzzle Game and Thematic Dominoes Game towards students' Vocabulary mastery.

Hak Cipta Diindungi Undang-Undang

1. Diarangi mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber:
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah.
 - b. Pengutipan tidak merugikan kepentingan yang wajar UIN Suska Riau.
2. Diarangi mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin UIN Suska Riau.

Afterward, the coefficient effect of T-test was found out by using

following formula¹:

$$r^2 = \frac{t^2}{t^2+n-1}$$

$$kp = r^2 \times 100\%$$

Where:

Kp : Coefficient effect

r² : Coefficient

Afterward, the effect size of T-test was found out by using

following formula²:

$$\tilde{\eta}^2 = \frac{t^2}{t^2+n-1}$$

$$eta\ squared = \tilde{\eta}^2 \times 100\%$$

Where:

eta squared : Coefficient effect

$\tilde{\eta}^2$: Coefficient

With Effect Size Classification

0,2 <= d < 0,5 = small effect

0,5 <= d < 0,8 = medium effect

0,8 <= d <= 2,0 = large effect