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CHAPTER III (RESEARCH METHODOLOGY)

III.1. The Research Design

A comparative experiment was used in this research. It is a research design that involves collecting data on different population or under different conditions (e.g. times of year, locations) to make a comparison (TEA: 2007). According to Penn State, a comparative experiment starts with a question or hypothesis that asks how two or more treatments affect some response. To know the difference between the effects of treatment A and treatment B on dependent variable C, an experiment is run in which all of the conditions are the same except for one: the treatment --A or B--given to the subject. After receiving the results of the experiment, the researcher can then compare the difference in the dependent variable C for each treatment, concluding either that one treatment is more effective than the other one or that both treatments have about the same effectiveness.

In addition, Gay (2000, p.251) suggests that the experimental comparison is usually one of three types: 1. Comparison of two different approaches (A versus B); 2. Comparison of a new approach and the existing approach (A versus no A); 3. Comparison of different amount of a single approach (A little of A versus a lot of A)". Type 1 (comparison of two different approaches) was used in this research which comprised three variables: CWP Game (X1) and WSP Game (X2) are independent variables, while the students' vocabulary mastery is dependent

variable. The experimental class 1 was taught using crossword puzzle game, meanwhile the experimental class 2 was taught using word search puzzle game. Therefore, this research was aimed to find out a comparison of students' vocabulary mastery being taught using crossword puzzle game and word search puzzle game at SMP IT Bangkinang. Thus, the research design is described as follows:

G1	:	T1	X1	T2
G1	:	T1	X2	T2

Setiadi (2006: 135)

G1: Group one (Crossword Puzzle Group)

G2: Group two (Word Search Puzzle Group)

T1: Pre-test

T2: Post-test

X1: Treatment one (VII.A)

X2: Treatment two (VII.B)

Gay (2000:354) states that the definition and selection of comparison group are very important parts of the quasi experimental design procedure. The independent variable which differentiates the groups must be clearly and operationally defined for each group represents a different population. The way in which the group is defined will affect the generalize ability of the results.

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III.2. Location and Time of the Study

This study was carried out at SMP IT Bangkinang which is located at Jl.Bangkinang Lipat Kain Km.07 Ridam Permai. This study was conducted from November up to December 2016.

III.3. Population and Sample of the Study

III.3.1. Population of the Study

Population is a group of people or items from which the data are collected (Hadi, 1980:35). The population of this research was the first year students of SMP IT Bangkinang in the academic year 2016/2017 which consisted of four classes. Two classes (VII.A and VII.B) were male classes) and two others were female classes). Each of the class had the same number of students, 20 students. Thus, the total of the participants were 80 students. To see a clearer description about the population of this research, it is tabulated in the following table:

Table III.1
Population of the First Year Students' of SMP IT Bangkinang

Class	Male	Female	Total
VII A	20	0	20
VII B	20	0	20
VII C	0	20	20
VII D	0	20	20
Total			80

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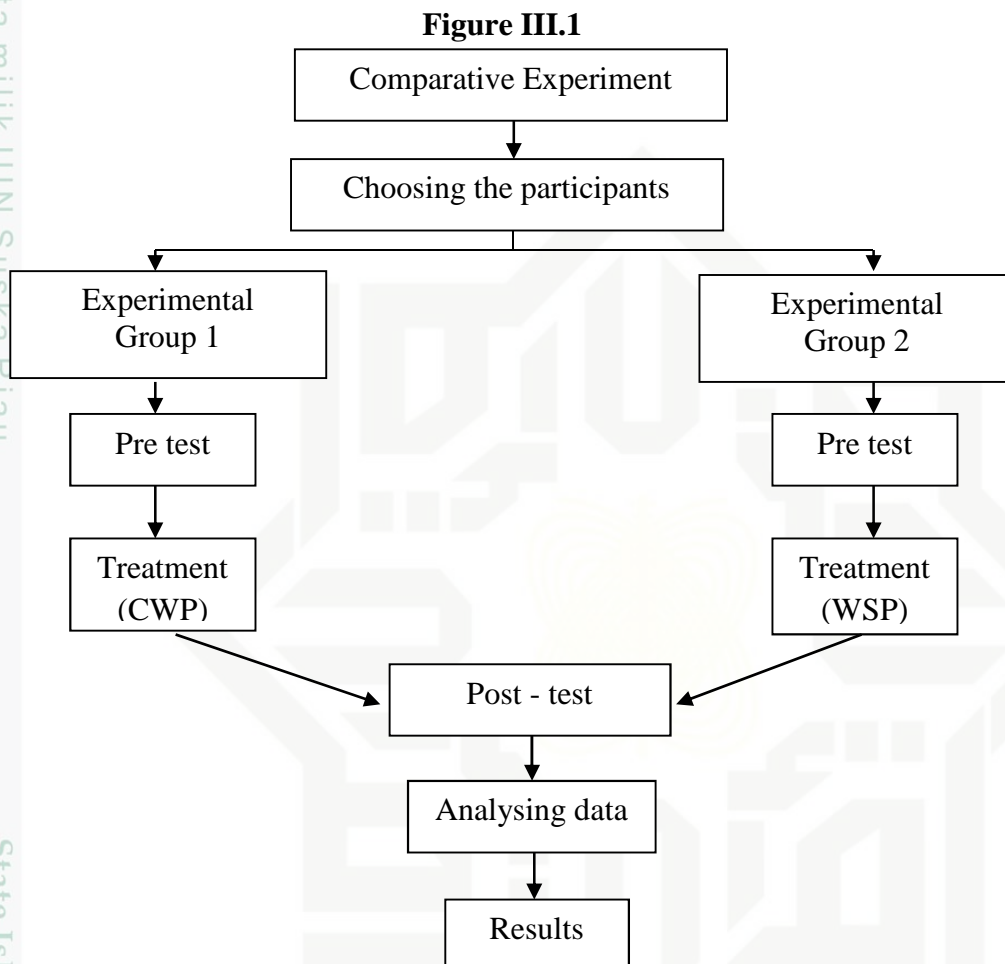
III.3.2. Sample of the Study

Best (1981:130) asserts that a sample is a small proportion of the population selected for observation and analysis. Additionally, Kerlinger (1965:118) states that a sample is a part of the population, which is supposed to represent the characteristics of the population. In this research, there were two classes chosen as sample (VII.A and VII.B). VII.A participated as an experimental group 1 and VII.B participated as an experimental group 2. The method used to select the sample of this study was cluster sampling. Gay (2000:129) states that cluster sampling randomly selects groups (not individuals) that have similar characteristics. The sample of the research is presented in the following table:

Table III.2
Sample of the Research

Class	Group	Male	Female	Total
VII A	Experimental Group 1	20	0	20
VII B	Experimental Group 2	20	0	20
Total				40

III.4. Research Procedures



Some procedures were passed through in completing this research. First of all, a pre-test was administered to the both experimental groups. It was conducted to see whether or not both of the groups were homogenous. Afterward, the experimental group 1 was taught by using CWP game and the experimental group 2 was taught by using WSP game. Each of the class was taught for four meetings or eight-hour class. After the treatments were completed, a post-test was conducted to see the students' vocabulary mastery improvement. Finally, the

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entire data of both pre-test and post-test score of both of the groups were analyzed using SPSS 20 program to answer the research questions mentioned in the chapter II.

III.5. Instrumentation

A. Pilot Study

A pilot study is a standard scientific tool for the scientific research that allows the researcher to conduct a preliminary analysis before omitting to a full-blown of study or experiment. It is a small scale preliminary study conducted in order to evaluate feasibility, time, cost, adverse events, and effect size (statistics varies) in an attempt to predict an appropriate sample size and improve upon the study design prior to the performance of a full-scale research project (Stephen B, 2007: 168-169).

1. Writing Proposal of the Research

This research entitled A comparison of Students' Vocabulary Mastery being Taught Using Crossword Puzzle and Word Search Puzzle Game at SMP IT Bangkinang. It was an comparative experiment which comprised three variables. They were Crossword Puzzle Game as X variable 1, Word Search Puzzle Game as X variable 2, and Vocabulary Mastery as Y variable. This research was carried out at SMP IT Bangkinang in November up to December 2016. The subjects of this research were the first year students. The samples of this research were adopted from students' class VII A and VII B.

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2. Preparations of the Study

In order to find out an optimal results and of which can be accounted of this research, some preparations should be fulfilled. The preparations were illustrated as follows:

a. Making Instruments

Instrument plays an important role in a research in order to collect data required in an experiment. Vocabulary test was administered in this research. The test was limited into things in the classroom, things in the bag, things at home, and animals around us. 35 items with 25 items of multiple choice and 10 items of jumbled letter arrangement were tested to the students which were classified into three indicators: fifteen items to measure the students' understanding related to word meaning, ten items to measure whether the students were able to put the words in context, and ten others to measure whether the students were able to write the words in the correct form. To get a clearer illustration, it is presented in the following table:

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Table III.3
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 the bag	1,2,4	15
		Things in the classroom	5	
		Things in the living room	3	
		Things in the bedroom	12,13,14,15	
		Things in the kitchen	9	
		Things in the dining room	10,11,18	
		Things in the bathroom	16,17	
2	Students are able to use the words in context	Things in the classroom	20	10
		Things in the living room	6	
		Things in the kitchen	8,19,21,22	
		Things in the bathroom	7	
		Animals around us	23,24,25	
3	Students are able to write the words correctly	Things in the classroom	26	10
		Things in the bedroom	28	
		Things in the kitchen	27,30,33,34	
		Things in the bathroom	29,35	
		Animals around us	31,32	
TOTAL OF ALL ITEMS				35

In addition, knowing the level of students' vocabulary mastery, the students' scores were classified into some levels which were tabulated in the following table:

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Table III.4

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

It is important to train the teacher in order that processes of implementing of the treatments run appropriately. English teacher of class VII A was trained how to implement the crossword puzzle games in the class, whereas, English teacher of class VII B was trained how to implement word search puzzle games.

c. Conducting a Try Out

The tryout was administered in order to get reliable and valid items which were eligible to use in this research. It was tested to the ones who did not participate in this research.

d. Analyzing Reliability and Validity of the Instrument

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



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III.6. Data Collection Technique

1. Vocabulary Test

To collect the data, vocabulary test was administered in two stages: pre-test and post-test to the experimental group 1 and the experimental group 2. The test consisted of 30 items with 21 items of multiple choice and 9 items of jumbled letters arrangement. A pre-test was administered before the students obtained 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 using word search puzzle game. Afterward, a post-test was given. It was done to see the students' improvement after getting the treatments. Finally, the entire of the test results were analyzed to answer the research questions mentioned in the chapter II.

III.7. Reliability and Validity of the test

III.7.1. Reliability of the test

Reliability refers to 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 reliability has to do with accuracy of measurement. That is why reliability is important to be measured. The following table is the level of internal consistency of Cronbach Alpha.

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Table III.5

The level of internal consistency of Cronbach' Alpha

Cronbach' Alpha	Internal Consistency
.9	Excellent
.9 > .8	Good
.8 > .7	Acceptable
.7 > .6	Questionable
.6 > .5	Poor
.5 >	Unacceptable

To obtain the reliability of the test given, SPSS 20 program was used to find out whether or not the test was reliable.

III.7.2. Validity of the test

Creswell suggests that validity is the individual's scores from an instrument make sense, meaningful, enable you, as the researcher, to draw good conclusions from the sample you are studying 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 analyse the validity of data, inter item validity was analysed using SPSS 20 program. The following table is the criteria of items validity.

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Table III.6
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

III.8. Results of the Reliability and Validity of the Try Out

To find out the reliability and validity of the test, a try out was administered to ones who were not subjected in this research. The try out was held on November 21, 2016. The participants of the try out were 20 students who were adopted from the second year students of SMP IT Bangkinang. The try out consisted of 35 items with 25 items of multiple choice and 10 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 the correct form. The result of the tryout was shown in the following tables:

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Table III.7**Reliability Statistics**

Cronbach's Alpha	N of Items
.874	35

Table III.7 displays that the value of cronbach's alpha is 0.874. It means that the items are reliable, in which the value of internal consistency is $.9 > .874$ $.8$, so, it indicates the reliability of the test is *Good*.

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Table III.8

Validity Items of Indicator 1 (Identifying the Word Meaning)

Item	R	Interpretation of Validity	Status
1	0.872	Very high	Valid
2	0.872	Very high	Valid
3	0.872	Very high	Valid
4	0.872	Very high	Valid
5	0.864	Very high	Valid
9	0.-034	Very low	Invalid
10	0.175	Very low	Invalid
11	0.175	Very low	Invalid
12	0.430	Average	Valid
13	0.530	Average	Valid
14	0.864	Very high	Valid
15	0.050	Very low	Invalid
16	0.872	Very high	Valid
17	0.567	Average	Valid
18	0.872	Very high	Valid

Based on table III.8, it shows item 1 (0.872), item 2 (0.872), item 3 (0.872), item 4 (0.872), item 5 (0.864), item 13 (0.530), item 14 (0.864), item 16 (0.620.8724), item 17 (0.567), and item 18 (0.872) are valid. In contrary, item 9 (0.-034), item 10 (0.175), item 11 (0.175), item 12 (0.034), and item 15 (0.050) are invalid. It means item 1, item 2, item 3, item 4, item 5, item 13, item 14, item 16, item 17, and item 18 are able to measure the students' vocabulary mastery in term of identifying word meaning, whereas, item 9, item 10, item 11, item 12, and item 15 have to be dismissed

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Table III.9

Validity Items of Indicator 2 Items (Putting the Words in Context)

Item	R	Interpretation of Validity	Status
6	0.701	High	Valid
7	0.701	High	Valid
8	0.701	High	Valid
19	0.595	Average	Valid
20	0.465	Average	Valid
21	0.465	Average	Valid
22	0.465	Average	Valid
23	0.624	High	Valid
24	0.708	High	Valid
25	0.701	High	Valid

Based on the table III.9, it is apparent that item 6 (0.701), item 7 (0.701), item 8 (0.701), item 19 (0.595), item 20 (0.465), item 21 (0.465), item 22 (0.465), item 23 (0.624), item 24 (0.708), and item 25 (0.701) are valid. It means item 6, item 7, item 8, item 19, item 20, item 21, item 22, item 23, item 24, and item 25 are able to measure the students' vocabulary mastery in terms of using the words in context.

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Table III.10

Validity Items of Indicator 3 Items (Writing the Words in Correct Form)

Item	R	Interpretation of Validity	Status
26	0.706	High	Valid
27	0.768	High	Valid
28	0.423	Average	Valid
29	0.370	Low	Invalid
30	0.762	High	Valid
31	0.706	High	Valid
32	0.739	High	Valid
33	0.686	High	Valid
34	0.616	High	Valid
35	0.539	Average	Valid

Based on table III.10, it shows item 26 (0.076), item 27 (0.0768), item 30 (0.762), item 31 (0.706), item 32 (0.739), item 33 (0.686), item 34 (0.616), and item 35 (0.539) are valid. In contrary, item 28 (0.423) and item 29 (0.370) are invalid. Thus, item 26, item 27, item 30, item 31, item 32, item 33, item 34, and item 35 were able to use to measure the students' vocabulary mastery in the term of writing words in the correct form. Whereas, item 28 and item 29 have to be dismissed.

III.9. Data Analysis Techniques

To analyze data, the scores of pre-test and post-test both in the experimental group 1 and 2 were collected. Afterward, a normality test was conducted to see whether the data were normally distributed or not. Finally, the results indicated

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that the data were not normally distributed. Besides, the number of participants of this research was relatively small. Therefore, the hypotheses tests were analysed using Non-Parametric Mann-Whitney U Test and Wilcoxon Signed-Ranke Test through SPSS 20.

1. Wilcoxon Signed-Rank Test

The Wilcoxon test is a non-parametric test that compares two paired groups. The test essentially calculates the difference between each set of pairs and analyses these differences. As the non-parametric equivalent of the paired student's-test, the Signed Rank can be used as an alternative to the t-test when the population data does not follow a normal distribution. In this research, it was used to test the hypotheses 1 and 2 as follows:

H_{a1}: Using crossword puzzle game has a significant effect on students' vocabulary mastery

H_{a2}: Using word search puzzle game has a significant effect on students' vocabulary mastery

If probability value < 0.05 , H_a is accepted

If probability value > 0.05 , H_a is rejected

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2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin UIN Suska Riau.

2. Mann-Whitney U Test

The Mann-Whitney U Test is the non-parametric alternative test to the independent sample t-test. It is a non-parametric test that is used to compare to sample means and used to test whether two sample means are equal or not. Usually, the Mann-Whitney U test is used when the data is ordinal or when the assumptions of the t-test are not met. Therefore, in this research it was used to test hypotheses 3 as follows:

H_{a3} : There is a difference of students' vocabulary mastery between students who are taught using crossword puzzle game and those who are taught using word search puzzle game.

If probability value < 0.05 , H_a is accepted

If probability value > 0.05 , H_a is rejected