CHAPTER IV
RESEARCH FINDING AND ANALYSIS

A. Description of the Research

To prove the effectiveness of using touch and go game in teaching vocabulary, between the students who were taught using touch and go game nad the students who were not taught using touch and go game, especially in SMP Askhabul Kahfi Semarang, the researcher did an analysis of quantitative data. The data was obtained by giving test to the experimental class and control class after giving a different learning both classes.

The subject of this research were divided into two classes. They were experimental class (VIIB) and control class (VIIA) of SMP Askhabul Kahfi Semarang. Before items were given to the students, the researcher gave try out test for try-out class (VIIIA) to analyze the validity, reliability, difficulty level, and also discriminating power of each item. The researcher prepare 20 items as the instrument of the test.

The researcher gave pre-test in control class and experiment class. After giving pre-test, the researcher determined the materials and lesson plans of learning activities. Pre-test conducted to both groups to know that two groups were normal and homogenity.

After knowing the control group and experimental group had same variant, the researcher conducted treatment to both group.

Learning in the experimental class used touch and go game, while the control class without used touch and go game.

After the data were collected, the researcher analyzed it. The first analysis data was from the beginning of control class and experimental class that was taken from the pre test value. It was the normality and homogenity test. It was used to know that two groups were normal and have same variant. Another analysis data was from the ending of control class and experimental class. It was used to prove the truth hypothesis that has been formulated.

B. Data Analysis and Hypothetical Test

1. Try out test analysis

This discussion covers validity, reliability, level of difficulty, and discriminating power.

a. Validity of Instrument

In this study, item validity is used to know the index validity of the test. To know the validity instrument, the researcher used the Pearson product moment formula to analyze each item.

It was obtained that from 20 test items, there were 15 items which were valid and 5 items which were invalid. They were on number 3,9,10,16, and 18. They were invalid with the reason computation result of their rxy value (the correlation of score each item) was lower than their r table value.

The following is the example of item validity computation for item number 1 and for the other items would use the same formula.

N= 36 ∑Y=523

∑XY =794 $\sum X^2$=52

∑X=26 $\sum Y^2$=15694

$$r_{xy} = \frac{N\sum XY - \sum(X)\sum(Y)}{\sqrt{\left\{N\sum X^2 - \left(\sum X\right)^2\right\}\left\{N\sum Y^2 - \left(\sum Y\right)^2\right\}}}$$

$$r_{xy} = \frac{36(794) - 26(253)}{\sqrt{\left\{36(52) - (26)^2\right\}\left\{36(15694) - (523)^2\right\}}}$$

$$r_{xy} = \frac{28584 - 6578}{\sqrt{(1196)(291455)}}$$

$$r_{xy} = \frac{28584 - 6578}{\sqrt{348580180}}$$

$$r_{xy} = 0.432$$

From the computation above, the result of computing validity of the item number 1 was 0,432. After that, the researcher consulted the result to the table of r Product Moment with the number of subject (N) = 36 and significance level 5% it is 0,329. Since the result of the computation is higher than r in table, the index of validity of the item number 1 is considered to be valid.

b. Reliability of Instrument

A good test must be valid and reliable. To get the coefficient of correlation, the researcher applied the product-moment formula and then continued to the spearman-brown formula. The formula of product moment as follow:

N= 36 $\sum Y=267$

$\sum XY =3822$ $\sum X^2=3660$

$\sum X=250$ $\sum Y^2=4174$

$$r_{xy} = \frac{N\sum XY - \sum(X)\sum(Y)}{\sqrt{\left\{N\sum X^2 - \left(\sum X\right)^2\right\}\left\{N\sum Y^2 - \left(\sum Y\right)^2\right\}}}$$

$$r_{xy} = \frac{36(3822) - 250(267)}{\sqrt{\left\{36(3660) - (250)^2\right\}\left\{36(4174) - (267)^2\right\}}}$$

$$r_{xy} = \frac{137592 - 66750}{\sqrt{(69260)(78975)}}$$

$$r_{xy} = \frac{137592 - 66750}{\sqrt{5469808500}}$$

$$r_{xy} = 0.4736$$

The result of 1 r_{xy} is applied to the reability formula:

$$r_{11} = \frac{2\ x\ r_{xy}}{1 + rxy}$$

$$r_{11} = \frac{2\ x\ 0{,}474}{\sqrt{1 + 0{,}47}}$$

$$r_{11} = 0{,}885$$

From the computation above, it is found out that r_{11} (the total of reliability test) is 0.885, whereas the number of subjects is 36 and the critical value for r-table with significance level 5% is 0.329. Thus, the value resulted from the computation is higher than its critical value. It could be concluded that the instrument used in this research is reliable.

c. Degree of the Test difficulty

The following computation of the level difficulty for the item number 1 and for the other items would use the same formula.

B = 16 + 11 = 27

JS = 35

$$P = \frac{B}{JS}$$

$$P = \frac{27}{35}$$

$$P = 0{,}77$$

From the computation above, the question number 1 can be said as the easy category, because the calculation result of the item number 1 was in the interval 0,70 < P < 1,00.

d. Discriminating Power

The following was the computation of for the discriminating power for item number 1, and for other items would use the same formula.

$$D = \frac{BA}{JA} - \frac{BB}{JB}$$

Before computed using the formula, the data devided into 2 (group). They were upper group and lower group.

Table 4.1

The Table of The Gathered Score of Item Number 1

Upper Group			Lower Group		
No	Code	Score	No	Code	Score
1	TO-17	1	1	TO-22	1
2	TO-26	1	2	TO-28	1
3	TO-6	1	3	TO-31	1
4	TO-11	1	4	TO-32	1
5	TO-27	1	5	TO-3	1
6	TO-5	1	6	TO-7	1
7	TO-8	0	7	TO-10	1
8	TO-12	0	8	TO-14	0
9	TO-21	1	9	TO-30	0
10	TO-23	1	10	TO-34	0
11	TO-29	1	11	TO-15	0
12	TO-33	1	12	TO-20	1

13	TO-1	1	13	TO-24	1
14	TO-2	1	14	TO-35	0
15	TO-4	1	15	TO-13	0
16	TO-9	1	16	TO-36	0
17	TO-16	1	17	TO-19	1
18	TO-18	1	18	TO-25	1
Total		16	Total		11

From the table above known as below:

BA = 16 BB = 11

JA = 18 JB = 18

$$D = \frac{BA}{JA} - \frac{BB}{JB}$$

$$D = \frac{16}{18} - \frac{11}{18}$$

$$D = 0{,}28$$

From the computation above, the question number 1 can be said as the medium category.because the calculation result of the item number 1 was in the interval $0{,}20 < D \leq 0{,}40$.

Based on the analysis of validity, reliability, difficulty level, and discriminating power, finally 15 items were accepted. They were number 1,2,4,5,6,7,8,11,12,13,14,15,17,19, and 20.

2. The Data Analysis of Pre Test Scores of The Experimental and Control Class

a. Test of Normality

Test of normality was used to find out whether data of control and experimental group which had been collected from the research come from normal distribution normal or not. The result computation of Chi-quadrate (X^2_{score}) then was compared with table of Chi-quadrate (X^2_{table}) by using 5% alpha of significance. If $X^2_{score} < X^2_{table}$ meant that the data spread of research result distributed normally.

Based on the research result of VII A students in the control group before they were taught vocabulary without Touch and Go Game, they reached the maximum score 70 and minimum score 40. The stretches of score were 30. So, there were 6 classes with length of classes 5. The average score ($\overline{X}$) was 61,33 and the standard of deviation (S) was 6,86. After counting the average score and standard deviation, table of observation frequency was needed to measure Chi-quadrate (X^2_{score}).

Table 4.2
Table of the Observation Frequency of Control Group

Class	Bk	Z_i	$P(Z_i)$	Ld	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
	39,5	-3,18	-0,4993				
40 – 45				0,0098	0,3	1	2,0510

	45,5	-2,31	-0,4895				
46 _ 51				0,0654	1,8	1	0,3329
	51,5	-1,43	-0,4240				
52 _ 57				0,2125	5,7	7	0,2784
	57,5	-0,56	-0,2116				
58 _ 63				0,3359	9,1	9	0,0005
	63,5	0,32	0,1243				
64 _ 69				0,2590	7,0	6	0,1410
	69,5	1,19	0,3833				
70 _ 75				0,0973	2,6	5	2,1414
	75,5	2,07	0,4806				
					X^2	=	4,9453

Based on the Chi-quadrate table (X^2_{table}) for 5% alpha of significance with dk 6-1 = 5, it was found X^2_{table} = 11, 07. Because of $X^2_{score} < X^2_{table}$, so the initial data of control group distributed normally.

While from the result of VII B students in experimental group, before they were taught vocabulary by using Touch and Go Game was found that the maximum score was 80 and minimal score was 50. The stretches of score were 30. So, there were 6 classes with length of classes 5. The average score ($\overline{X}$) was 61,07 and the standard deviation (S) was 7,98. After counting the average score and

standard deviation, table of observation frequency was needed to measure Chi-quadrate (X^2_{score}).

Table 4.3
Table of the Observation Frequency of Experimental Group

Class	Bk	Z_i	$P(Z_i)$	Ld	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
	49,5	-1,45	-0,4266				
50 _ 55				0,1690	4,6	10	6,4779
	55,5	-0,70	-0,2576				
56 _ 61				0,2790	7,5	7	0,0377
	61,5	0,05	0,0214				
62 _ 67				0,2684	7,2	6	0,2148
	67,5	0,81	0,2899				
68 _ 73				0,1505	4,1	3	0,2788
	73,5	1,56	0,4404				
74 _ 79				0,0492	1,3	2	0,3408
	79,5	2,31	0,4896				
80 _ 85				0,0093	0,3	1	2,2189
	85,5	3,06	0,4989				
					X^2	=	9,5688

Based on the Chi-quadrate table (X^2_{table}) for 5% alpha of significance with dk 6 – 1 = 5, it was found X^2_{table} = 11,07. Because of

$X^2_{score} < X^2_{table}$, so the initial data of experimental group distributed normally.

b. Test of Homogeneity

Test of homogeneity was done to know whether sample in the research come from population that had same variance or not. In this study, the homogeneity of the test was measured by comparing the obtained score (F_{score}) with F_{table}. Thus, if the obtained score (F_{score}) was lower than the F_{table} or equal, it could be said that the Ho was accepted. It meant that the variance was homogeneous. The analysis of homogeneity test could be seen in table 4.4.

Table 4.4

Test of Homogeneity (Pre-test)

Variance Sources	Experimental	Control
SUM	1710	1755
n	28	29
$\bar{x}$	61,07	60,52
Variance (s^2)	63,62	47,04
Standard of Deviation (s)	7,98	6,86

By knowing the mean and the variance, the writer was able to test the similarity of the two variants in the pre-test between experimental and control group. The computation of the test of homogeneity as follows:

$$F = \frac{BiggestVariance}{SmallestVariance}$$

$$= \frac{63,6243}{47,0443}$$

$$= 1,352$$

On a 5% with df numerator (nb - 1) = 28 – 1 = 27 and df denominator (nk – 1) = 29 – 1 = 28, it was found F_{table} = 1, 89. Because of $F_{score} \leq F_{table}$, so it could be concluded that both experimental and control group had no differences. The result showed both groups had similar variants (homogenous).

c. Test of difference two average in pre-test between experimental and control group

After counting standard of deviation and variance, it could be concluded that both group have no differences in the test of similarity between two variances in pre-test score. So, to differentiate whether the students' results of vocabulary in experimental and control group were significant or not, the researcher used t-test to test the hypothesis that had been mentioned in the chapter two. The researcher used formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Where:

$$S = \sqrt{\frac{(n_1 - 1)\, s_1^2 + (n_2 - 1)\, s_2^2}{n_1 + n_2 - 2}}$$

Based on table 4.4, first the researcher had to find out S by using the formula above:

$$S = \sqrt{\frac{(28-1)63{,}6243 + (279-1)\,47{,}0443}{28+29-2}}$$

$$= 7{,}429$$

After S was found, the next step was to measure t-test:

$$t = \frac{61{,}07 - 60{,}52}{7{,}429\sqrt{\frac{1}{28} + \frac{1}{29}}}$$

$$= 0{,}282$$

After getting t-test result, then it would be consulted to the critical score of t_{table} to check whether the difference is significant or not. For a = 5% with dk 28 + 27 – 2 = 53, it was found $t_{table(0.05)(53)}$ = 2,00. Because of $t_{score} < t_{table}$, so it could be concluded that there was no significance of difference between the experimental and control group. It meant that both experimental and control group had same condition before getting treatments.

3. The Data Analysis of Post Test Scores of The Experimental and Control Class

a. Test of Normality

Test of normality was used to find out whether data of control and experimental group, which had been collected after they got treatments, came from normal distribution normal or not. The formula, that was used, was Chi-quadrate. The result computation of Chi-quadrate (X^2_{score}) then was compared with table of Chi-quadrate (X^2_{table}) by using 5% alpha of significance. If $X^2_{score} < X^2_{table}$ meant that the data spread of research result distributed normally.

Based on the research result of VII A students in the control group after they got usual treatments (using text) in the teaching vocabulary, they reached the maximum score 85 and minimum score 50. The stretches of score were 35. So, there were 6 classes with length of classes 5. The average score ($\overline{X}$) was 70,34 and the standard of deviation (S) was 7,43. It meant that there was an improvement of students' score after they got treatments. After counting the average score and standard deviation, table of observation frequency was needed to measure Chi-quadrate (X^2_{score}).

Table 4.5

Table of the Observation Frequency of Control Group

Class	Bk	Z_i	$P(Z_i)$	Ld	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
	49,5	-2,80	-0,4975				
50 _ 55				0,0204	0,6	1	0,3681
	55,5	-2,00	-0,4771				
56 _ 61				0,0941	2,5	2	0,1152
	61,5	-1,19	-0,3830				
62 _ 67				0,2339	6,3	8	0,4488
	67,5	-0,38	-0,1491				
68 _ 73				0,3135	8,5	5	1,4176
	73,5	0,42	0,1644				
74 _ 79				0,2266	6,1	6	0,0023
	79,5	1,23	0,3910				
80 _ 85				0,0883	2,4	4	1,0960
	85,5	2,04	0,4793				
						χ^2 =	3,4479

Based on the Chi-quadrate table (X^2_{table}) for 5% alpha of significance with dk 6 – 1 = 5, it was found X^2_{table} = 11, 07. Because of $X^2_{score} < X^2_{table}$, so the data of control group after getting treatments distributed normally.

Meanwhile from the result of VII B students in experimental group who were taught vocabulary through the use of touch and go game, was found that the maximum score was 95 and minimal score was 60. The stretches of score were 35. So, there were 6 classes with length of classes 5. The average score ($\overline{X}$) was 75,00 and the standard deviation (S) was 8,16. By seeing the average score of students in experimental group, it could be concluded that there was an improvement of students' score after they got treatments by using touch and go game. After counting the average score and standard deviation, table of observation frequency was needed to measure Chi-quadrate (X^2_{score}).

Table 4.6

Table of the Observation Frequency of Experimental Group

Class	Bk	Z_i	$P(Z_i)$	Ld	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
	59,5	-1,90	-0,4712				
60 _ 65				0,0935	2,5	4	0,8629
	65,5	-1,16	-0,3777				
66 _ 71				0,2118	5,7	6	0,0139
	71,5	-0,43	-0,1659				
72 _ 77				0,2862	7,7	9	0,2097
	77,5	0,31	0,1203				
78 _ 83				0,2308	6,2	6	0,0086

	83,5	1,04	0,3511				
84 – 89				0,1111	3,0	0	2,9985
	89,5	1,78	0,4621				
90 – 95				0,0319	0,9	3	5,3250
	95,5	2,51	0,4940				
					χ^2	=	9,4186

Based on the Chi-quadrate table (X^2_{table}) for 5% alpha of significance with df 6 – 1 = 5, it was found X^2_{table} = 11, 07. Because of $X^2_{score} < X^2_{table}$, so the data of experimental group after getting treatments distributed normally.

b. Test of Homogeneity

The researcher determined the mean and variance of the students' score either in experimental or control group. By knowing the mean and variance, the writer was able to test the similarity of the two variance in the post-test between experimental and control group.

Table 4.7
Test of Homogeneity (Post-test)

Variance Sources	Experimental	Control
SUM	2100	2040
N	28	29
$\bar{x}$	75,000	70,345
Variance (s^2)	66,667	55,234
Standard Deviation (s)	8,165	7,432

The computation of the test of homogeneity as follows:

$$F = \frac{BiggestVariance}{SmallestVariance}$$

$$= \frac{66{,}6667}{55{,}2340}$$

$$= 1{,}207$$

On a 5% with df numerator (nb - 1) = 28 – 1 = 27 and df denominator (nk – 1) = 29 – 1 = 28, it was found $F_{table(0.05)(28:29)}$ = 1.889. Because of $F_{score} \leq F_{table}$, so it could be concluded that both experimental and control group had no differences. The result showed both groups had similar variance (homogenous).

c. Test of Difference Two Variants in Post Test Between Experimental and Control Group

After counting standard of deviation and variance, it could be concluded that both groups have no differences in the test of similarity between two variances in post-test score. So, to differentiate if the students' results of vocabulary in experimental and control group after getting treatments were significant or not, the writer used t-test to test the hypothesis mentioned in chapter two. To see the difference between the experimental and control group, the writer used formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Where:

$$S = \sqrt{\frac{(n_1 - 1)\, s_1^2 + (n_2 - 1)\, s_2^2}{n_1 + n_2 - 2}}$$

Based on table 4.7, first the writer had to find out S by using the formula above:

$$S = \sqrt{\frac{(28-1)66{,}6667 + (29-1)55{,}2340}{28+29-2}}$$

$$= 7{,}8004$$

After S was found, the next step was to measure t-test:

$$t = \frac{75{,}00 - 70{,}34}{7{,}8004\sqrt{\frac{1}{28} + \frac{1}{29}}}$$

$$= 2{,}252$$

After getting t-test result, then it would be consulted to the critical score of t_{table} to check whether the difference is significant or not. For a = 5% with dk 28 + 27 – 2 = 53, it was found $t_{table(0.05)(53)}$ = 1,67. Because of $t_{score} > t_{table}$, so it could be concluded that there was significance of difference between the experimental and control group. It meant that experimental group was better that control group after getting treatments.

Since the obtained t-score was higher than the critical score on the table, the difference was statistically significance. Therefore, based on the computation there was a significance difference between the teaching vocabulary using touch and go game and the teaching vocabulary without touch and go game for the seventh grade students of SMP Askhabul Kahfi Semarang. Teaching vocabulary using touch and go game seemed to be more effective than teaching vocabulary without touch and go game. It can be seen from the result of the test where the students taught vocabulary by using touch and go game got higher scores than the students taught vocabulary without touch and go game.

C. Limitation of The Research

The writer realized that there were some weaknesses in doing this research. There were constraints and obstacles faced during the research process. Some limitations of this research were :

1. The limited time of doing this reserach makes this reserach could not be done maximum.
2. The research was limited at SMP Askhabul Kahfi Semarang in the academic year of 2012/ 2013. So, that when research is conducted in other school, it is still possible that different result will be gained.
3. The lack of experiences and knowledge of the writer, makes implementation process of this research was far from ideally.

However, the researcher tried as maximal as possible to done this reserach.

Considering all those limitations, there is a willingness to do more reserach about teaching vocabulary using the same or different method. In the hope there will be more optimal result.