

## CAPTER IV

### RESEARCH FINDINGS AND DISCUSSIONS

In this chapter, the writer discussed the result of the study which covered the data presentation, the result of data analysis, and discussion.

#### A. Data presentation

This section consists of the measurement of central tendency (mean, median, and mode of each group score), the measurement of variability (standard deviation and standard error of the mean), some figures and tables of each group score and the discussion of the study.

#### 1. The Result of Pretest Experimental Group and Control Group

##### a. Distribution of Pretest Scores of the Experimental Group

The test scores of experimental group were presented in the following table:

**Table 4.1**

**The Description of Pre test. Scores of the Data Achieved  
By the Students in Experimental Group**

Student's Code	Score
E01	34
E02	40
E03	35
E04	45
E05	40
E06	50
E07	35

E08	50
E09	30
E10	40
E11	55
E12	59
E13	50
E14	37
E15	36
E16	45
E17	35
E18	35
E19	40
E20	56
E21	36
E22	55
E23	37
E24	36
E25	40
E26	45
E27	50
E28	30
E29	38
E30	40
E31	40
E32	35
E33	36

E34	55
E35	40

Based on the data above, it can be seen that the students' highest score was 59 and the student's lowest score was 30. To determine the range of score, the class interval, and interval of temporary, the writer calculated using formula as follows:

$$\text{The Highest Score (H)} = 59$$

$$\text{The lowest Score (L)} = 30$$

$$\begin{aligned} \text{The Range of Score (R)} &= H-L+1 \\ &= 59 - 30 + 1 \\ &= 29 + 1 = 30 \end{aligned}$$

$$\begin{aligned} \text{The Class Interval (K)} &= 1 + (3.3) \times \text{Log } n \\ &= 1 + (3.3) \times \text{Log } 35 \\ &= 1 + (3.3) \times 1,5440680444 \\ &= 6,0954245464 = 6 \end{aligned}$$

$$\text{Interval of Temporary} = \frac{R}{K} = \frac{30}{6} = 5$$

So, the range of score was 30, the class interval was 6, and interval of temporary was 5. It was presented using frequency distribution in the following table:

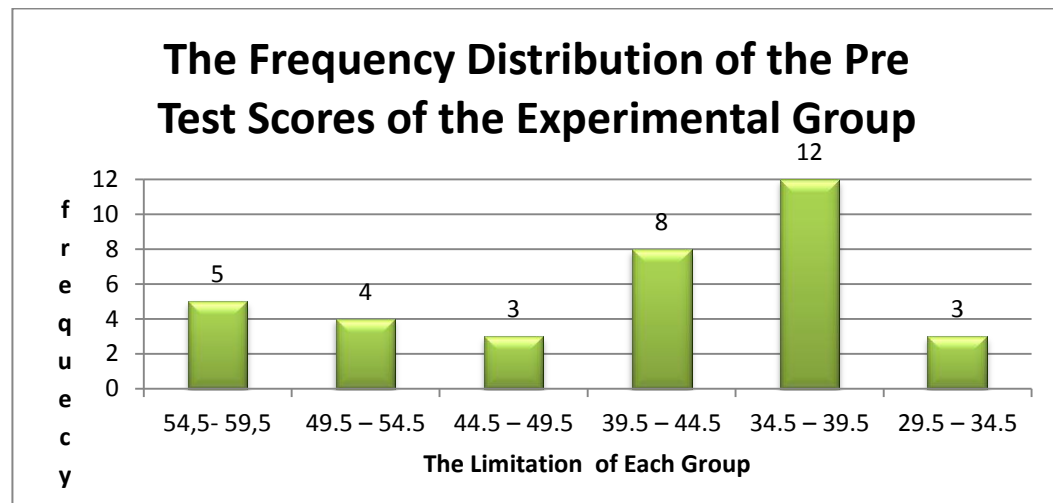
Table 4.2

## The Frequency Distribution of the Pre test. Score of the Experimental Group

Class (k)	Interval (I)	Frequency (F)	Mid Point	The Limitation of Each Group	Frequency Relative (%)	Frequency Cumulative (%)
1	55-59	5	57	54.5 – 59,5	14,3	100
2	50-54	4	52	49.5 – 54.5	11,4	85,7
3	45-49	3	47	44.5 – 49.5	8,6	74,3
4	40- 44	8	42	39.5 – 44.5	22,8	65,7
5	35- 39	12	37	34.5 – 39.5	34,3	42,9
6	30- 34	3	32	29.5 – 34.5	8,6	8,6
Total		$\Sigma F = 35$			100	

Figure 4.1

## The Frequency Distribution of Pretest Score of the Experimental Group



It can be seen from the figure above, the students' pretest scores in experimental group. There were three student who got score 29,5-34,5. There were twelve students who got score 34,5-39,5. There were eight students who got score 39,5-44,5. There were three students who got score 44,5-49,5. There were

four students who got score 49,5-54,5. And there was five students who got score 54,5-59,5.

The next step, the writer tabulated the scores into the table for the calculation of mean, median, and modus as follows:

**Table 4.3**

**The Calculating Mean, Median, and modus of Pretest Score of the Experimental Group**

Interval (I)	Frequency (F)	Mid Point (X)	FX	Fkb	Fka
55-59	5	57	285	35	3
50-54	4	52	208	30	8
45-49	3	47	141	26	12
40- 44	8	42	336	23	15
35- 39	12	37	444	15	23
30- 34	3	32	96	3	35
	$\Sigma F = 35$		$\Sigma Fx = 1510$		

**a) Mean**

$$\begin{aligned} M_x &= \frac{\sum fX}{N} \\ &= \frac{1510}{35} \\ &= 43,1 \end{aligned}$$

**b) Median**

$$\begin{aligned} M_{dn} &= l + \frac{\frac{1}{2}N - f_{kb}}{f_i} \times i \\ &= 39,5 + \frac{17,5 - 15}{8} \times 5 \end{aligned}$$

$$= 39,5 + 1,6$$

$$= 41,1$$

**c) Modus**

$$Mo = l + \left( \frac{fa}{fa+fb} \right) x i$$

$$= 39,5 + \frac{3}{3+12} x 5$$

$$= 39,5 + \frac{3}{15} x 5$$

$$= 39,5 + 0$$

$$= 39,5$$

The calculation above showed of mean value was 43,1, median value was 47,2 and modus value was 39,5 of the pre test of the experiment group. The last step, the writer tabulated the scores of pre test of experiment group into the table for the calculation of standard deviation and the standard error as follows:

**Table 4.4**

**The Calculation of the Standard Deviation and the Standard Error of the Pre Test Scores of experiment Group**

Interval (I)	Frekuensi (F)	Nilai Tengah (X)	x'	Fx'	x' <sup>2</sup>	Fx' <sup>2</sup>
55-59	5	57	3	15	9	45
50-54	4	52	2	8	4	16
45-49	3	47	1	3	1	3
40-44	8	42	0	0	0	0
35- 39	12	37	-1	-12	1	12

30-34	<b>3</b>	<b>32</b>	-2	-6	4	12
<b>Total</b>	N=35			$\sum Fx' = 8$		$\sum Fx'^2 = 88$

**a) Standard Deviation**

$$\begin{aligned}
 SD_1 &= i \sqrt{\frac{\sum Fx'^2}{N} - \frac{(Fx')^2}{N}} \\
 &= 5 \sqrt{\frac{88}{35} - \left(\frac{8}{35}\right)^2} \\
 &= 5 \sqrt{2,5143 - (0,2286)^2} \\
 &= 5 \sqrt{2,5143 - 0,0523} \\
 &= 5 \sqrt{2,462} \\
 &= 5 \times 1,5691 \\
 &= 7,81
 \end{aligned}$$

**b) Standard Error**

$$\begin{aligned}
 SEM_1 &= \frac{SD_1}{\sqrt{N_1 - 1}} \\
 &= \frac{7,81}{\sqrt{35 - 1}} \\
 &= \frac{7,81}{\sqrt{34}} \\
 &= \frac{7,81}{5,83} \\
 &= 1,34
 \end{aligned}$$

The result of calculation showed the standard deviation of pre test score of experiment was 7,81 and the standard error of pre test score of experiment group was 1,34.

The writer also calculated the data calculation of post test score of experimental group using SPSS 16 program. The result of statistic table is as follows:

**Table 4.5**

**The Table of Calculation of Mean, Standard Deviation, and Standard Error of Mean of Pre-Test Score in Experimental Group Using SPSS 16 Programs**

Statistics		
VAR00001		
N	Valid	35
	Missing	0
Mean		41.7143
Std. Error of Mean		1.33194
Median		40.0000
Std. Deviation		7.87988
Minimum		30.00
Maximum		59.00



The table showed the result of mean calculation was 41.7143. The result of standard deviation was 7.87988 and the result of standard error of mean calculation was 1.33194.

**b. Distribution of Pre Test Scores of the Control Group**

The pre test scores of the control group were presented in the following table:

**Table 4.6**

**The Description of Pretest Scores of the Data Achieved by the Students in  
Control Group**

<b>Student's Code</b>	<b>Score</b>
C01	68
C02	70
C03	50
C04	41
C05	56
C06	60
C07	65
C08	56
C09	60
C10	29
C11	55
C12	45
C13	50
C14	58
C15	50

C16	54
C17	70
C18	58
C19	48
C20	53
C21	59
C22	58
C23	50
C24	57
C25	53
C26	59
C27	56
C28	70
C29	64
C30	52
C31	68
C32	70
C33	36
C34	55
C35	40

Based on the data above, it can be seen that the students' highest score was 76 and the student's lowest score was 35. To determine the range of score, the class interval, and interval of temporary, the writer calculated using formula as follows:

$$\text{The Highest Score (H)} = 70$$

$$\text{The Lowest Score (L)} = 29$$

$$\begin{aligned} \text{The Range of Score (R)} &= H - L + 1 \\ &= 70 - 29 + 1 \\ &= 42 \end{aligned}$$

$$\begin{aligned} \text{The Class Interval (K)} &= 1 + (3.3) \times \text{Log } n \\ &= 1 + (3.3) \times \text{Log } 35 \\ &= 1 + (3.3) \times 1.5440680444 \\ &= 1 + (3.3) \times 1,5440680444 \\ &= 6,0954245464 = 6 \end{aligned}$$

$$\begin{aligned} \text{Interval of Temporary (I)} &= \frac{R}{K} = \frac{42}{6} \\ &= 7 \end{aligned}$$

So, the range of score was 42, the class interval was 6, and interval of temporary was 7. Then, it was presented using frequency distribution in the following table:

**Table 4.7**

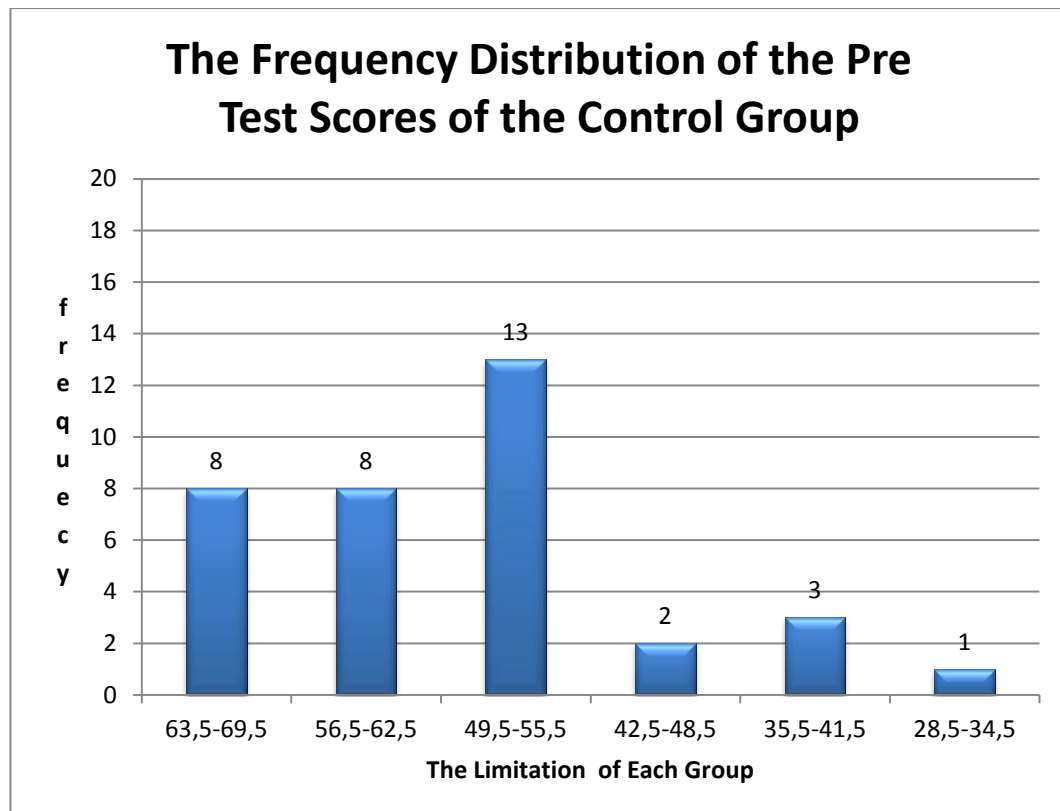
**The Frequency Distribution of the Pretest Scores of the Control Group**

<b>Class (k)</b>	<b>Interval (I)</b>	<b>Frequency (F)</b>	<b>Mid Point</b>	<b>The Limitation of Each Group</b>	<b>Frequency Relative (%)</b>	<b>Frequency Cumulative (%)</b>
<b>1</b>	64-70	8	67	63,5-69,5	22,9	100
<b>2</b>	57-63	8	60	56,5-62,5	22,9	77,1
<b>3</b>	50-56	13	53	49,5-55,5	37	54,2
<b>4</b>	43-49	2	46	42,5-48,5	5,7	17,2
<b>5</b>	36-42	3	39	35,5-41,5	8,6	11,5

6	29-35	1	32	28,5-34,5	2,9	2,9
<b>Total</b>		$\Sigma F$ 35			$\Sigma P = 100$	

Figure 4.2

### The Frequency Distribution of the Pre test Scores of the Control Group



It can be seen from the figure above, the students' pretest scores in control group. There were one students who got score 28,5-34,5. There were three students who got score 35,5-41,5. There were two students who got score 42,2-48,5. There were thirteen students who got score 49,5-55,5. There were eight students who got score 56,5-62,5. And there was eight student who got score 63,5-69,5.

The next step, the writer tabulated the scores into the table for the calculation of mean, median, and modus as follows:

Table 4.8

The Calculation of Mean, Median, and Modus of the Pre Test Scores of the Control Group

Interval (I)	Frequency (F)	Mid Point (X)	FX	Fkb	Fka
64-70	8	67	536	35	8
57-63	8	60	480	27	16
50-56	13	53	689	19	29
43-49	2	46	92	6	31
36-42	3	39	117	4	34
29-35	1	32	32	1	35
	$\Sigma F = 35$		$\Sigma FX = 1.946$		

## a) Mean

$$\begin{aligned} M_x &= \frac{\Sigma fX}{N} \\ &= \frac{1946}{35} \\ &= 55,6 \end{aligned}$$

## b) Median

$$\begin{aligned} M_{dn} &= l + \frac{\frac{1}{2}N - f_{k_b}}{f_i} \times i \\ &= 49,5 + \frac{17,5 - 6}{13} \times 7 \\ &= 49,5 + \frac{11,5}{13} \times 7 \\ &= 49,5 + 6,19 \\ &= 55,7 \end{aligned}$$

c) **Modus**

$$\begin{aligned}
 Mo &= l + \left( \frac{f_a}{f_a + f_b} \right) \times i \\
 &= 49,5 + \left( \frac{6}{4 + 2} \right) \times 7 \\
 &= 49,5 + \left( \frac{6}{6} \right) \times 7 \\
 &= 49,5 + 7 \\
 &= 56,5
 \end{aligned}$$

The calculation above showed of mean value was 55,6 median value was 55,7 and modus value was 56,5 of the pre test of the control group.

The last step, the writer tabulated the scores of pre test of control group into the table for the calculation of standard deviation and the standard error as follows:

**Table 4.9**

**The Calculation of the Standard Deviation and the Standard Error of the Pre Test Scores of Control Group**

Interval (I)	Frekuensi (F)	Nilai Tengah (X)	$x'$	$Fx'$	$x'^2$	$Fx'^2$
64-70	8	67	3	24	9	72
57-63	8	60	2	16	4	32
50-56	13	53	1	13	1	13
43-49	2	46	0	0	0	0
36-42	3	39	-1	-3	1	3
29-35	1	32	-2	-2	4	4

<b>Total</b>	N=35			$\sum Fx' = 48$		$\sum Fx'^2 = 124$
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**a) Standard Deviation**

$$SD_2 = i \sqrt{\frac{\sum Fx'^2}{N} - \frac{(Fx')^2}{N}}$$

$$SD_2 = 7 \sqrt{\frac{124}{35} - \left(\frac{48}{35}\right)^2}$$

$$SD_2 = 7 \sqrt{3,543 - 1,371}$$

$$SD_2 = 7 \sqrt{2,172} = 1,474$$

$$SD_2 = 7 \times 1,474$$

$$SD_2 = 10,318$$

**b) Standard Error**

$$SEM_2 = \frac{SD_2}{\sqrt{N_1 - 1}}$$

$$SEM_2 = \frac{10,318}{\sqrt{35 - 1}}$$

$$SEM_2 = \frac{10,318}{\sqrt{34}}$$

$$SEM_2 = \frac{10,318}{5,83}$$

$$SEM_2 = 1,769$$

The result of calculation showed the standard deviation of pre test score of control group was 10,318 and the standard error of pre test score of control group was 1,769

The writer also calculated the data calculation of post test score of experimental group using SPSS 16 program. The result of statistic table is as follows:

**Table 4.10**

**The Table of Calculation of Mean, Standard Deviation, and Standard Error of Mean of Pre-Test Score in Control Group Using SPSS 16 Programs**

Statistics		
VAR00001		
N	Valid	35
	Missing	0
Mean		55.5143
Std. Error of Mean		1.65279
Median		56.0000
Std. Deviation		9.77804
Minimum		29.00
Maximum		70.00

The table showed the result of mean calculation was 55,5. The result of standard deviation was 9,77 and the result of standard error of mean calculation was 1,652.

## 2. The Result of Post-test Experimental Group and Control Group

### a. Distribution of Post Test Scores of the Experimental Group

The post test scores of experimental group were presented in the following table:



**Table 4.11**

**The Description of Post Test Scores of the Data Achieved by the Students in  
Experimental Group**

<b>Student's Code</b>	<b>Score</b>
E01	75
E02	70
E03	67
E04	70
E05	74
E06	56
E07	79
E08	70
E09	75
E10	66
E11	70
E12	87
E13	70
E14	66
E15	65
E16	70
E17	66
E18	75
E19	63
E20	75
E21	74
E22	87

E23	87
E24	62
E25	87
E26	66
E27	87
E28	66
E29	74
E30	62
E31	74
E32	70
E33	58
E34	58
E35	60

The Highest Score (H) = 87

The Lowest Score (L) = 58

The Range of Score (R) =  $H - L + 1$   
 $= 87 - 58 + 1$   
 $= 30$

The Class Interval (K) =  $1 + (3.3) \times \text{Log } n$   
 $= 1 + (3.3) \times \text{Log } 35$   
 $= 1 + (3.3) \times 1,544$   
 $= 1 + 1,544$   
 $= 6,0954245464$   
 $= 6$

$$\begin{aligned} \text{Interval of Temporary (I)} &= \frac{R}{K} = \frac{30}{6} \\ &= 5 \end{aligned}$$

So, the range of score was 30, the class interval was 6, and interval of temporary was 5. It was presented using frequency distribution in the following table:

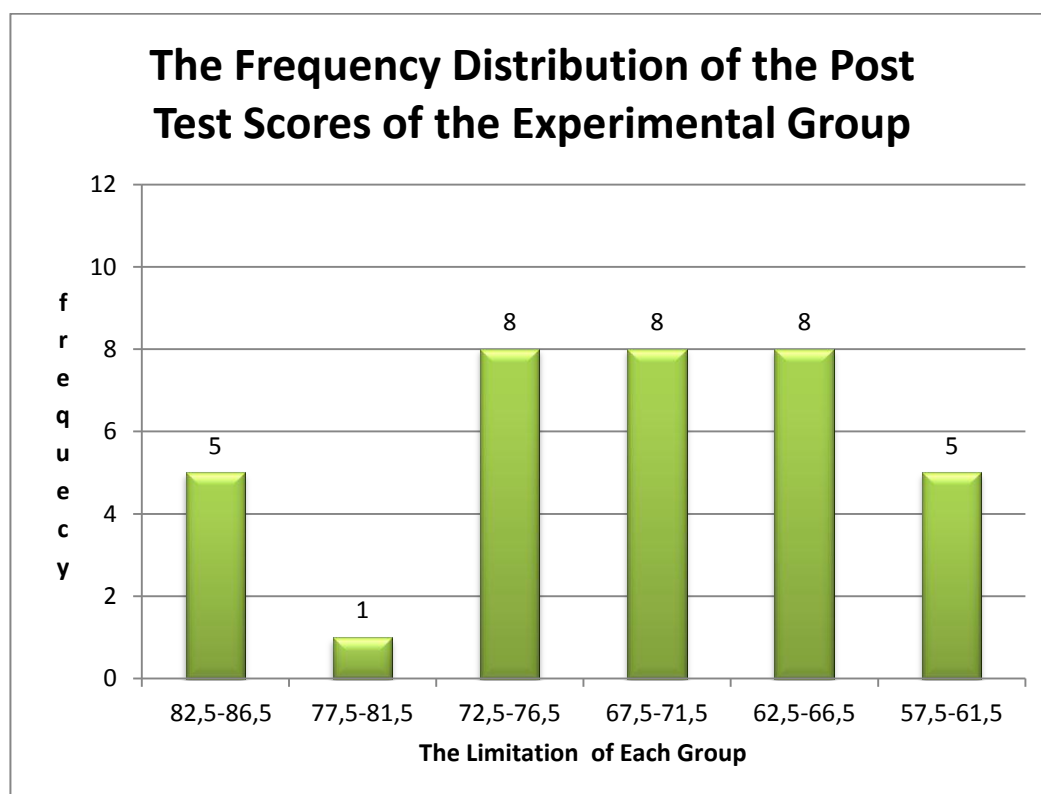
**Table 4.12**

**Frequency Distribution of the Pos-Test Score of the Experimental Group**

<b>Class (k)</b>	<b>Interval (I)</b>	<b>Frequency (F)</b>	<b>Mid Point</b>	<b>The Limitation of Each Group</b>	<b>Frequency Relative (%)</b>	<b>Frequency Cumulative (%)</b>
1	83-87	5	85	82,5-86,5	14,29	100
2	78-82	1	80	77,5-81,5	2,85	85,71
3	73-77	8	75	72,5-76,5	22,86	82,86
4	68- 72	8	70	67,5-71,5	22,86	60
5	63- 67	8	65	62,5-66,5	22,86	37,14
6	58- 62	5	60	57,5-61,5	14,28	14,28
<b>Total</b>		$\Sigma F = 35$			<b>100</b>	

Figure 4.3

## The Frequency Distribution of Pos-test Score of the Experimental Group



It can be seen from the figure above, the students' pretest scores in experimental group. There were five students who got score 82,5-86,5. There was one student who got score 77,5-81,5. There were eight students who got score 72,5-76,5. There were eight students who got score 67,5-71,5. There were eight students who got score 62,5- 66,5. And there was five student who got score 57,5-61,5.

The next step, the writer tabulated the scores into the table for the calculation of mean, median, and modus as follows.

Table 4.13

**The Calculating Mean, Median, and Modus of Post-test Score of the  
Experimental Group**

Interval (I)	Frequency (F)	Mid Point (X)	FX	Fkb	Fka
83-87	5	85	425	35	5
78-82	1	80	80	30	6
73-77	8	75	600	29	14
68- 72	8	70	560	21	22
63- 67	8	65	520	13	30
58- 62	5	60	300	5	35
	$\sum F = 35$		$\sum FX = 2485$		

a) Mean

$$\begin{aligned} M_x &= \frac{\sum fX}{N} \\ &= \frac{2485}{35} \\ &= 71 \end{aligned}$$

b) Median

$$\begin{aligned} M_{dn} &= l + \frac{\frac{1}{2}N - f_{k_b}}{f_i} \times i \\ &= 67,5 \frac{17,5 - 13}{8} \times 5 \\ &= 67,5 + 2,81 \\ &= 70,31 \end{aligned}$$

c) Modus

$$M_o = l + \left( \frac{f_a}{f_a + f_b} \right) \times i$$

$$= 67,5 + \frac{8}{8+5} \times 5$$

$$= 67,5 + \frac{8}{13} \times 5$$

$$= 67,5 + 3,1$$

$$= 71$$

The calculation above showed of mean value was 71, median value was 75,31 and modus value was 75,6 of the Pos test of the Experiment group.

The last step, the writer tabulated the scores of pre test of experiment group into the table for the calculation of standard deviation and the standard error as follows:

**Table 4.14**

**The Calculation of the Standard Deviation and the Standard Error of the Post Test Scores of experiment Group**

Interval (I)	Frequency (F)	Mid Point (X)	x'	Fx'	x' <sup>2</sup>	Fx' <sup>2</sup>
83-87	5	85	3	15	10	50
78-82	1	80	2	2	4	4
73-77	8	75	1	8	2	64
68- 72	8	70	0	0	0	0
63- 67	8	65	-1	-8	1	64
58- 62	5	60	-2	-10	4	9
	$\Sigma F = 35$			$\Sigma Fx' = 43$		$\Sigma Fx'^2 = 191$

**a) Standard Deviation**

$$\begin{aligned}
SD_3 &= i \sqrt{\frac{\sum Fx'^2}{N} - \frac{(Fx')^2}{N}} \\
&= 5 \sqrt{\frac{191}{35} - \left(\frac{43}{35}\right)^2} \\
&= 5 \sqrt{5,457 - (1,229)^2} \\
&= 5 \sqrt{5,457 - 1,510} \\
&= 5 \sqrt{3,947} \\
&= 1,9867058162 \\
&= 5 \times 1,9867058162 \\
&= 9,9
\end{aligned}$$

**b) Standard Error**

$$\begin{aligned}
SEM_3 &= \frac{SD_1}{\sqrt{N_1 - 1}} \\
&= \frac{9,9}{\sqrt{35 - 1}} \\
&= \frac{9,9}{\sqrt{34}} \\
&= \frac{9,9}{5,83} \\
&= 1,6
\end{aligned}$$

The result of calculation showed the standard deviation of pre test score of experiment was 6,16 and the standard error of pre test score of experiment group was 1,6.

The writer also calculated the data calculation of post test score of experimental group using SPSS 16 program. The result of statistic table is as follows:

**Table 4.15**

**The Table of Calculation of Mean, Standard Deviation, and Standard Error of Mean of Post-Test Score in Experimental Group Using SPSS 16 Programs**

Statistics		
VAR00001		
N	Valid	35
	Missing	0
Mean		70.8857
Std. Error of Mean		1.46027
Median		70.0000
Std. Deviation		8.63907
Range		31.00
Minimum		56.00
Maximum		87.00

The table showed the result of mean calculation was 70,9. The result of standard deviation was 8,63 and the result of standard error of mean calculation was 1,5.

**b. Distribution of Post Test Scores of the Control Group**

The post test scores of the control group were presented in the following table:



**Table 4.16**

**The Description of Post Test Scores of the Data Achieved by the Students in  
Control Group**

<b>Student's Code</b>	<b>Score</b>
C01	70
C02	70
C03	70
C04	65
C05	67
C06	60
C07	65
C08	60
C09	60
C10	41
C11	70
C12	45
C13	67
C14	58
C15	60
C16	54
C17	70
C18	58
C19	48
C20	53
C21	59
C22	58

C23	70
C24	57
C25	53
C26	70
C27	56
C28	70
C29	64
C30	52
C31	68
C32	70
C33	41
C34	55
C35	41

Based on the data above, it can be seen that the students' highest score was 70 and the student's lowest score was 41. To determine the range of score, the class interval, and interval of temporary, the writer calculated using formula as follows:

$$\text{The Highest Score (H)} = 70$$

$$\text{The Lowest Score (L)} = 41$$

$$\begin{aligned} \text{The Range of Score (R)} &= H - L + 1 \\ &= 70 - 41 + 1 \\ &= 30 \end{aligned}$$

$$\begin{aligned} \text{The Class Interval (K)} &= 1 + (3.3) \times \text{Log } n \\ &= 1 + (3.3) \times \text{Log } 35 \end{aligned}$$

$$= 1 + (3.3) \times 1,5440680444$$

$$= 6,095$$

$$= 6$$

$$\text{Interval of Temporary (I)} = \frac{R}{K} = \frac{30}{6}$$

$$= 5$$

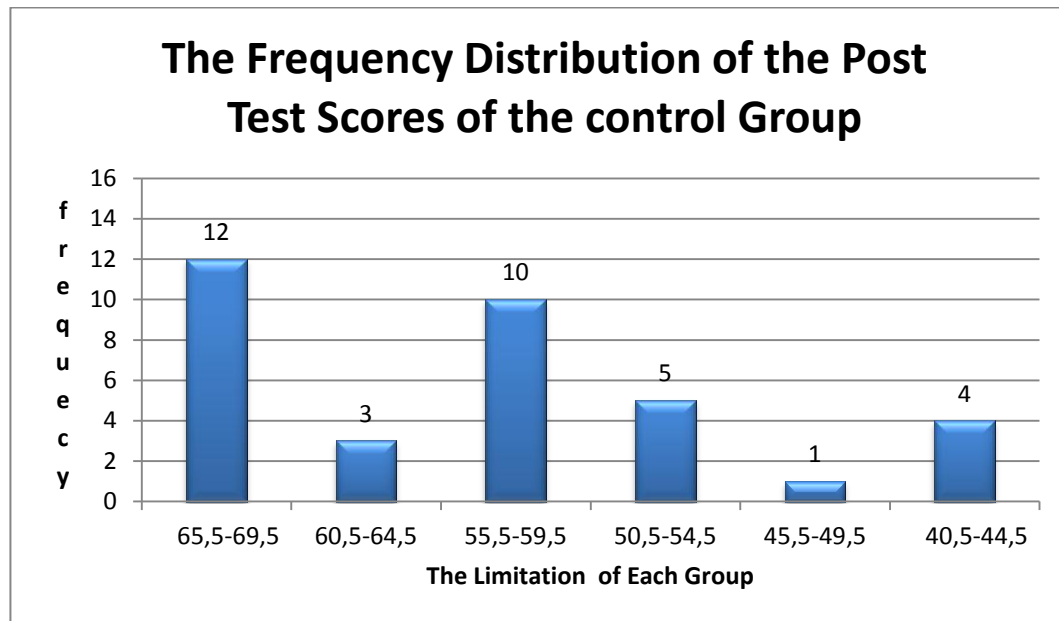
So, the range of score was 30, the class interval was 6, and interval of temporary was 5. Then, it was presented using frequency distribution in the following table:

**Table 4.17**

**Frequency Distribution of the Pos-Test Score of the Control Group**

<b>Class (k)</b>	<b>Interval (I)</b>	<b>Frequency (F)</b>	<b>Mid Point</b>	<b>The Limitation of Each Group</b>	<b>Frequency Relative (%)</b>	<b>Frequency Cumulative (%)</b>
1	66-70	12	68	65,5-69,5	34,28	100
2	61-65	3	63	60,5-64,5	8,56	65,72
3	56-60	10	58	55,5-59,5	28,55	57,16
4	51-55	5	53	50,5-54,5	14,28	28,61
5	46-50	1	48	45,5-49,5	2,9	14,33
6	41-45	4	43	40,5-44,5	11,43	11,43
<b>Total</b>		$\Sigma F = 35$			<b>100</b>	

**Figure 4.4**  
**The Frequency Distribution of the Post Test Scores of the**  
**Control Group**



It can be seen from the figure above, the students' pretest scores in experimental group. There were twelve students who got score 65,5-69,5. There were three students who got score 60,5-64,5. There were ten students who got score 55,5-59,5. There were five students who got score 50,5-54,5. There were one students who got score 45,5-49,5. And there was four student who got score 40,5-44,5.

**Table 4.18**  
**The Calculating Mean of Post-test Score of the Control Group**

Interval (I)	Frequency (F)	Mid Point (X)	FX	Fkb	Fka
66-70	12	68	816	35	10
61-65	3	63	189	32	13
56-60	10	58	580	29	23

<b>51-55</b>	<b>5</b>	<b>53</b>	265	19	28
<b>46-50</b>	<b>1</b>	<b>48</b>	48	14	29
<b>41-45</b>	<b>4</b>	<b>43</b>	172	13	30
	$\Sigma F = 35$		$\Sigma Fx = 2.070$		

**a) Mean**

$$\begin{aligned}
 M_x &= \frac{\sum fX}{N} \\
 &= \frac{2.070}{35} \\
 &= 59
 \end{aligned}$$

**b) Median**

$$\begin{aligned}
 \text{Mdn} &= l + \frac{\frac{1}{2}N - f_{k_b}}{f_i} \times i \\
 &= 55,5 + \frac{17,5 - 14}{5} \times 5 \\
 &= 55,5 + 3,5 \\
 &= 59
 \end{aligned}$$

**c) Modus**

$$\begin{aligned}
 \text{Mo} &= l + \left( \frac{f_a}{f_a + f_b} \right) \times i \\
 &= 55,5 + \left( \frac{19}{10 + 4} \right) \times 5 \\
 &= 55,5 + \left( \frac{19}{14} \right) \times 5 \\
 &= 55,5 + 6,79 \\
 &= 62
 \end{aligned}$$

The calculation above showed of mean value was 59 , median value was 59 , and modus value was 62 of the pos test of the control group.

The last step, the writer tabulated the scores of pos test of control group into the table for the calculation of standard deviation and the standard error as follows:

**Table 4.19**

**The Calculation of the Standard Deviation and the Standard Error of the Post Test Scores of control Group**

Interval (I)	Frequency (F)	Mid Point (X)	x'	Fx'	x' <sup>2</sup>	Fx' <sup>2</sup>
66-70	12	68	3	36	9	72
61-65	3	63	2	6	4	36
56-60	10	58	1	10	1	100
51-55	5	53	0	0	0	0
46-50	1	48	-1	-1	1	1
41-45	4	43	-2	-8	4	64
	$\Sigma F = 35$			$\Sigma Fx' = 61$		$\Sigma Fx'^2 = 273$

**a) Standard Deviation**

$$SD_4 = i \sqrt{\frac{\sum Fx'^2}{N} - \left(\frac{\sum Fx'}{N}\right)^2}$$

$$SD_4 = 5 \sqrt{\frac{273}{35} - \left(\frac{61}{35}\right)^2}$$

$$SD_4 = 5 \sqrt{7,8 - (1,743)^2}$$

$$SD4 = 5\sqrt{7,8 - 3,038}$$

$$SD4 = 5\sqrt{4,762}$$

$$SD4 = 2,1822 = 2,1$$

$$SD4 = 5 \times 2,1$$

$$SD4 = 10$$

**b) Standard Error**

$$SEM4 = \frac{SD_2}{\sqrt{N_1 - 1}}$$

$$SEM4 = \frac{10}{\sqrt{35 - 1}}$$

$$SEM4 = \frac{10}{\sqrt{34}}$$

$$SEM4 = \frac{10}{5,8}$$

$$SEM4 = 1,7$$

The result of calculation showed the standard deviation of post-test score of control group was 10 and the standard error of pos test score of control group was 1,7.

The writer also calculated the data calculation of post test score of experimental group using SPSS 16 program. The result of statistic table is as follows:

**Table 4.20**

**The Table of Calculation of Mean, Standard Deviation, and Standard Error of control Group Using SPSS 16 Program**

Statistics		
VAR00001		
N	Valid	35
	Missing	0
Mean		59.8571
Std. Error of Mean		1.54493
Median		60.0000
Std. Deviation		9.13990
Range		29.00
Minimum		41.00
Maximum		70.00

The table showed the result of mean calculation was 59,9. The result of standard deviation was 9,1 and the result of standard error of mean calculation was 1,5.

### **3. Testing the Normality and the Homogeneity**

The writer was calculated the result of pre-test and post-test score of experiment and control group by using SPSS 16 programs. The criteria of the normality test of score is the value of  $r$  (probability value/ critical value) is the higher than or equal to the level of significance alpha defined ( $r \geq \alpha$ ), it means that



the distribution is normal.<sup>1</sup> Then, the homogeneity is used to know the data were homogeneity or not.

**a. The Normality of Post Test Score in Experiment and Control Group**

**Table 4.21**

**The Test Normality of Posttest Score**

GROUP		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
SCORE	X1	.146	35	.058	.930	35	.028
	X2	.134	35	.117	.897	35	.013

From the table of Kolmogorov-Smirnov, the writer concluded that the significance of experiment group was 0.028 and the significance of control group was 0,003. It was higher than the significance 0,058. Thus, the distribution of the data was said to be in normal distribution.

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<sup>1</sup>Budi Susetyo, M.Pd. , *Statiska untuk Analisis Data Penelitian Dilengkapi Cara Perhitungan dengan SPSS dan MS Word Exell*, Bandung: PT. Refika Aditama, p,145

**b. Testing of Homogeneity of Posttest Score of Experiment and Control Group.**

**Table 4.22**

**Test of Homogeneity**

**Test of Homogeneity of Variance**

	Levene Statistic	df1	df2	Sig.
SCORE Based on Mean	.252	1	68	.617
Based on Median	.377	1	68	.541
Based on Median and with adjusted df	.377	1	67.789	.541
Based on trimmed mean	.302	1	68	.585

Based on the table above, the result of the analysis using SPSS program showed that the Levene Statistic was 252, the df1 was 1 and df2 was 68 and the value of significance (sig.) was 0.617. The writer concluded that the homogeneity of posttest score of experimental and control group was accepted because the value of significance (sig. 0,617) was higher than significance level (sig. 0,05). Thus, it was said that the data were homogeneous.

**B. Result of Data Analysis**

**1. Testing Hypothesis Using Manual Calculation**

The writer chose the significance level on 5%, it means the significance level of refusal of null Hypothesis on 5%. The writer decided the significance

level at 5% due to the Hypothesis type stated on non-directional (two-tailed test). It meant that the Hypothesis cannot direct the prediction of alternative Hypothesis.

To test the hypothesis of the study, the writer used t-test statistical calculation. Firstly, the writer calculated the standard deviation and the error of  $X_1$  and  $X_2$ . It was found the Standard deviation and the Standard error of post test of  $X_1$  and  $X_2$  at the previous data presentation. It could be seen on this following table:

**Table 4.23**

**The Standard Deviation and Standard Error of  $X_1$  and  $X_2$**

Variable	The Standard Deviation	The Standard Error
X1	9,9	1,6
X2	10	1,7

Where:

**X1 : Experimental Group**

**X2 : Control Group**

The table showed the result of the standard deviation calculation of  $X_1$  was 9,9 and the result of the standard error mean calculation was 1,6. The result of the standard deviation calculation of  $X_2$  was 10 and the result of the standard error mean calculation was 1.7.

The next step, the writer calculated the standard error of the differences mean between  $X_1$  and  $X_2$  as follows:

Standard Error of Mean of Score Difference between Variable I and Variable II:

$$SE_{M1} - SE_{M2} = \sqrt{SE_{M1}^2 + SE_{M2}^2}$$

$$SE_{M1} - SE_{M2} = \sqrt{1,34^2 + 1,77^2}$$

$$SE_{M1} - SE_{M2} = \sqrt{1,7956 + 3,1329}$$

$$SE_{M1} - SE_{M2} = \sqrt{4,9285}$$

$$SE_{M1} - SE_{M2} = 2,22$$

$$SE_{M1} - SE_{M2} = 2,22$$

The calculation above showed the standard error of the differences mean between  $X_1$  and  $X_2$  was 2,22. Then, it was inserted to the  $t_o$  formula to get the value of  $t$  observe as follows:

$$t_o = \frac{M1 - M2}{SE_{M1} - SE_{M2}}$$

$$t_o = \frac{71 - 59}{2,22}$$

$$t_o = \frac{12}{2,22}$$

$$t_o = 5,405$$

With the criteria:

If  $t\text{-test (t-observed)} \geq t\text{-table}$ ,  $H_a$  is accepted and  $H_o$  is rejected.

If  $t\text{-test (t-observed)} < t\text{-table}$ ,  $H_a$  is rejected and  $H_o$  is accepted.

Then, the writer interpreted the result of  $t$ -test. Previously, the writer accounted the degree of freedom (df) with the formula:

$$df = (N_1 + N_2) - 2$$

$$= (35 + 35) - 2 = 68$$

$t_{\text{table}}$  at df 68 at 5% significant level = 2.650

The writer chose the significant levels on 5%; it means the significant level of refusal of null hypothesis on 5%. The writer decided the significance level at 5% due to the hypothesis typed stated on non-directional (two-tailed test). It meant that the hypothesis can't direct the prediction of alternative hypothesis.

The calculation above showed the result of t-test calculation as in the table follows:

**Table 4.24**

**The Result of T-test**

Variable	T observed	T table		Df/db
		5%	1%	
$X_1-X_2$	5,405	2.650	3,214	68

Where:

$X_1$  = Experimental Group

$X_2$  = Control Group

T observe = The Calculated Value

T table = The Distribution of t value

Df/db = Degree of Freedom

Based on the result of hypothesis test calculation, it was found that the value of  $t_{\text{observed}}$  was greater than the value of  $t_{\text{table}}$  at significance level or  $2.650 < 5,405 > 3,214$ . It meant  $H_a$  was accepted and  $H_o$  was rejected.

It could be interpreted based on the result of calculation that  $H_a$  stating the students taught by using Total Physical Response have better vocabulary size than

those taught using Direct Method was accepted and  $H_0$  stating that the students taught by Total Physical Response do not have better vocabulary size than those taught using Direct Method was rejected. Therefore teaching using Total Physical Response gave significant effect on the student's vocabulary size of the student's seventh grade of MTs Muslimat NU Palangka Raya.

## 2. Testing Hypothesis Using SPSS Program

The writer also applied SPSS 16 program to calculate t test in testing hypothesis of the study. The result of t test using SPSS 16 was used to support the manual calculation of the t test. The result of the t test using SPSS 16 program could be seen as follows:

**Table 4.25**

### **The Standard Deviation and the Standard Error of $X_1$ and $X_2$**

	Group	N	Mean	Std. Deviation	Std. Error Mean
Score	X1	35	70,8857	8,63907	1,46027
	X2	35	59,8571	9,13990	1,54493

The table showed the result of the standard deviation calculation of  $X_1$  was 8,639 and the result of the standard error mean calculation was 1,46. The result of the standard deviation calculation of  $X_2$  was 9,13 and the standard error mean calculation was 1,54.

Table 4.26

## The Calculation T-test Using SPSS 16 program Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Score	Equal variances assumed	,252	,617	5,405	68	0,541	11,02857	2,12584	6,78653	15,27061
	Equal variances not assumed			5,405	67,785	0,541	11,02857	2,12584	6,78629	15,27086

Based on the result of t-value using SPSS 16 program. Since the result of post test between experimental and control group had difference score of variance, it found that the result of t observed was 5,405, the result of mean difference between experimental and control group was 11,02857.

To examine the truth or the null hypothesis stating that there is no significant difference between students' vocabulary using Total Physical Response and without Total Physical Response in vocabulary size at seventh grade MTs Muslimat NU Palangka Raya was rejected, the result of post test was interpreted on the result of degree freedom to get t *table*. The result of degree

freedom (df) was 68. The following table was the result of *t observed* and *t table* from 68 df at 5% and 1 % significance level.

**Table 4.27**

**The Result of T-test**

Variable	t observe	t table		Df/db
		5%	1%	
$X_1 - X_2$	5,405	2.650	<b>3,214</b>	68

Where:

$X_1$  = Experimental Group

$X_2$  = Control Group

T observe = the Calculated Value

T table = The Distribution of t value

Df/db = Degree of Freedom

**C. Discussion**

The result of the analysis shows that Total Physical Response gives significant effect to the students' vocabulary size. It could be proved from the students' score; the students taught using Total Physical Response reached higher score than those taught without Total Physical Response Method. It was found the mean of experiment group score ( $X_1$ ) was 71 and the mean of control group score ( $X_2$ ) was 59. Then, those results were compared using T-test and it was found  $t_{observed}$  computation using manual was 5,405 and  $t_{table}$  was 2,650. It meant, from the computation was found  $t_{observed} > t_{table}$ .



To support the result of testing hypothesis, the writer also calculated the hypothesis using SPSS 16 program. The result of the analysis showed that the students who are taught by using Total Physical Response method gave significant effect on the students' vocabulary size. It is proved by the value of  $t_{\text{observed}}$  that was higher than  $t_{\text{table}}$ , either at 5% significance level or at 1% significance level ( $2,650 < 5,405 < 2,314$ ).

Those statistical findings were suitable with the theories as mentioned before. Total Physical Response method do promote language learning for they not only aid pronunciation, make vocabulary and structures memorable but also bring variety and fun to the language learning classroom

A method or technique in teaching and learning process must be developed in order to get a better purpose for a better life. TPR was developed in order to improve the better result of teaching learning process of a new language. Teachers who use TPR believe in the importance of having the students enjoy their experience in learning to communicate a foreign language.

According to Larsen-Freeman, TPR was develop in order to reduce the stress people feel when studying foreign language and thereby encourage students to persist in their study beyond a beginning level of proficiency.<sup>2</sup>

These findings were suitable with the theories as stated in chapter II. The first, Total Physical Response method was an interesting technique for the students because it was a completely technique for the students at MTs Muslimat

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<sup>2</sup>Diane Larsen, Freeman, *Technique and Principles in Language Teaching, second Edition* (Hongkong: oxford University Press, 2000), p. 113

NU Palangka Raya It was shows from the students' response that they were very enjoy in classroom.

Second, vocabulary size was the important one in learning English. It was the obligation of this school. It could help the students to vocabulary size. It also made the students aware of materials that were not essential to the students' memorizing to be deleted. So, Total Physical response method are suitable for all students no matter what age they are and what level of English, learning strategies, intelligence, interests or learning problems they have.

There are reasons why Total Physical Response gives effect on the students' vocabulary seventh grade students at MTs Muslimat NU Palangka Raya. First, using Total Physical Response, the students could easy and fun to memories words or vocabulary. Students get greatly motivated by using word in the foreign language classroom. TPR Method creates an atmosphere of interest in the study of English and can lead from a "teacher centered" to a "student centered" class". So, Students become themselves when they want to speak in the class.

And the last one problem, which TPR method has related its special reliance on action (Physical Response). For social reason, many adults and children, feel embarrassed marching around a room to do the teacher's comments. For that, the teacher is demanded to be creative. In the other hand, while the required action could be modified to lesson. So, there is not much else a teacher can do to remedy this situation. Adult become more accepting in time, especially after they see their teacher doing the same things that have to do.

Based on the evidence above, it could be concluded that the idea development quality of students' vocabulary size was better by using total physical response.