CHAPTER IV

THE RESULT OF THE STUDY

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

A. Data Presentation

The writer presented the data obtained in the calculation of mean, median, modus, standard deviation and standard error in the figures and in the tables. For the first step, the writer tabulated the score into the frequency distribution table.

1. Distribution of Pre Test Scores of the Experiment Group

The pre test of the experimental group was held on Saturday, August 24th, 2013 period 09.00-10.10 which followed by 32 students. The time allocation of pre test was 70 minutes. The total items of the pre test was 20 items. In this test, the writer asked the students to arrange the jumbled letters. The pre test scores of the 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

No	Students' Code	Score
1	E01	40
2	E02	55
3	E03	65
4	E04	45
5	E05	50
6	E06	60
7	E07	40
8	E08	55
9	E09	70

10	E10	60
11	E11	50
12	E12	35
13	E13	40
14	E14	60
15	E15	50
16	E16	45
17	E17	45
18	E18	65
19	E19	55
20	E20	75
21	E21	50
22	E22	35
23	E23	40
24	E24	45
25	E25	50
26	E26	55
27	E27	55
28	E28	50
29	E29	60
30	E30	45
31	E31	35
32	E32	60
Total		**1640**

Based on the data above, it was known the highest score was 75 and the lowest score was 35. To determine the range of score, the class interval, and interval temporary, the writer calculated using formula as follows:

The Highest Score (H) = 76
The Lowest Score (L) = 36
The Range of Score (R) = H – L + 1
= 75 – 35 + 1
= 41

The Class Interval (K) = 1 + (3,3) x Log n
= 1 + (3,3) x Log 32
= 1 + (3,3) x 1,505149978
= 1 + 4,966994928
= 5,966994928
= 6

Interval of Temporary (I) $= \frac{R}{K} = \frac{41}{6}$

$= 6{,}83$

$= 7$

So, the range of score was 41, the class interval was 6, and interval of temporary was 7. Then, it was presented using frequency distribution in the following table:

Table 4.2 The Frequency Distribution of the Pre Test Scores of the Experimental Group

Class (K)	Interval (I)	Frequency (f)	Midpoint (X)	The Limitation of Each Group	Relative Frequency (%)	Cumulative Frequency (%)
1	70 - 76	2	73	69.5 – 76.5	6.25	100
2	63 - 69	2	66	62.5 – 69.5	6.25	93.75
3	56 - 62	5	59	55.5 – 62.5	15.625	87.5
4	49 - 55	11	52	48.5 – 55.5	34.375	71.875
5	42 - 48	5	45	41.5 – 48.5	15.625	37.5
6	35 - 41	7	38	34.5 – 41.5	21.875	21.875
		F = 32			**P = 100**	

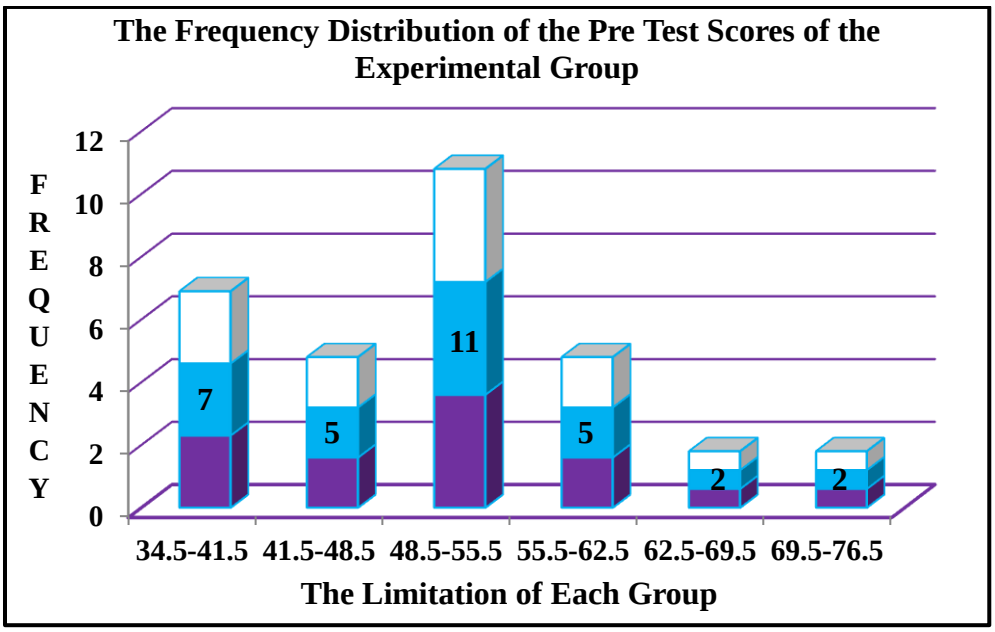

Figure 4.1 The Histogram of Frequency Distribution of the Pre Test Scores of the Experimental Group

The table and figure above showed the pre test score of the students in the control group. It could be seen that there were 7 students who got score 34.5–41.5. There were 5 students who got score 41.5–48.5. There were 11 students who got score 48.5–55.5. There were 5 students who got score 55.5–62.5. There were 2 students who got score 62,5–69,5. There were 2 students who got score 69.5–76.5.

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

Interval	f	X	fX	fk (b)	fk (a)
70 - 76	2	73	146	32	2
63 - 69	2	66	132	30	4
56 - 62	5	59	295	28	9
49 - 55	11	52	572	23	20
42 - 48	5	45	225	12	25
35 - 41	7	38	266	7	32
	∑F = 32		**∑fX = 1636**		

a. Mean

$$\text{Mx} = \frac{\sum fx}{N}$$

$$= \frac{1636}{32}$$

$$= 51{,}125$$

b. Median

$$\text{Mdn} = \ell + \frac{\frac{1}{2}N - fk_b}{f_i} \text{ x } i$$

$$= 48{,}5 + \frac{16 - 12}{11} \text{ x } 7$$

$$= 48{,}5 + \frac{4}{11} \text{ x } 7$$

$$= 48{,}5 + 2{,}54$$

$$= 51{,}045$$

c. Modus

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

$$= 48{,}5 + \left(\frac{5}{5 + 5}\right) \text{x } 7$$

$$= 48{,}5 + \frac{5}{10} \text{ x } 7$$

$$= 48{,}5 + 3{,}5$$

$$= 52$$

The calculation above showed of mean value was 51.125, median value was 51.045 and modus value was 52 of the pre test of the experimental group. The last step, the writer tabulated the scores of pre test of experimental group into the table for the calculation of the standard deviation and the standard error as follows:

Table 4.4 The Calculation of Standard Deviation and Standard Error of the Pre Test Scores of the Experimental Group

Interval	f	X	x'	fx'	x'^2	fx'^2
70 - 76	2	73	3	6	9	18
63 - 69	2	66	2	4	4	8
56 - 62	5	59	1	5	1	5
49 - 55	11	52	0	0	0	0
42 - 48	5	45	-1	-5	1	5
35 - 41	7	38	-2	-14	4	28
	$\sum$F = 32			**$\sum$ fx' = -4**		**$\sum$ fx'^2 = 64**

a. Standard Deviation

$$SD_1 = i\sqrt{\frac{\sum fx'^2}{N} - \left(\frac{\sum fx'}{N}\right)^2}$$

$$= 7\sqrt{\frac{64}{32} - \left(\frac{-4}{32}\right)^2}$$

$$= 7\sqrt{2 - (-0{,}125)^2}$$

$$= 7\sqrt{2 - 0{,}015625}$$

$$= 7\sqrt{1{,}984375}$$

$$= 7 \text{ x } 1{,}408678459$$

$$= 9{,}860749211$$

$$= 9{,}86$$

b. Standard Error

$$SEM_1 = \frac{SD_1}{\sqrt{N-1}}$$

$$= \frac{9{,}860749211}{\sqrt{32-1}}$$

$$= \frac{9{,}860749211}{\sqrt{31}}$$

$$= \frac{9{,}860749211}{5{,}567764363}$$

$$= 1{,}77104284$$

$$= 1{,}77$$

The result of calculation showed the standard deviation of pre test score of experimental group was 9.86 and the standard error of pre test score of experimental group was 1.77.

2. Distribution of Pre Test Scores of the Control Group

The pre test of the control group was held on Monday, August 12th, 2013 period 09.00-10.10 which followed by 32 students. The time allocation of pre test was 70 minutes. The total items of the pre test was 20 items. In this test, the writer asked the students to arrange the jumbled letters. The pre test scores of the control group were presented in the following table:

Table 4.5 The Description of Pre Test Scores of the Data Achieved by the Students in Control Group

No	Students' Code	Score
1	C01	60
2	C02	40
3	C03	35
4	C04	70
5	C05	50
6	C06	45
7	C07	60
8	C08	55
9	C09	40
10	C10	65
11	C11	50
12	C12	70
13	C13	45
14	C14	35
15	C15	55
16	C16	60
17	C17	50
18	C18	40
19	C19	45
20	C20	60
21	C21	50
22	C22	55
23	C23	45
24	C24	45
25	C25	65
26	C26	55

27	C27	35
28	C28	45
29	C29	50
30	C30	75
31	C31	40
32	C32	55
Total		**1645**

Based on the data above, it was known the highest score was 75 and the lowest score was 35. To determine the range of score, the class interval, and interval temporary, the writer calculated using formula as follows:

The Highest Score (H) = 76

The Lowest Score (L) = 36

The Range of Score (R) = H – L + 1

= 75 – 35 + 1

= 41

The Class Interval (K) = 1 + (3,3) x Log n

= 1 + (3,3) x Log 32

= 1 + (3,3) x 1,505149978

= 1 + 4,966994928

= 5,966994928

= 6

Interval of Temporary (I) = $\frac{R}{K} = \frac{41}{6}$

= 6,83

= 7

So, the range of score was 41, the class interval was 6, and interval of temporary was 7. Then, it was presented using frequency distribution in the following table:

Table 4.6 The Frequency Distribution of the Pre Test Scores of the Control Group

Class (K)	Interval (I)	Frequency (f)	Midpoint (X)	The Limitation of Each Group	Relative Frequency (%)	Cumulative Frequency (%)
1	70 - 76	3	73	69.5 – 76.5	9.375	100
2	63 - 69	2	66	62.5 – 69.5	6.25	90.625
3	56 - 62	4	59	55.5 – 62.5	12.5	84.375
4	49 - 55	10	52	48.5 – 55.5	31.25	71.875
5	42 - 48	6	45	41.5 – 48.5	18.75	40.625
6	35 - 41	7	38	34.5 – 41.5	21.875	21.875
		F = 32			**P = 100**	

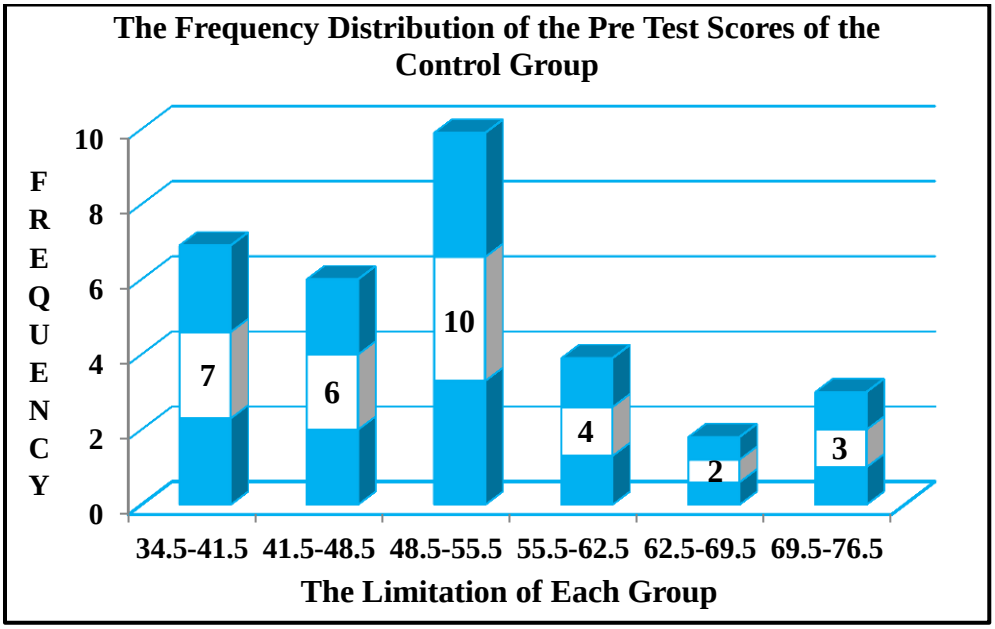

Figure 4.2 The Histogram of Frequency Distribution of the Pre Test Scores of the Control Group

The table and figure above showed the pre test score of the students in the control group. It could be seen that there were 7 students who got score 34.5–41.5. There were 6 students who got score 41.5–48.5. There were 10 students who got score 48.5–55.5. There were 4 students who got score 55.5–62.5. There were 2 students who got score 62.5–69.5. There were 3 students who got score 69.5–76.5.

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

Table 4.7 The Calculation of Mean, Median, and Modus of the Pre Test Scores of the Control Group

Interval	f	X	fX	fk (b)	fk (a)
70 - 76	3	73	219	32	3
63 - 69	2	66	132	29	5
56 - 62	4	59	236	27	9
49 - 55	10	52	520	23	19
42 - 48	6	45	270	13	25
35 - 41	7	38	266	7	32
	∑F = 32		**∑fX = 1643**		

a. Mean

$$\text{Mx} = \frac{\sum fx}{N}$$

$$= \frac{1643}{32}$$

$$= 51{,}34$$

b. Median

$$\text{Mdn} = \ell + \frac{\frac{1}{2}N - fk_b}{f_i} \text{ x } i$$

$$= 48{,}5 + \frac{16 - 13}{10} \text{ x } 7$$

$$= 48{,}5 + \frac{3}{10} \text{ x } 7$$

$$= 48{,}5 + 2{,}1$$

$$= 50{,}6$$

c. Modus

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

$$= 48{,}5 + \left(\frac{4}{4 + 6}\right) \text{x } 7$$

$$= 48{,}5 + \frac{4}{10} \text{ x } 7$$
$$= 48{,}5 + 2{,}8$$
$$= 51{,}3$$

The calculation above showed of mean value was 51.34, median value was 50.6, and modus value was 51.3 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 the standard deviation and the standard error as follows:

Table 4.8 The Calculation of Standard Deviation and Standard Error of the Pre Test Scores of the Experimental Group

Interval	f	X	x'	fx'	x'^2	fx'^2
70 - 76	3	73	3	9	9	27
63 - 69	2	66	2	4	4	8
56 - 62	4	59	1	4	1	4
49 - 55	10	52	0	0	0	0
42 - 48	6	45	-1	-6	1	6
35 - 41	7	38	-2	-14	4	28
	∑F = 32			**∑ fx' = -3**		**∑ fx'^2 = 73**

a. Standard Deviation

$$SD_1 = i\sqrt{\frac{\sum fx'^2}{N} - \left(\frac{\sum fx'}{N}\right)^2}$$
$$= 7\sqrt{\frac{73}{32} - \left(\frac{-3}{32}\right)^2}$$
$$= 7\sqrt{2{,}28125 - (-0{,}09375)^2}$$
$$= 7\sqrt{2{,}28125 - 0{,}008789062}$$
$$= 7\sqrt{2{,}272460938}$$
$$= 7 \text{ x } 1{,}507468387$$
$$= 10{,}55227871$$
$$= 10{,}55$$

b. Standard Error

$$SEM_1 = \frac{SD_1}{\sqrt{N-1}}$$
$$= \frac{10{,}55227871}{\sqrt{32-1}}$$
$$= \frac{10{,}55227871}{\sqrt{31}}$$
$$= \frac{10{,}55227871}{5{,}567764363}$$
$$= 1{,}895245205$$
$$= 1{,}89$$

The result of calculation showed the standard deviation of pre test score of control group was 10.55 and the standard error of pre test score of control group was 1.89.

3. Distribution of Post Test Scores of the Experiment Group

The post test of the experimental group was held on Saturday, September 28th, 2013 period 09.00-10.10 which followed by 32 students. The time allocation of post test was 70 minutes. The total items of the post test was 20 items. In this test, the writer asked the students to arrange the jumbled letters. The post test scores of the experimental group were presented in the following table:

Table 4.9 The Description of Post Test Scores of the Data Achieved by the Students in Experimental Group

No	Students' Code	Score
1	E01	70
2	E02	85
3	E03	65
4	E04	75
5	E05	80
6	E06	80
7	E07	65
8	E08	90
9	E09	75

10	E10	55
11	E11	95
12	E12	80
13	E13	70
14	E14	90
15	E15	75
16	E16	65
17	E17	80
18	E18	90
19	E19	70
20	E20	85
21	E21	75
22	E22	60
23	E23	90
24	E24	80
25	E25	85
26	E26	70
27	E27	95
28	E28	75
29	E29	65
30	E30	85
31	E31	80
32	E32	75
Total		**2475**

Based on the data above, it was known the highest score was 95 and the lowest score was 55. To determine the range of score, the class interval, and interval temporary, the writer calculated using formula as follows:

The Highest Score (H) = 96
The Lowest Score (L) = 48
The Range of Score (R) = H – L + 1
= 95 – 55 + 1
= 41

The Class Interval (K) = 1 + (3,3) x Log n
= 1 + (3,3) x Log 32
= 1 + (3,3) x 1,505149978
= 1 + 4,966994928
= 5,966994928
= 6

Interval of Temporary (I) $= \frac{R}{K} = \frac{41}{6}$

$= 6{,}83$

$= 7$

So, the range of score was 41, the class interval was 6, and interval of temporary was 7. Then, it was presented using frequency distribution in the following table:

Table 4.10 The Frequency Distribution of Post Test Scores of the Experimental Group

Class (K)	Interval (I)	Frequency (f)	Midpoint (X)	The Limitation of Each Group	Relative Frequency (%)	Cumulative Frequency (%)
1	90-96	6	93	89.5 – 96.5	18.75	100
2	83-89	4	86	82.5 – 89.5	12.5	81.25
3	76-82	6	79	75.5 – 82.5	18.75	68.75
4	69-75	10	72	68.5 – 75.5	31.25	50
5	62-68	4	65	61.5 – 68.5	12.5	18.75
6	55-61	2	58	54.5 – 61.5	6.25	6.25
		F = 32			**P = 100**	

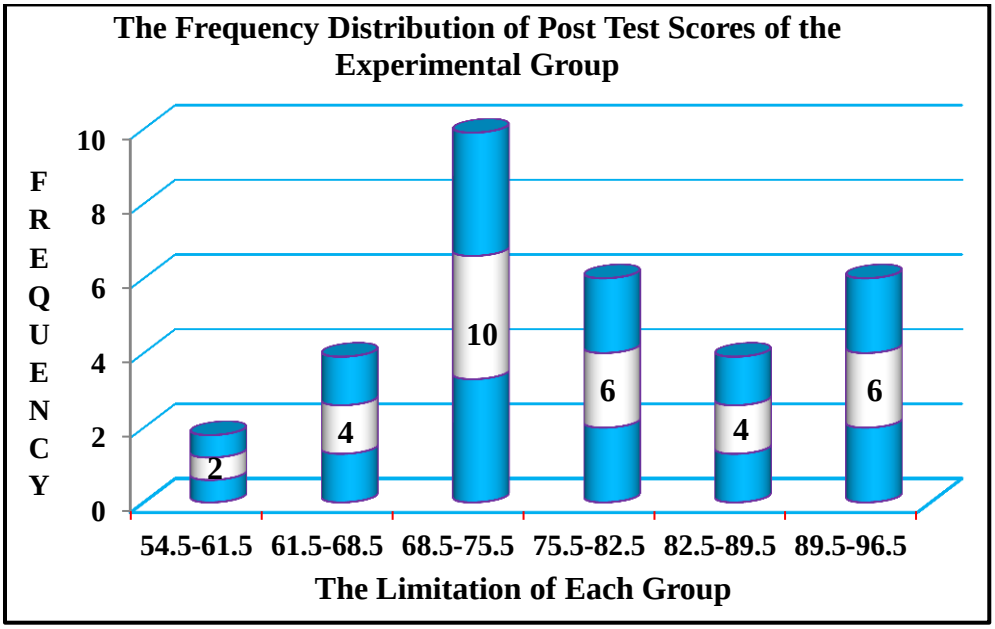

Figure 4.3 The Histogram of Frequency Distribution of Post Test Scores of the Experimental Group

The table and figure above showed the post test score of the students in the experimental group. It could be seen that there were 2 students who got score 54.5–61.5. There were 4 students who got score 61.5–68.5. There were 10 students who got score 68.5–75.5. There were 6 students who got score 75.5–82.5. There were 4 students who got score 82.5–89.5. There were 6 students who got score 89.5–96.5.

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

Table 4.11 The Calculation of Mean, Median, and Modus of Post Test Scores of the Experimental Group

Interval	f	X	fX	fk (b)	fk (a)
90-96	6	93	558	32	6
83-89	4	86	344	26	10
76-82	6	79	474	22	16
69-75	10	72	720	16	26
62-68	4	65	260	6	30
55-61	2	58	116	2	32
	∑F = 32		**∑fX = 2472**		

a. Mean

$$\text{Mx} = \frac{\sum fx}{N}$$

$$= \frac{2472}{32}$$

$$= 77{,}25$$

b. Median

$$\text{Mdn} = \ell + \frac{\frac{1}{2}N - fk_b}{f_i} \text{ x } i$$

$$= 68{,}5 + \frac{16 - 6}{10} \text{ x } 7$$

$$= 68{,}5 + \frac{10}{10} \text{ x } 7$$

$$= 68{,}5 + 7$$

$$= 75{,}5$$

c. Modus

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

$$= 68{,}5 + \left(\frac{6}{6 + 4}\right) \text{x } 7$$

$$= 68{,}5 + \frac{6}{10} \text{ x } 7$$

$$= 68{,}5 + 4{,}2$$

$$= 72{,}7$$

The calculation above showed of mean value was 77.25, median value was 75.5 and modus value was 72.7 of the post test of the experimental group. The last step, the writer tabulated the scores of post test of experimental group into the table for the calculation of the standard deviation and the standard error as follows:

Table 4.12 The Calculation of Standard Deviation and Standard Error of Post Test Scores of the Experimental Group

Interval	f	X	x'	fx'	x'^2	fx'^2
90-96	6	93	3	18	9	54
83-89	4	86	2	8	4	16
76-82	6	79	1	6	1	6
69-75	10	72	0	0	0	0
62-68	4	65	-1	-4	1	4
55-61	2	58	-2	-4	4	8
	$\sum F = 32$			**$\sum fx' = 24$**		**$\sum fx'^2 = 88$**

a. Standard Deviation

$$SD_1 = i\sqrt{\frac{\sum fx'^2}{N} - \left(\frac{\sum fx'}{N}\right)^2}$$

$$= 7\sqrt{\frac{88}{32} - \left(\frac{24}{32}\right)^2}$$

$$= 7\sqrt{2{,}75 - (0{,}75)^2}$$

$$= 7\sqrt{2{,}75 - 0{,}5625}$$

$$= 7\sqrt{2{,}1875}$$

$$= 7 \text{ x } 1{,}701946$$

$$= 10{,}35313962$$

$$= 10{,}353$$

b. Standard Error

$$SEM_1 = \frac{SD_1}{\sqrt{N-1}}$$

$$= \frac{10{,}35313962}{\sqrt{32-1}}$$

$$= \frac{10{,}35313962}{\sqrt{31}}$$

$$= \frac{10{,}35313962}{5{,}567764363}$$

$$= 1{,}859478768$$

$$= 1{,}859$$

The result of calculation showed the standard deviation of post test score of experimental group was 10.353 and the standard error of post test score of experimental group was 1.859.

The writer also calculated the data calculation of post test score of experimental group using SPSS 17.0 program. The result of the statistic table was as follows:

Table 4.13 The Frequency Distribution of Post Test Scores of the Experimental Group Using SPSS 17.0 Program

VAR00001

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	55.00	1	3.1	3.1	3.1
	60.00	1	3.1	3.1	6.3
	65.00	4	12.5	12.5	18.8
	70.00	4	12.5	12.5	31.3
	75.00	6	18.8	18.8	50.0
	80.00	6	18.8	18.8	68.8
	85.00	4	12.5	12.5	81.3
	90.00	4	12.5	12.5	93.8
	95.00	2	6.3	6.3	100.0
	Total	32	100.0	100.0	

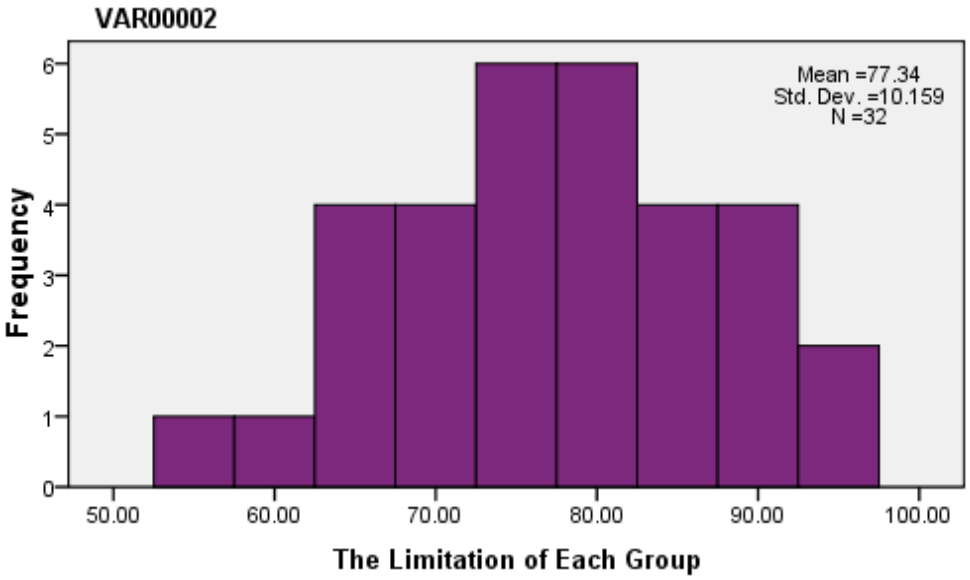

Figure 4.4 The Frequency Distribution of Post Test Scores of the Experimental Group Using SPSS 17.0 Program

The table and figure above showed the result of post test scores achieved by the control group using SPSS 17.0 program. It could be seen that there was a student got 55 (3.1%), a student got 60 (3.1%), four students got 65 (12.5%), four students got 70 (12.5%), six students got 75 (18.8%), six students got 80 (18.8%), four students got 85 (12.5%), four students got 90 (12.5%), and two students got 95 (6.3%).

The next step, the writer calculated the score of mean, median, modus, standard deviation and standard error of post test score in experimental group as follows:

Table 4.14 The Calculation of Mean, Median, Modus, Standard Deviation and Standard Error of Post Test Scores of the Experimental Group Using SPSS 17.0 Program

STATISTICS

VAR00001

N	Valid	32
	Missing	0
Mean		77.3438
Std. Error of Mean		1.79583
Median		77.5000
Mode		75.00
Std. Deviation		10.15877
Variance		103.201
Range		40.00
Minimum		55.00
Maximum		95.00
Sum		2475.00

The table showed the result of mean calculation was 77.34, the result of median calculation was 77.50, and the result of modus calculation was 75.00. The result of standard deviation calculation was 10.15 and the result of standard error of mean calculation was 1.79.

4. Distribution of Post Test Scores of the Control Group

The post test of the control group was held on Monday, September 16th, 2013 period 09.00-10.10 which followed by 32 students. The time allocation of post test was 70 minutes. The total items of the post test was 20 items. In this test, the writer asked the students to arrange the jumbled letters. The post test scores of the control group were presented in the following table:

Table 4.15 The Description of Post Test Scores of the Data Achieved by the Students in Control Group

No	Students' Code	Score
1	C01	45
2	C02	60
3	C03	70
4	C04	40
5	C05	55
6	C06	50
7	C07	60
8	C08	45
9	C09	65
10	C10	55
11	C11	45
12	C12	50
13	C13	75
14	C14	55
15	C15	55
16	C16	60
17	C17	65
18	C18	35
19	C19	50

20	C20	55
21	C21	45
22	C22	70
23	C23	55
24	C24	50
25	C25	60
26	C26	40
27	C27	55
28	C28	45
29	C29	75
30	C30	55
31	C31	45
32	C32	65
Total		**1750**

Based on the data above, it was known the highest score was 75 and the lowest score was 35. To determine the range of score, the class interval, and interval temporary, the writer calculated using formula as follows:

The Highest Score (H) = 76

The Lowest Score (L) = 36

The Range of Score (R) = H – L + 1

= 75 – 35 + 1

= 41

The Class Interval (K) = 1 + (3,3) x Log n

= 1 + (3,3) x Log 32

= 1 + (3,3) x 1,505149978

= 1 + 4,966994928

= 5,966994928

= 6

Interval of Temporary (I) = $\frac{R}{K} = \frac{41}{6}$

= 6,83

= 7

So, the range of score was 41, the class interval was 6, and interval of temporary was 7. Then, it was presented using frequency distribution in the following table:

Table 4.16 The Frequency Distribution of Post Test Scores of the Control Group

Class (K)	Interval (I)	Frequency (f)	Midpoint (X)	The Limitation of Each Group	Relative Frequency (%)	Cumulative Frequency (%)
1	70 - 76	4	73	69.5 – 76.5	12.5	100
2	63 - 69	3	66	62.5 – 69.5	9.375	87.5
3	56 - 62	4	59	55.5 – 62.5	12.5	78.125
4	49 - 55	12	52	48.5 – 55.5	37.5	65.625
5	42 - 48	6	45	41.5 – 48.5	18.75	28.125
6	35 - 41	3	38	34.5 – 41.5	9.375	9.375
		F = 32			**P = 100**	

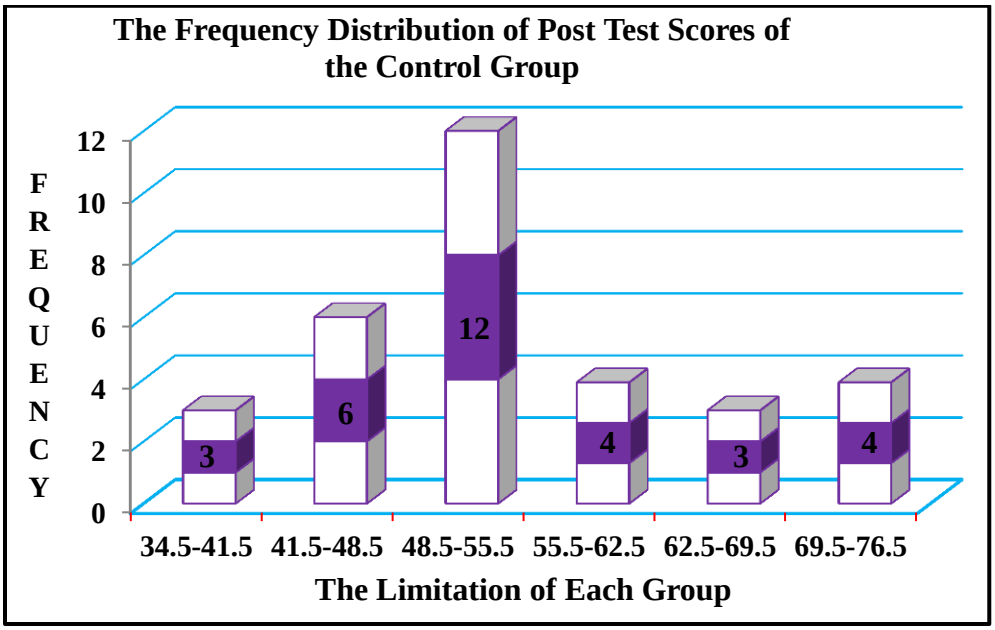

Figure 4.5 The Histogram of Frequency Distribution of Post Test Scores of the Control Group

The table and figure above showed the pre test score of the students in the control group. It could be seen that there were 3 students who got score 34.5–41.5. There were 6 students who got score

41.5–48.5. There were 12 students who got score 48.5–55.5. There were 4 students who got score 55.5–62.5. There were 3 students who got score 62.5–69.5. There were 4 students who got score 69.5–76.5.

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

Table 4.17 The Calculation of Mean, Median, and Modus of Post Test Scores of the Control Group

Interval	f	X	fX	fk (b)	fk (a)
70 - 76	4	73	292	32	4
63 - 69	3	66	198	28	7
56 - 62	4	59	236	25	11
49 - 55	12	52	624	21	23
42 - 48	6	45	270	9	29
35 - 41	3	38	114	3	32
	∑F = 32		**∑fX = 1734**		

a. Mean

$$\text{Mx} = \frac{\sum fx}{N}$$

$$= \frac{1734}{32}$$

$$= 54{,}187$$

b. Median

$$\text{Mdn} = \ell + \frac{\frac{1}{2}N - fk_b}{f_i} \text{ x } i$$

$$= 48{,}5 + \frac{16 - 9}{12} \text{ x } 7$$

$$= 48{,}5 + \frac{7}{12} \text{ x } 7$$

$$= 48{,}5 + 4{,}08$$

$$= 52{,}58$$

c. Modus

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

$$= 48{,}5 + \left(\frac{4}{4 + 6}\right) \text{x } 7$$

$$= 48{,}5 + \frac{4}{10} \text{ x } 7$$

$$= 48{,}5 + 2{,}8$$

$$= 51{,}3$$

The calculation above showed of mean value was 54.187, median value was 52.58 and modus value was 51.3 of the post test of the control group. The last step, the writer tabulated the scores of post test of control group into the table for the calculation of the standard deviation and the standard error as follows:

Table 4.18 The Calculation of Standard Deviation and Standard Error of Post Test Scores of the Control Group

Interval	f	X	x'	fx'	x'^2	fx'^2
70 - 76	4	73	3	12	9	36
63 - 69	3	66	2	6	4	12
56 - 62	4	59	1	4	1	4
49 - 55	12	52	0	0	0	0
42 - 48	6	45	-1	-6	1	6
35 - 41	3	38	-2	-6	4	12
	∑F = 32			**∑ fx' = 10**		**∑ fx'^2 = 70**

a. Standard Deviation

$$SD_1 = i\sqrt{\frac{\sum fx'^2}{N} - \left(\frac{\sum fx'}{N}\right)^2}$$

$$= 7\sqrt{\frac{70}{32} - \left(\frac{10}{32}\right)^2}$$

$$= 7\sqrt{2{,}1875 - (0{,}3125)^2}$$

$$= 7\sqrt{2{,}1875 - 0{,}09765625}$$

$$= 7\sqrt{2{,}08984375}$$

$$= 7 \text{ x } 1{,}445629188$$

$$= 10{,}11940432$$

$$= 10{,}119$$

b. Standard Error

$$\boldsymbol{SEM_1} = \frac{\boldsymbol{SD_1}}{\sqrt{\boldsymbol{N-1}}}$$

$$= \frac{10{,}11940432}{\sqrt{32-1}}$$

$$= \frac{10{,}11940432}{\sqrt{31}}$$

$$= \frac{10{,}11940432}{5{,}567764363}$$

$$= 1{,}817498669$$

$$= 1{,}817$$

The result of calculation showed the standard deviation of post test score of control group was 10.119 and the standard error of post test score of control group was 1.817.

The writer also calculated the data calculation of post test score of control group using SPSS 17.0 program. The result of the statistic table was as follows:

Table 4.19 The Frequency Distribution of Post Test Scores of the Control Group Using SPSS 17.0 Program

VAR00001

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	35.00	1	3.1	3.1	3.1
	40.00	2	6.3	6.3	9.4
	45.00	6	18.8	18.8	28.1
	50.00	4	12.5	12.5	40.6
	55.00	8	25.0	25.0	65.6
	60.00	4	12.5	12.5	78.1
	65.00	3	9.4	9.4	87.5
	70.00	2	6.3	6.3	93.8
	75.00	2	6.3	6.3	100.0
	Total	32	100.0	100.0	

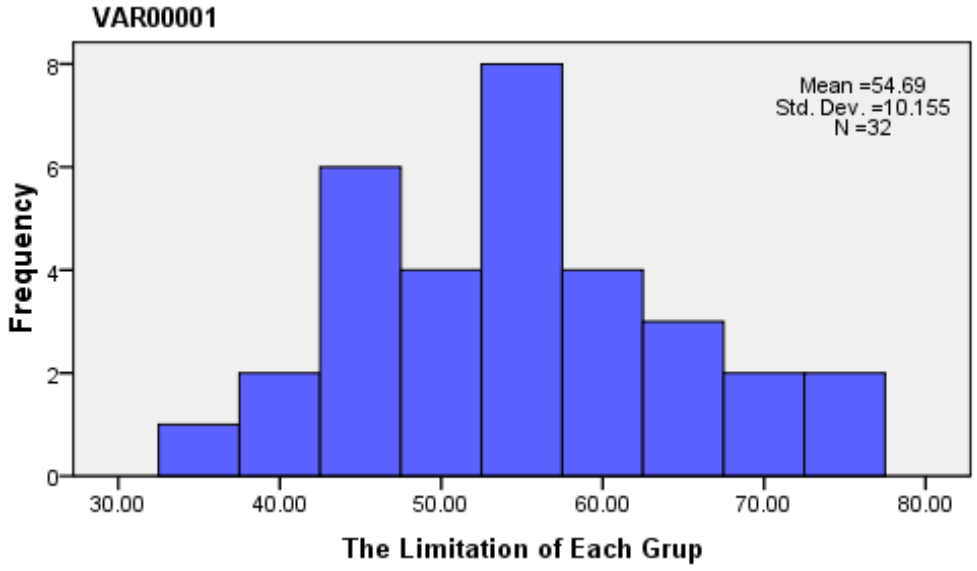

Figure 4.6 The Frequency Distribution of Post Test Scores of the Control Group Using SPSS 17.0 Program

The table and figure above showed the result of post test scores achieved by the control group using SPSS 17.0 program. It could be seen that there was a student got 35 (3.1%), two students got 40

(6.3%), six students got 45 (18.8%), four students got 50 (12.5%), eight students got 55 (25.0%), four students got 60 (12.5%), three students got 65 (9.4%), two students got 70 (6.3%), and two students got 75 (6.3%).

The next step, the writer calculated the score of mean, median, modus, standard deviation and standard error of post test score in control group as follows:

Table 4.20 The Calculation of Mean, Median, Modus, Standard Deviation and Standard Error of Post Test Scores of the Control Group Using SPSS 17.0 Program

STATISTICS

VAR00001

N	Valid	32
	Missing	0
Mean		54.6875
Std. Error of Mean		1.79518
Median		55.0000
Mode		55.00
Std. Deviation		10.15505
Variance		103.125
Range		40.00
Minimum		35.00
Maximum		75.00
Sum		1750.00

The table showed the result of mean calculation was 54.68, the result of median calculation was 55.00, and the result of mode calculation was 55.00. The result of standard deviation calculation was 10.15 and the result of standard error of mean calculation was 1.79.

B. The Result of Data Analysis

Before calculate the t-test, the writer test the normality and the homogeneity of the data. After found the normality and the homogeneity of the data, the writer calculated the t-test. The writer used both manual calculation and SPSS 17.0 program calculation. Both results are expected to support the correct calculation each other.

1. Testing the Normality and Homogeneity

a. Testing the Normality

In this study, the writer used SPSS 17.0 program to calculated the normality. The testing of normality used to know that the distribution of the data was normal or not. The result of testing the normality using SPSS 17.0 program could be seen as follows:

Table 4.21 Testing the Normality Using SPSS 17.0 Program

Testing of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	VAR00002	Statistic	df	Sig.	Statistic	df	Sig.
VAR00001	Experiment	.103	32	.200*	.969	32	.482
	Control	.144	32	.090	.963	32	.335

Based on the result of testing the normality, it was found that the value of the significance of the experiment group was 0.200 and the value of the significance of the control group was 0.090. It meant that the distribution of the data was normal because the value of the significance was greater than 0.05.

b. Testing the Homogeneity

The writer used SPSS 17.0 program to calculated the homogeneity. The testing of homogenity used to know that the data was homogeneous or not. The result of testing the homogeneity using SPSS 17.0 program could be seen as follows:

Table 4.22 Testing the Homogeneity Using SPSS 17.0 Program

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
VAR00001	Based on Mean	.075	1	62	.785
	Based on Median	.097	1	62	.757
	Based on Median and with adjusted df	.097	1	61.296	.757
	Based on trimmed mean	.066	1	62	.798

Based on the result of testing the homogeneity, it was found that the value of the probability was 0.798. The data will be homogeneous if the probability or $p > 0,05$. It meant that the variant of the sample was homogeneous because the value of the probability was greater than 0.05 (0.798 > 0,05).

2. Testing Hypothesis Using Manual Calculation

The writer chose the significance level on 5%, it means that 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).

To test the hypothesis of the study, the writer used t-test statistical calculation. Firstly, the writer calculated the standard

deviation and the standard 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 the following table.

Table 4.23 The Standard Deviation and the Standard Error of X_1 and X_2

Variable	The Standard Deviation	The Standard Error
X_1	10.353	1.859
X_2	10.119	1.817

Where :

X_1 : Experimental Group

X_2 : Control Group

The table showed the result of the standard deviation calculation of X_1 was 10,353 and the result of the standard error mean calculation was 1.859. The result of the standard deviation calculation of X_2 was 10.119 and the result of the standard error mean calculation was 1.817.

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

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

$$= \sqrt{1{,}859^{\,2} + 1{,}817^2}$$

$$= \sqrt{3{,}455881 + 3{,}301489}$$

$$= \sqrt{6{,}75737}$$

$= 2{,}599494182$

$= 2{,}599$

The calculation above showed the standard error of the differences mean between X_1 and X_2 was 2.599. Then, it was inserted to the t_o formula to get the value of t-observed as follows:

$$t_o = \frac{M_1 - M_2}{SE_{M1} - SE_{M2}}$$

$$= \frac{77{,}25 - 54{,}187}{2{,}599}$$

$$= \frac{23{,}063}{2{,}599}$$

$$= 8{,}873797614$$

$$= 8{,}873$$

With the criteria:

- If t- test ($t_{observed}$) ≥ t-table, it means that H_a is accepted and H_o is rejected.
- If t- test ($t_{observed}$) < t-table, it means that 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 $= (N_1 + N_2 - 2)$

$= (32 + 32 - 2)$

$= 62$

Where :

df : Degree of freedom

N_1 : Number of subject group 1

N_2 : Number of subject group 2

2 : Number of variable

t_{table} at df 62/60 at 5% sigificant level = 2.000

$t_{observed} = 8.873 > t_{table} = 2.000$ **(H_a was accepted)**

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-observe	t-table		df/db
		5%	1%	
$X_1 - X_2$	8.873	2.000	2.660	62

Where :

X_1 : Eperimental Group

X_2 : Control Group

t-observe : The Calculated Value

t-table : The Distribution of Value

df/db : Degree of Freedom

Based on the result of hypothesis test calculation, it was found that the value of $t_{observed}$ was greater than the value of t_{table} at 1% and 5% significance level or 2.000 < 8.873 > 2.660. It meant that H_a was accepted and H_o was rejected.

It could be interpreted based on the result of calculation that H_a stating that the jumbled letters game will give effect on the vocabulary achievement scores was accepted and H_o stating that the jumbled letters game will not give effect on the vocabulary achievement scores was rejected. It meant that the jumbled letters game give effect on the vocabulary achievement scores of third grade students of SDN-VIII Menteng Palangka Raya.

3. Testing Hypothesis Using SPSS Calculation

The writer also applied SPSS 17.0 program to calculate t-test in testing the hypothesis of the study. The result of the t-test using SPSS 17.0 was used to support the manual calculation of the t-test. The result of the t-test using SPSS 17.0 program could be seen as follows:

Table 4.25 The Standard Deviation and the Standard Error of X_1 and X_2 Using SPSS 17.0 Program

GROUP STATISTICS

	VAR00001	N	Mean	Std. Deviation	Std. Error Mean
VAR00002	1.00	32	77.3438	10.15877	1.79583
	2.00	32	54.6875	10.15505	1.79518

The table showed the result of the standard deviation calculation of X_1 was 10.158 and the result of the standard error mean calculation was 1.795. The result of the standard deviation calculation of X_2 was 10.155 and the result of the standard error mean calculation was 1.795.

Table 4.26 The Calculation of T-test Using SPSS 17.0 Program

INDEPENDENT SAMPLES TEST

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
VAR00002	Equal variances assumed	.075	.785	8.922	62	.000	22.65625	2.53923	17.58041	27.73209
	Equal variances not assumed			8.922	62.000	.000	22.65625	2.53923	17.58041	27.73209

The table showed the result of t-test calculation using SPSS 17.0 program. Since the result of post test between experimental group and control group had difference score of variance, it meant that the t-test calculation used at the equal variances not assumed. It found that the result of $t_{observed}$ was 8.922, the result of mean difference between experimental group and control group was 22.656, and the standard error difference between experimental group and control group was 2.539.

To examine the true or the false of null hypothesis stating that the jumbled letters game will not give effect on the vocabulary achievement scores, the result of t-test was interpreted on the result of degree of freedom to get the t_{table}. The result of degree of freedom (df)

was 62. The following table was the result of $t_{observed}$ and t_{table} from 62 df at 5% and 1% significance level.

Table 4.27 The Result of T-test Using SPSS 17.0 Program

Variable	t-observed	t-table		Df/db
		5%	1%	
$X_1 - X_2$	8.922	2.000	2.660	62

The interpretation of the result of t-test using SPSS 17.0 program, it was found that the value of $t_{observed}$ was greater than the value of t_{table} at 1% and 5% significance level or 2.000 < 8.922 > 2.660. It meant that H_a was accepted and H_o was rejected.

C. Discussion

The result of the data analysis showed that the jumbled letters game gave effect on the vocabulary achievement scores of third grade students of SDN-VIII Menteng Palangka Raya. The students who were taught using jumbled letters game got higher score than the students who were taught without jumbled letters game. It was proved by the mean score of the students who were taught using jumbled letters game got 77.250 and the students who were taught without using jumbled letters game got 54.187. It was also proved by the result of hypothesis test calculation, it was found that the value of $t_{observed}$ was greater than the value of t_{table} at 1% and 5% significance level or 2.000 < 8.873 > 2.660. It meant that H_a was accepted and H_o was rejected.

Furthermore, the result of t-test calculation using SPSS 17.0 program found that the jumbled letters game gave effect on the vocabulary achievement scores. It was proved by the mean score of the

students who were taught using jumbled letters game got 77.343 and the students who were taught without using jumbled letters game got 54.687. It was also proved by the value of $t_{observed}$ was greater than the value of t_{table} both at 1% and 5% significance level or 2.000 < 8.922 > 2.660. It meant that H_a was accepted and H_o was rejected.

The findings of the study based on the result of manual calculation and SPSS 17.0 program calculation could be interpreted that the alternative hypothesis stating that the jumbled letters game will give effect on the vocabulary achievement scores was accepted and null hypothesis stating that the jumbled letters game will not give effect on the vocabulary achievement scores was rejected.

There were some possible reasons why the jumbled letters game gave effect on the vocabulary achievement scores of third grade students of SDN-VIII Menteng Palangka Raya. First, the jumbled letters game in the teaching vocabulary is more interesting because the teacher asked the students of third grade students of SDN-VIII Menteng Palangka Raya to arrange the jumbled letters. It can improve the student's vocabulary writing and spelling.

Second, by using jumbled letters game the students were not got bored in the teaching and learning activities. Third, by using jumbled letters games the students were able to learn the target language unconsciously and the students could memorize the words very well.

Fourth, jumbled letters games can help the students of third grade students of SDN-VIII Menteng Palangka Raya to arouse their self confident, more creatively and decrease the anxiety from acquiring the language.

The findings of the study verified the statement of Gertrude Nye Dorrry that "the jumbled letters game in the teaching vocabulary is more interesting. Second, by using jumbled letters game the students will not get bored in the teaching and learning activities. Third, by using jumbled letters games the students are able to learn the target language unconsciously. Fourth, jumbled letters games can help the students to arouse their self confident, more creatively and decrease the anxiety from acquiring the language." [1]

According to Larcabal, a game can help those who play develop their inner self, help them related to other more effectively and cooperatively, train them in creative freedom as they feel less embarrassed or afraid and become more self confident.[2] According to Bradley, games provide an enjoyable learning experience. Creating a fun and enjoyable learning environment is a large first step toward motivating students. [3]

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[1] Gertrude Nye Dorrry, *Games For Second Language Learning,* (New York: Mc. Braw-Hill, Inc, 1966) p. 21.

[2] Larcabal Rita Susana, *The Role of Games in Language Acquisition*, (English teaching Forum Vol. 30, 1992), p. 28.

[3] Luu Trong Tuan, *Vocabulary Recollection Through Games,* (Vietnam: Academy Publisher, 2012), p. 260.

According to David and Roger, they said that games are attractive, because they are fun, the pleasant relaxes atmosphere fostered by the games has proven to be efficient learning.[4] As far as learning vocabulary is concerned, Nguyen & Khuat point out games help learners to learn and retain new words more easily. They also mentioned that vocabulary games enable learners to use English in a meaningful communicative context. It is understandable when one considers that games require physical participation of the learners and they no longer confine themselves to sitting on desks in rows. Games act as a powerful force to motivate learners and draw out the quiet or unsure learners.[5]

[4] David W. Johnson and Roger T. Johnson, *Learning Together and Alone, Cooperation, Competitive and Individualization*, (New Jersey: Prentive Hall. Inc. Englewood Cliffs, 1975) p.100.

[5] Iran Dolati, *Effects of Instructional Games on Facilitating of Students' Vocabulary Learning*, (Iran : Australian Journal of Basic and Applied Sciences, 2011), p. 1220.