

## **CHAPTER IV**

### **RESULT OF THE STUDY AND DISCUSSION**

This chapter discussed the data which had been collected from the research in the field of study. this case consisted of Description of the Data of the effect of mnemonic device toward students' vocabulary.

#### **A. Description of The Data**

##### **1. The Result of Pre Test Score of the Experiment Class and Control Class**

The writer gave pre test to the experiment class and control class. First, pre test was conducted to the experiment class. It was conducted on Monday, May 02<sup>nd</sup>, 2016, at 12.00-13.20 pm; in VIII A room with the number of student were 30 students. Then, pre test was conducted to control class. It was conducted on Tuesday, May 03<sup>th</sup>, 2016, at 07.20-08.20 am; in VIII B room with the number of student were 30 students. For the table of pre test score of experiment class and control class,

##### **2. Description of Pre Test and Post Test Score of the Experiment Class and Control Class**

This section discussed the obtained data of the student's vocabulary score using mnemonic toward students' vocabulary. The presented data consisted of pre-test and post-test score. The function of the table is to compare

the result of the students' pre-test and post test scores. The comparison pre-test and post test scores were presented in the following table:

**Table 4. 1**

**Pre Test and Post Test Score of the Experiment Class and Control Class**

EXPERIMENTAL CLASS					CONTROL CLASS				
NO	CODE	SCORE			NO	CODE	SCORE		
		PRE-TEST	POST-TEST	DIFFERENCE			PRE-TEST	POST-TEST	DIFFERENCE
1	W01	37	51	14	1	D01	29	34	5
2	W02	41	76	35	2	D02	34	54	20
3	W03	59	71	12	3	D03	32	56	24
4	W04	56	80	24	4	D04	44	66	22
5	W05	68	88	20	5	D05	27	44	17
6	W06	24	46	22	6	D06	22	27	5
7	W07	39	59	20	7	D07	37	20	17
8	W08	39	54	15	8	D08	39	49	10
9	W09	34	46	12	9	D09	10	29	10
10	W10	44	85	41	10	D10	29	54	25
11	W11	59	71	12	11	D11	44	61	17
12	W12	54	71	17	12	D12	34	51	17
13	W13	54	83	29	13	D13	37	44	7
14	W14	34	61	27	14	D14	27	51	24

15	W15	22	41	19	15	D15	41	32	9
16	W16	51	73	22	16	D16	32	39	7
17	W17	63	80	17	17	D17	51	49	2
18	W18	27	49	22	18	D18	41	46	5
19	W19	34	51	17	19	D19	37	56	19
20	W20	41	76	35	20	D20	37	54	17
21	W21	51	71	20	21	D21	37	41	4
22	W22	54	71	17	22	D22	41	46	5
23	W23	22	37	15	23	D23	39	41	2
24	W24	46	61	15	24	D24	41	68	27
25	W25	29	51	22	25	D25	20	32	12
26	W26	51	78	27	26	D26	32	41	9
27	W27	39	51	12	27	D27	39	37	2
28	W28	46	63	17	28	D28	22	49	27
29	W29	49	80	49	29	D29	41	63	22
30	W30	27	39	12	30	D30	34	39	5
<b>TOTAL</b>		<b>1294</b>	<b>1914</b>	<b>638</b>	<b>TOTAL</b>		<b>1030</b>	<b>1373</b>	<b>394</b>
<b>MEAN</b>		<b>43.1</b>	<b>63.9</b>	<b>20.8</b>	<b>MEAN</b>		<b>34</b>	<b>46.1</b>	<b>12.1</b>
<b>LOWEST</b>		<b>22</b>	<b>37</b>	<b>15</b>	<b>LOWEST</b>		<b>10</b>	<b>20</b>	<b>10</b>
<b>HIGHEST</b>		<b>68</b>	<b>88</b>	<b>20</b>	<b>HIGHEST</b>		<b>51</b>	<b>68</b>	<b>17</b>

From the table above the mean score of pre test and post test of the experimental class were 43.1 and 63.9. Meanwhile, the highest score pre test and post test of the

experimental class were 68 and 88, the lowest scores pre test and post test of the experimental class were 22 and 37. In addition, the mean score pre test and post test of the control class was 34 and 46.1, meanwhile, the highest score pre test and post test of the control class was 51 and 68. The lowest scores pre test and post test of the control class were 10 and 20. Based on the data above, the difference of mean score between experimental and control group score was .

## B. Test of Statistical Analysis

### 1. The Result of Pre-Test Score

The students' pre test score are distributed in the following table in order to analyze the students' knowledge before conducting the treatment.

The distribution of students' pretest score can also be seen in the following table :

**Table 4.2**

**Pre test score of experimental and control class**

NO	Experimental Class				Control Class			
	Code	SCORE	CORRECT ANSWER	PREDICATE	CODE	SCORE	CORRECT ANSWER	PREDICATE
1	W01	37	14	LESS	D01	29	12	FAIL
2	W02	41	17	LESS	D02	34	14	LESS
3	W03	59	24	ENOUGH	D03	32	13	FAIL
4	W04	56	23	LESS	D04	44	18	FAIL
5	W05	68	28	ENOUGH	D05	27	11	FAIL
6	W06	24	10	FAIL	D06	22	9	FAIL

7	W07	39	16	LESS	D07	37	15	LESS
8	W08	39	16	LESS	D08	39	16	LESS
9	W09	34	14	LESS	D09	10	4	FAIL
10	W10	44	18	LESS	D10	29	12	FAIL
11	W11	59	24	ENOUGH	D11	44	18	LSS
12	W12	54	22	LESS	D12	34	14	LESS
13	W13	54	22	LESS	D13	37	15	LESS
14	W14	34	14	LESS	D14	27	11	FAIL
15	W15	22	9	FAIL	D15	41	17	LESS
16	W16	51	21	LESS	D16	32	13	FAIL
17	W17	63	26	ENOUGH	D17	51	21	LESS
18	W18	27	11	FAIL	D18	41	17	LESS
19	W19	34	14	LESS	D19	37	15	LESS
20	W20	41	17	LESS	D20	37	15	LESS
21	W21	51	21	LESS	D21	37	15	LESS
22	W22	54	22	LESS	D22	41	17	LESS
23	W23	22	9	FAIL	D23	39	16	LESS
24	W24	46	19	LESS	D24	41	17	LESS
25	W25	29	12	FAIL	D25	20	8	FAIL
26	W26	51	21	LESS	D26	32	13	FAIL
27	W27	39	16	LESS	D27	39	16	LESS
28	W28	46	19	LESS	D28	22	9	FAIL

29	W29	49	20	LESS	D29	41	17	LESS
30	W30	27	11	FAIL	D30	34	14	LESS
TOTAL		1294		TOTAL		1030		
AVERAGE		43.13		AVERAGE		33.33		
lowest score		22		lowest score		10		
Highest score		68		Highest score		51		

The table above showed us the comparison of pre-test score achieved by experimental and control class students, both class' achievement are at the differences level. It can be seen that from the students' score. The score of experimental class, the highest score 68 and the lowest score 22. The score of control class the highest score 51 and the lowest score 10. It meant that the experimental and control class have the differences in vocabulary before getting the treatment.

## 2. Description of Pre Test Score of the Experiment Class

Based on the data above, it was known the highest score was 68 and the lowest score was 22. To determine the range of score, the class interval, and the interval of temporary, the writer calculated using formula as follows:

The highest score (H) : 68

The lowest score (L) : 22

The range of score (R) =  $H - L + 1$

$$= 68 - 22 + 1$$

$$= 46 + 1$$

$$= 47$$

$$\text{The class interval (K)} = 1 + (3.3) \times \log n$$

$$= 1 + (3.3) \times \log 30$$

$$= 1 + 4.874500$$

$$= 5.874500$$

$$= 6$$

$$\text{Interval of temporary (I)} = \frac{R}{K} = \frac{47.3}{6} = 7.8 = 8$$

From the calculation above, it could be seen that the range of score was 47, the class interval was 6, and interval of temporary was 8. Then, it was presented using frequency distribution in the following table.

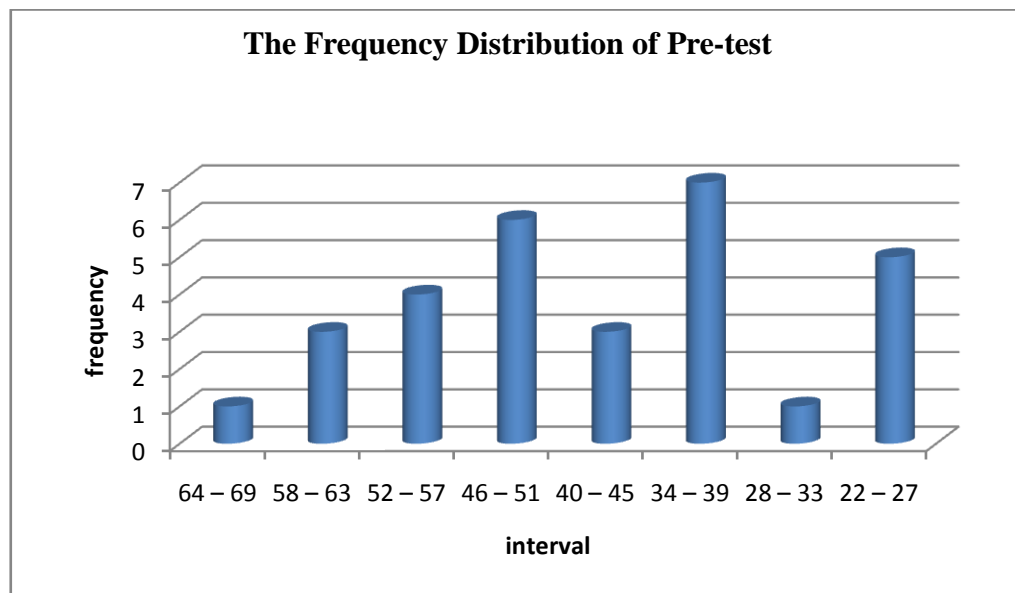
**Table 4.3**

**Frequency Distribution of Pre Test Score of the Experiment Class**

No	Interval (I)	Frequency (F)	Mid Point (X)	FX
1	64 – 69	1	66.55	66.5

2	58 – 63	3	60.5	181.5
3	52 – 57	4	54.5	218
4	46 – 51	6	48.5	291
5	40 – 45	3	42.5	127.5
6	34 – 39	7	36.5	255.5
7	28 – 33	1	30.5	30.5
8	22 – 27	5	24.5	122.5
		<b>N=30</b>		<b><math>\Sigma FX=1293</math></b>

**Figure 4.1**  
**The Frequency Distribution of Experimental Pre-test Score**



It can be seen from the figure above about the students' pretest score. There were five students who got score among 22-27. There is one



student who got score between 28-33. There were seven students who got score among 34-39. There were three students who got score among 40-45. There were six students who got score between 46-51. There were four students who got score among 52-57. There were three students who got score among 58-63. There were one student who got score between 64-69.

Based on the pre-test score of experiment group, there were four students who got score among 22-33, so the students' ability was fail. There were twenty students who got score among 34-56, so the students' ability was less. There were four students who got score among 57-68, so the students' ability was enough.

The next step, the writer tabulated the score of pre test of experiment class into table for calculating of mean, median, and modus as follows:

**Table 4.5**

**The Calculation of Mean, Median, and Modus of Pre Test Score of the Experiment Class**

No	Interval (I)	Frequency (F)	Mid Point (X)	FX	Fka	Fkb
1	64 – 69	1	66.55	66.5	1	30
2	58 – 63	3	60.5	181.5	4	29
3	52 – 57	4	54.5	218	8	26

4	46 – 51	6	48.5	291	14 <sub>fka</sub>	22
5	<b>40 – 45</b>	3 <sub>fi/fa</sub>	42.5	127.5	<b>17</b>	<b>16</b>
6	34 – 39	7	36.5	255.5	24	13 <sub>fkb</sub>
7	28 – 33	1 <sub>fb</sub>	30.5	30.5	25	6
8	22 – 27	5	24.5	122.5	30	5
		<b>N=30</b>		<b>∑FX=1293</b>		

The next step, the writer tabulated the score of pre test of experiment class into table for calculating of standard deviation and standard error as follows:

**Table 4.6**

**The Calculation of Standard Deviation and Standard Error of Pre Test**

**Score of the Experiment Class**

No	Interval	F	X	FX	X-M	X <sup>2</sup>	FX <sup>2</sup>
1	64 – 69	1	66.55	66.5	23.4	547.56	547.56
2	58 – 63	3	60.5	181.5	17.4	302.56	908.28
3	52 – 57	4	54.5	218	11.3	127.69	510.76
4	46 – 51	6	48.5	291	5.4	29.16	174.96

5	40 – 45	3	42.5	127.5	- 0.6	0.36	1.08
6	34 – 39	7	36.5	255.5	- 6.6	43.56	304.92
7	28 – 33	1	30.5	30.5	- 12.6	158.76	158.76
8	22 – 27	5	24.5	122.5	- 18.6	345.96	1729.8
		<b>N=30</b>		<b>∑FX=1293</b>			<b>∑FX<sup>2</sup>=4336 .12</b>

Then, the writer tabulated the score of pre test of experiment class into table for calculating of mean, median, and modus..To calculate mean, median, and modus, the writer used formula as follow:

**a. Mean**

$$\begin{aligned}
 Mx &= \frac{\sum fx}{N} \\
 &= \frac{1293}{30} \\
 &= 43.1
 \end{aligned}$$

**b. Median**

Score: 40 – 45

fi: 3

fka: 14

i: 6

u:  $45 + 0.5 = 45.5$

$$\begin{aligned}
 Mdn &= u - \frac{\left(\frac{1}{2}N - fka\right)}{fi} \times i \\
 &= 45.5 - \frac{\left(\frac{1}{2} \cdot 30 - 14\right)}{3} \times 6 \\
 &= 45.5 - \frac{(15-14)}{3} \times 6 \\
 &= 45.5 - \frac{1}{3} \times 6 \\
 &= 45.5 - 2 = 43.5
 \end{aligned}$$

**c. Modus**

Score: 34 – 39

fa: 3

fb: 1

i: 6

u:  $39 + 0.5 = 39.5$

$$\begin{aligned}
 Mo &= u - \left[ \frac{fb}{fa + fb} \right] \times i \\
 &= 39.5 - \left[ \frac{1}{3 + 1} \right] \times 6 \\
 &= 39.5 - \frac{1}{4} \times 6 \\
 &= 39.5 - 1.5 = 38
 \end{aligned}$$

Based on the calculation above, it could be seen that the mean of the experiment class was 43.1, the median was 43.5, and the mode was 38.

The next step, the writer tabulated the score of pre test of experiment class into table for calculating of standard deviation and standard error. To calculate standard deviation and standard error, the writer used formula as follow:

**d. Standard Deviation**

$$\begin{aligned}
 SD &= \sqrt{\frac{\sum fx^2}{N}} \\
 &= \sqrt{\frac{4336.12}{30}} \\
 &= \sqrt{144.537} \\
 &= 12.022
 \end{aligned}$$

**e. Standard Error**

$$\begin{aligned}
 Sem &= \frac{sd}{\sqrt{n-1}} \\
 &= \frac{12.022}{\sqrt{30-1}} = \frac{12.022}{\sqrt{29}} = 2.232
 \end{aligned}$$

Based on the calculation above, it could was seen that standard deviation was 12.022 and standard error was 2.232.

**3. Description of pre test control class**

Based on the result of research in class VIII B as control class before was taught by handout, the highest pre test score was 51 and the lowest pre test score was 10.

To determine the range of score and the interval of temporary, the writer calculated using formula as follows:

The highest score (H) : 51

The lowest score (L) : 10

The range of score (R) =  $H - L + 1$   
 $= 51 - 10 + 1$   
 $= 41 + 1 = 42$

Interval of temporary (I) =  $\frac{R}{K} = \frac{42}{5} = 8.4 = 9$

From the calculation above, it could be seen that the range of score was 42, and interval of temporary was 9.

#### **4. The Result of Pre Test Score of the Control Class**

Then, it was presented using frequency distribution in table 4.5 as follows:

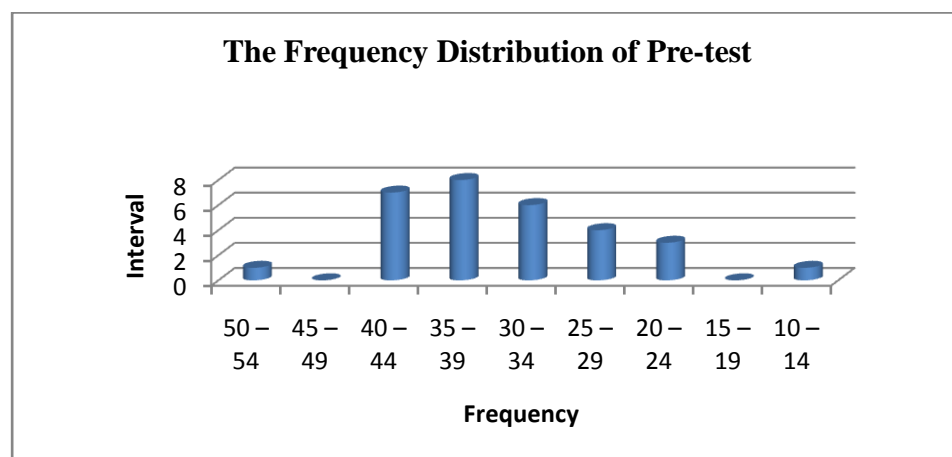
**Table 4.7**

### Frequency Distribution of Pre Test Score of the Control Class

No	Interval (I)	Frequency (F)	Mid Point (X)	FX
1	50 – 54	1	52	52
2	45 – 49	0	47	0
3	40 – 44	7	42	294
4	35 – 39	8	37	296
5	30 – 34	6	32	192
6	25 – 29	4	27	108
7	20 – 24	3	22	66
8	15 – 19	0	17	0
9	10 – 14	1	12	12
		<b>N=30</b>		<b><math>\Sigma</math>FX=1020</b>

Figure 4.2

### The Frequency Distribution of Pre-test



It can be seen from the figure above about the students' pretest score. There were one student who got score among 10-14. There were zero student who got score between 15-19. There were three students who got score among 20-24. There were four students who got score among 25-29. There were six students who got score between 30-34. There were eight students who got score among 35-39. There were seven students who got score among 40-44. There were zero student who got score between 45-49. There is one student who got score between 50-54.

Based on the pre-test score of control group, there were thirteen students who got score among 10-33, so the students' ability was fail. There were seventeen students who got score among 34-54, so the students' ability was less.

The next step, the writer tabulated the score of pretest of control class into table for calculating of mean, median, and modus as follows:

**Table 4.8**

**The Calculation of Mean, Median, and Modus of Pre Test Score of the Control Class**

No	Interval (I)	Frequency (F)	Mid Point (X)	FX	Fka	Fkb
1	50 – 54	1	52	52	1	30



2	45 – 49	0	47	0	1	29
3	40 – 44	7 <sub>fa</sub>	42	294	8 <sub>fka</sub>	29
4	<b>35 – 39</b>	8 <sub>fi</sub>	37	296	<b>16</b>	<b>22</b>
5	30 – 34	6 <sub>fb</sub>	32	192	22	14 <sub>fkbb</sub>
6	25 – 29	4	27	108	26	8
7	20 – 24	3	22	66	29	4
8	15 – 19	0	17	0	29	1
9	10 – 14	1	12	12	30	1
		<b>N=30</b>		<b>∑FX=1020</b>		

The next step, the writer tabulated the score of pre test of control class into table for calculating of standard deviation and standard error as follows:

**Table 4.9**

**The Calculation of Standard Deviation and Standard Error of Pre Test  
Score of the Control Class**

No	Interval	F	X	FX	X-M	X <sup>2</sup>	FX <sup>2</sup>
1	50 – 54	1	52	52	18	324	324
2	45 – 49	0	47	0	13	169	0
3	40 – 44	7	42	294	8	64	448
4	35 – 39	8	37	296	3	9	72

5	30 – 34	6	32	192	-2	4	24
6	25 – 29	4	27	108	-7	49	196
7	20 – 24	3	22	66	-12	144	432
8	15 – 19	0	17	0	-17	289	0
9	10 – 14	1	12	12	-22	484	484
		<b>N=30</b>		<b>∑FX=1020</b>			<b>∑FX<sup>2</sup>=1980</b>

Then, the writer tabulated the score of pre test of control class into table for calculating of mean, median, and modus. To calculate mean, median, and modus, the writer used formula as follow:

**a. Mean**

$$\begin{aligned}
 Mx &= \frac{\sum fx}{N} \\
 &= \frac{1020}{30} \\
 &= 34
 \end{aligned}$$

**b. Median**

Score: 35 – 39

fi: 8

fka: 8

i: 5

$$u: 39 + 0.5 = 39.5$$

$$\begin{aligned} Mdn &= u - \frac{\left(\frac{1}{2}N - fka\right)}{fi} \times i \\ &= 39.5 - \frac{\left(\frac{1}{2} \cdot 30 - 8\right)}{8} \times 5 \\ &= 39.5 - \frac{(15-8)}{8} \times 5 \\ &= 39.5 - \frac{7}{8} \times 5 \\ &= 39.5 - 4.3 = 35.2 \end{aligned}$$

**c. Modus**

$$\text{Score: } 34 - 39$$

$$fa: 3$$

$$fb: 1$$

$$i: 5$$

$$u: 39 + 0.5 = 39.5$$

$$\begin{aligned} Mo &= u - \left[ \frac{fb}{fa + fb} \right] \times i \\ &= 39.5 - \left[ \frac{6}{7 + 6} \right] \times 5 \\ &= 39.5 - \frac{6}{13} \times 5 \\ &= 39.5 - 2.3 = 37.2 \end{aligned}$$

Based on the calculation above, it could be seen that mean of control class was 34, median was 35.2, and modus was 37.2.

The next step, the writer tabulated the score of pre test of control class into table for calculating of standard deviation and standard error. To calculate standard deviation and standard error, the writer used formula as follow:

**d. Standard Deviation**

$$\begin{aligned} SD &= \sqrt{\frac{\sum f x^2}{N}} \\ &= \sqrt{\frac{1980}{30}} \\ &= \sqrt{66} \\ &= 8.124 \end{aligned}$$

**e. Standard Error**

$$Sem = \frac{sd}{\sqrt{n-1}} = \frac{8.124}{\sqrt{30-1}} = \frac{8.124}{5.385} = 1.509$$

Based on the calculation above, it could be seen that standard deviation was 8.124 and standard error was 1.509.

**5. The Result of Post-Test Score**

The students' score are distributed in the following table in order to analyze the students' knowledge after conducting the treatment.

**Table 4. 10**  
**Post-Test Score**

	<b>Experimental Class</b>	<b>Control Class</b>
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<b>NO</b>	<b>Code</b>	<b>SCORE</b>	<b>CORRECT ANSWER</b>	<b>PREDICATE</b>	<b>CODE</b>	<b>SCORE</b>	<b>CORRECT ANSWER</b>	<b>PREDICATE</b>
1	W01	51	21	LESS	D01	34	14	LESS
2	W02	76	31	GOOD	D02	54	22	LESS
3	W03	71	29	ENOUGH	D03	56	23	LESS
4	W04	80	33	GOOD	D04	66	27	ENOUGH
5	W05	88	36	GOOD	D05	44	18	LESS
6	W06	46	19	LESS	D06	27	11	FAIL
7	W07	59	24	ENOUGH	D07	20	8	FAIL
8	W08	54	22	LESS	D08	49	20	LESS
9	W09	46	19	LESS	D09	29	12	FAIL
10	W10	85	35	GOOD	D10	54	22	LESS
11	W11	71	29	ENOUGH	D11	61	25	ENOUGH
12	W12	71	29	ENOUGH	D12	51	21	LESS
13	W13	83	34	GOOD	D13	44	18	LESS
14	W14	61	25	ENOUGH	D14	51	21	LESS
15	W15	41	17	GOOD	D15	32	13	FAIL
16	W16	73	30	GOOD	D16	39	16	LESS
17	W17	80	33	GOOD	D17	49	20	LESS
18	W18	49	20	ENOUGH	D18	46	19	LESS
19	W19	51	21	LESS	D19	56	23	LESS
20	W20	76	31	GOOD	D20	54	22	LESS

21	W21	71	29	ENOUGH	D21	41	17	LESS
22	W22	71	29	ENOUGH	D22	46	19	LESS
23	W23	37	15	LESS	D23	41	17	LESS
24	W24	61	25	ENOUGH	D24	68	28	ENOUGH
25	W25	51	21	LESS	D25	32	13	FAIL
26	W26	78	32	GOOD	D26	41	17	LESS
27	W27	51	51	ENOUGH	D27	37	15	LESS
28	W28	63	26	ENOUGH	D28	49	20	LESS
29	W29	80	33	GOOD	D29	63	26	ENOUGH
30	W30	39	16	LESS	D30	39	16	LESS
<b>TOTAL</b>		1914		<b>TOTAL</b>		1373		
<b>AVERAGE</b>		63.8		<b>AVERAGE</b>		45.7		
<b>lowest score</b>		37		<b>lowest score</b>		20		
<b>Highest score</b>		88		<b>Highest score</b>		68		

The table above showed us the comparison of post-test score achieved by experimental and control class students. Both class' achievement have different score. It can be seen from the highest score 88 and 68 and the lowest score 37 and 20. It meant that the experimental and control class have the different level in English vocabulary after getting the treatment.

**a. The Result of Post-test Score of Experiment Group (VIII-A)**

Based on the data above, it was known the highest score was 88 and the lowest score was 37. To determine the range of score and the interval of temporary, the writer calculated using formula as follows:

$$\text{The highest score (H)} \quad : 88$$

$$\text{The lowest score (L)} \quad : 37$$

$$\text{The range of score (R)} \quad = H - L + 1$$

$$= 88 - 37 + 1$$

$$= 51 + 1$$

$$= 52$$

$$\text{The class interval (K)} \quad = 1 + (3.3) \times \log n$$

$$= 1 + (3.3) \times \log 30$$

$$= 1 + 4.874500 \quad = 5.874500$$

$$= 6$$

$$\text{Interval of temporary (I)} = \frac{R}{K} = \frac{52}{6} = 8.6 = 9$$

From the calculation above, it could be seen that the range of score was 52, the class interval was 6, and interval of temporary was 9.

Then, the writer tabulated the score of post test of experiment class into table for calculating of mean, median, and modus.

Then, it was presented using frequency distribution in table as follow:

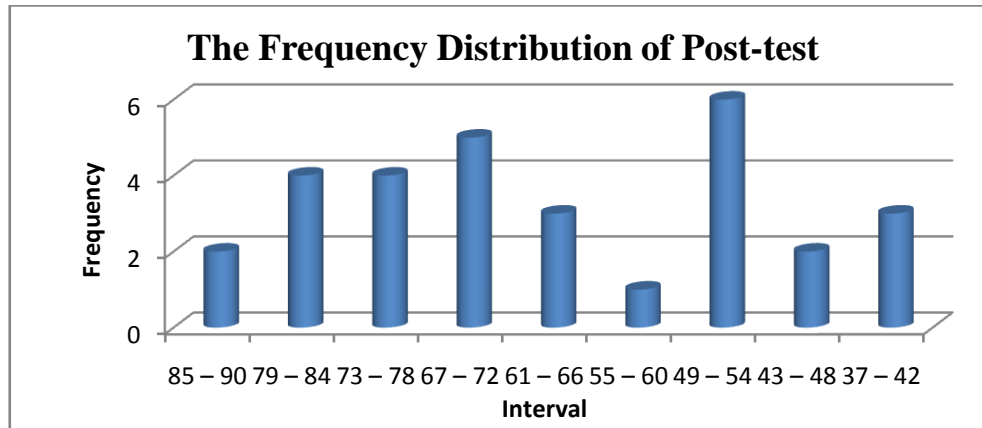
**Table 4.11**

**Frequency Distribution of Post Test Score of the Experiment Class**

No	Interval (I)	Frequency (F)	Mid Point (X)	FX
1	85 – 90	2	87.5	175
2	79 – 84	4	81.5	326
3	73 – 78	4	75.5	302
4	<b>67 – 72</b>	5	69.5	347.5
5	61 – 66	3	63.5	190.5
6	55 – 60	1	57.5	57.5
7	49 – 54	6	51.5	309
8	43 – 48	2	45.5	91
9	37 – 42	3	39.5	118.5
		<b>N=30</b>		<b><math>\Sigma</math>FX=1917</b>

**Figure 4.3**  
**The Frequency Distribution of Experimental Post-test Score**





It can be seen from the figure above about the students' pretest score. There were three students who got score among 37-42. There were two students who got score between 43-48. There were six students who got score among 49-54. There is one student who got score among 55-60. There were three students who got score between 61-66. There were five students who got score among 67-72. There were four students who got score among 73-78. There were four students who got score between 79-84. There were two students who got score between 85-90.

Based on the pre-test score of control group, there were twelve students who got score among 34-56, so the students' ability was less. There were eight students who got score among 57-71, so the students' ability was enough. There were ten students who got score among 72-89, so the students' ability was good.

The next step, the writer tabulated the score of posttest of experiment class into table for calculating of mean, median, and modus as follows:

**Table 4. 12**  
**The Calculation of Mean, Median, and Modus of Post Test Score of the**  
**Experiment Class**

No	Interval (I)	Frequency (F)	Mid Point (X)	FX	Fka	Fkb
1	85 – 90	2	87.5	175	2	30
2	79 – 84	4	81.5	326	6	28
3	73 – 78	4	75.5	302	10 <sub>fka</sub>	24
4	<b>67 – 72</b>	5 <sub>fi</sub>	69.5	347.5	<b>15</b>	<b>20</b>
5	61 – 66	3	63.5	190.5	18	15 <sub>fkb</sub>
6	55 – 60	1 <sub>fa</sub>	57.5	57.5	19	12
7	49 – 54	6	51.5	309	25	11
8	43 – 48	2 <sub>fb</sub>	45.5	91	27	5
9	37 – 42	3	39.5	118.5	30	3
		<b>N=30</b>		<b>∑FX=1917</b>		

The next step, the writer tabulated the score of post test of experiment class into table for calculating of standard deviation and standard error as follows:

**Table 4. 13**  
**The Calculation of Standard Deviation and Standard Error of Post**  
**Test Score of the Experiment Class**

No	Interval	F	X	FX	X-M	X <sup>2</sup>	FX <sup>2</sup>
1	85 – 90	2	87.5	175	23.6	556.96	1113.92
2	79 – 84	4	81.5	326	17.6	309.76	1239.04
3	73 – 78	4	75.5	302	11.6	134.56	538.24
4	67 – 72	5	69.5	347.5	5.6	31.36	156.8
5	61 – 66	3	63.5	190.5	-0.4	0.16	0.48
6	55 – 60	1	57.5	57.5	-6.4	40.96	40.96
7	49 – 54	6	51.5	309	-12.4	153.76	922.56
8	43 – 48	2	45.5	91	-18.4	338.56	677.12
9	37 – 42	3	39.5	118.5	-24.4	595.36	1786.08
		<b>N=30</b>		<b>∑FX=1917</b>			<b>∑FX<sup>2</sup>=6475.2</b>

To calculate mean, median, and modus, the writer used formula as follow:

**a. Mean**

$$\begin{aligned}
 Mx &= \frac{\sum fx}{N} \\
 &= \frac{1917}{30} \\
 &= 63.9
 \end{aligned}$$

**b. Median**

Score: 67 – 72

fi: 5

fka: 10

i: 6

$$u: 72 + 0.5 = 72.5$$

$$\begin{aligned} Mdn &= u - \frac{\left(\frac{1}{2}N - fka\right)}{fi} \times i \\ &= 72.5 - \frac{\left(\frac{1}{2} \cdot 30 - 10\right)}{5} \times 6 \\ &= 72.5 - \frac{(15-10)}{5} \times 6 \\ &= 72.5 - \frac{5}{5} \times 6 \\ &= 72.5 - 6 = 67 \end{aligned}$$

**c. Modus**

$$\text{Score: } 49 - 54$$

$$fa: 1$$

$$fb: 2$$

$$i: 6$$

$$u: 54 + 0.5 = 54.5$$

$$\begin{aligned} Mo &= u - \left[ \frac{fb}{fa + fb} \right] \times i \\ &= 54.5 - \left[ \frac{2}{1 + 2} \right] \times 6 \\ &= 54.5 - \frac{2}{3} \times 6 \\ &= 54.5 - 4 = 50.5 \end{aligned}$$

Based on the calculation above, it could be seen that mean value of experiment class was 63.9, median was 67, and modus was 50.5.

The next step, the writer tabulated the score of post test of experiment class into table for calculating of standard deviation and standard error. To calculate standard deviation and standard error, the writer used formula as follow:

**d. Standard Deviation**

$$\begin{aligned} SD &= \sqrt{\frac{\sum fx^2}{N}} \\ &= \sqrt{\frac{6475.2}{30}} \\ &= \sqrt{215.84} \\ &= 14.691 \end{aligned}$$

**e. Standard Error**

$$Sem = \frac{sd}{\sqrt{n-1}} = \frac{14.691}{\sqrt{30-1}} = \frac{14.691}{5.385} = 2.728$$

Based on the calculation above, it could be seen that standard deviation was 14.691 and standard error was 2.728.

**a. Description of Post Test Scores of the Control Class**

To determine the range of score and the interval of temporary, the writer calculated using formula as follows:

The highest score (H) : 68

The lowest score (L) : 20

$$\begin{aligned}
 \text{The range of score (R)} &= H + L - 1 \\
 &= 68 - 20 + 1 \\
 &= 48 + 1 = 49
 \end{aligned}$$

$$\text{Interval of temporary (I)} = \frac{R}{K} = \frac{49}{6} = 8,1 = 9$$

From the calculation above, it could be seen that the range of score was 49 and interval of temporary was 9.

Then, the writer tabulated the score of post test of control class into table for calculating of mean, median, and modus.

## 6. The Result of Post Test Score of the Control Class

Then, it was presented using frequency distribution in table as follow:

**Table 4. 12**

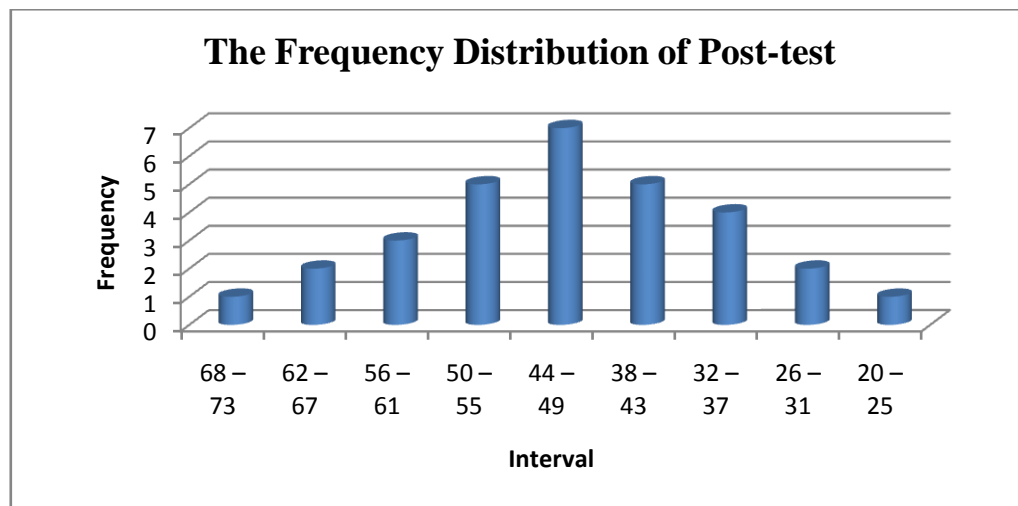
**Frequency Distribution of Post Test Score of the Control Class**

No	Interval (I)	Frequency (F)	Mid Point (X)	FX
1	68 – 73	1	70.5	70.5
2	62 – 67	2	64.5	129
3	56 – 61	3	58.5	175.5
4	50 – 55	5	52.5	262.5

5	44 – 49	7	46.5	325.5
6	38 – 43	5	40.5	202.5
7	32 – 37	4	34.5	138
8	26 – 31	2	28.5	57
9	20 – 25	1	22.5	22.5
		<b>N=30</b>		<b><math>\Sigma FX=1383</math></b>

**Figure 4.4**

**The Frequency Distribution of Post-test**



It can be seen from the figure above about the students' pretest score. There is one student who got score among 20-25. There were two students who got score between 26-31. There were four students who got score among 32-37. There were five students who got score among 38-43. There were seven students who got score between 44-49. There were

five students who got score among 50-55. There were three students who got score among 56-61. There were two students who got score among 62-67. There is one student who got score among 68-73.

Based on the post-test score of control group, there were twenty two students who got score among 34-56, so the students' ability was less. There were five students who got score among 57-71, so the students' ability was enough. There are three students who got score among 26-31, so the students' ability was fail.

The next step, the writer tabulated the score of post test of control class into table for calculating of mean, median, and modus as follows:

**Table 4. 13**

**The Calculation of Mean, Median, and Modus of Post Test Score of the Control Class**

No	Interval (I)	Frequency (F)	Mid Point (X)	FX	Fka	Fkb
1	68 – 73	1	70.5	70.5	1	30
2	62 – 67	2	64.5	129	3	29
3	56 – 61	3	58.5	175.5	6	27
4	50 – 55	5 <sub>fa</sub>	52.5	262.5	11 <sub>fka</sub>	24
5	<b>44 – 49</b>	7 <sub>fi</sub>	46.5	325.5	<b>18</b>	<b>19</b>
6	38 – 43	5 <sub>fb</sub>	40.5	202.5	23	12 <sub>fkb</sub>



7	32 – 37	4	34.5	138	27	7
8	26 – 31	2	28.5	57	29	3
9	20 – 25	1	22.5	22.5	30	1
		<b>N=30</b>		<b>∑FX=1383</b>		

The next step, the writer tabulated the score of post test of control class into table for calculating of standard deviation and standard error as follows:

**Table 4. 14**

**The Calculation of Standard Deviation and Standard Error of Post Test  
Score of the Control Class**

No	Interval	F	X	FX	X-M	X <sup>2</sup>	FX <sup>2</sup>
1	68 – 73	1	70.5	70.5	24.4	595.36	595.36
2	62 – 67	2	64.5	129	18.4	338.56	677.12
3	56 – 61	3	58.5	175.5	12.4	153.76	461.28
4	50 – 55	5 <sub>fa</sub>	52.5	262.5	6.4	40.96	204.8
5	<b>44 – 49</b>	7 <sub>fi</sub>	46.5	325.5	0.4	0.16	1.12
6	38 – 43	5 <sub>fb</sub>	40.5	202.5	-5.6	31.36	156.8
7	32 – 37	4	34.5	138	-1.6	2.56	10.24
8	26 – 31	2	28.5	57	-17.6	309.76	619.52

9	20 – 25	1	22.5	22.5	-23.6	556.96	556.96
		<b>N=30</b>		<b>∑FX=1383</b>			<b>∑FX=3283.96</b>

To calculate mean, median, and modus, the writer used formula as follow:

**a. Mean**

$$\begin{aligned}
 Mx &= \frac{\sum fx}{N} \\
 &= \frac{1383}{30} \\
 &= 46.1
 \end{aligned}$$

**b. Median**

Score: 40 – 49

fi: 7

fka: 11

i: 6

u:  $49 + 0.5 = 49.5$

$$\begin{aligned}
 Mdn &= u - \frac{\left(\frac{1}{2}N - fka\right)}{fi} \times i \\
 &= 49.5 - \frac{\left(\frac{1}{2} \cdot 30 - 11\right)}{7} \times 6 \\
 &= 49.5 - \frac{(15 - 11)}{7} \times 6 \\
 &= 49.5 - \frac{4}{7} \times 6
 \end{aligned}$$

$$= 49.5 - 3.4 = 46.1$$

**c. Modus**

Score: 40 – 49

fa: 5

fb: 5

i: 6

u:  $49 + 0.5 = 49.5$

$$\begin{aligned} Mo &= u - \left[ \frac{fb}{fa + fb} \right] \times i \\ &= 49.5 - \left[ \frac{5}{5 + 5} \right] \times 6 \\ &= 49.5 - \frac{5}{10} \times 6 \\ &= 49.5 - 3 = 46.5 \end{aligned}$$

Based on the calculation above, it could be seen that mean value of control class was 46.1, median was 46.1, and modus was 50.5.

The next step, the writer tabulated the score of post test of control class into table for calculating of standard deviation and standard error. To calculate standard deviation and standard error, the writer used formula as follow:

**d. Standard Deviation**

$$SD = \sqrt{\frac{\sum fx^2}{N}}$$

$$\begin{aligned}
 &= \sqrt{\frac{3283.2}{30}} \\
 &= \sqrt{109.44} \\
 &= 10.461
 \end{aligned}$$

**e. Standard Error**

$$Sem = \frac{sd}{\sqrt{n-1}} = \frac{10.461}{\sqrt{30-1}} = \frac{10.461}{5.385} = 1.943$$

Based on the calculation above, it could be seen that standard deviation was 10.461 and standard error was 1.943.

**C. The Result of Data Analysis**

**1. Testing Hypothesis Using Manual Calculation**

The writer used t test formula to examine hypothesis, before the writer examined hypothesis, the writer tabulated the score of standard deviation and standard error into table as follows:

**Table 4.15**

**The Standard Deviation and the Standard Error of Experiment Class and Control Class**

Group	Standard Deviation	Standard Error
Experiment	14.691	2.728

Control	10.461	1.943
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Based on the table above, it could be seen that the result of the standard deviation calculation of experiment class was 14.691 and the result of the standard error calculation of experiment class was 2.728. Meanwhile, the result of the standard deviation calculation of control class was 10.461 and the result of the standard error calculation of control class was 1.943. Before, the writer examined the hypothesis; the writer calculated the standard error of mean of difference. The writer used the formula as follow:

$$\begin{aligned}
 SEM1 - SEM2 &= \sqrt{SEM1^2 + SEM2^2} \\
 &= \sqrt{2.728^2 + 1.943^2} \\
 &= \sqrt{7.441984 + 3.775249} \\
 &= \sqrt{11.217233} \\
 &= 3.3492137883 = 3.349
 \end{aligned}$$

Then, to examine the hypothesis, the writer used the formula as follow:

$$\begin{aligned}
 t_o &= \frac{M1 - M2}{SEM1 - SEM2} \\
 &= \frac{63.9 - 46.1}{3.349}
 \end{aligned}$$

$$= \frac{17.8}{3.349}$$

$$= 5.315$$

Next, the writer accounted degree of freedom (df) with the formula as follow:

$$df = (N1 + N2 - 2)$$

$$= (30 + 30 - 2)$$

$$= 58$$

After that, the writer interpreted the result of t test. To know the hypothesis was accepted or rejected using the criterion as follow:

If  $t\text{-test} \geq t_{\text{table}}$ , it meant  $H_a$  was accepted and  $H_o$  was rejected.

If  $t\text{-test} \leq t_{\text{table}}$ , it meant  $H_a$  was rejected and  $H_o$  was accepted.

The next step, the writer tabulated the result of the t test calculation into table 4.2 as follows:

**Table 4.2 The Result of T Test Using Manual Calculation**

T Observed	T table		Df
	5%	1%	
5.315	2.00	2.65	58

Based on the table above, it could be seen that the result of t test using manual calculation was 5.315 and the result of degree of freedom (df) calculation was 58. Then the result of t test was interpreted on the result of degree of freedom to get value of the  $t_{table}$ . It was found that  $t_{observed}$  was higher than  $t_{table}$  at 5% and 1% significance level ( $2.00 < 5.315 > 2.65$ ). It meant  $H_a$  was accepted and  $H_o$  was rejected. It showed that teaching vocabulary using mnemonic device gave effect on vocabulary learning at the second grade students at MTsNMaliku.

#### **D. DISCUSSION**

The result of analysis showed that there was significant effect of using mnemonic toward the students' vocabulary of the eighth grade students at MTsNMaliku. The students who were taught using mnemonic reached higher score than those who were taught without using mnemonic.

Meanwhile, after the data was calculated using  $t_{test}$ , it was found that the value of  $t_{test}$  was higher than  $t_{table}$  at manual calculation was 5.315 and the result of degree of freedom (df) calculation was 58. Then the result of t test was interpreted on the result of degree of freedom to get value of the  $t_{table}$ . It was found that  $t_{observed}$  was higher than  $t_{table}$  at 5% and 1% significance level ( $2.00 < 5.315 > 2.65$ ). It meant  $H_a$  was accepted and  $H_o$  was rejected. It showed that teaching vocabulary using mnemonic device gave effect on vocabulary learning at the second grade students at MTsNMaliku.

Based on the result the data analysis showed that using mnemonic gave significance effect for the students' vocabulary scores at MTsNMaliku. After the students have been taught by mnemonic, the vocabulary score were higher than before implementing mnemonic as strategy for teaching. It can be seen in the comparison of pre test and post test score of experimental class and control class. This finding indicated that mnemonic is effective and supports the first previous research done by Amir Yousefi, A lot of studies have focused on the recognition and instruction of language learning strategies in general and vocabulary in particular. There are, however, a few studies done on mnemonic devices. Those focused on mnemonic devices have consistently indicated that the use of mnemonic devices substantially enhances higher levels of retention in immediate and delayed recall of second language vocabulary words in comparison with other learning strategies. For example, Raugh and Atkinson (1975) compared the keyword method with various control procedures for learning a Spanish vocabulary. In all cases, the keyword method proved to be highly effective, yielding in one experiment a final test score of 88% correct for the keyword group compared to 28% for the control group. The results showed that students who used the keyword method remembered more vocabulary than students who were not instructed in keyword method usage. Carlson, Kincaid, Lance, and Hodgson (1976), however, found significantly better recall when a group trained on the method of loci was compared to a control group. Another study by Roediger (1980) looked at the method of loci along with three other well-known mnemonic methods. Results of the study revealed that all four



mnemonic groups recalled the 20-word list better than the control group. However, the method of loci and the peg word system were found to be better methods to use when the order of words remembered was important. Erten and Tekin (2008) investigated the effects of semantic organization on vocabulary recall on a group of 60 fourth graders. They were taught 80 carefully selected words either in semantically related sets or semantically unrelated set. The statistical analysis, however, revealed that learning words in semantically unrelated sets yields better results than learning vocabulary in semantically related sets. The study indicated that, contrary to frequent practice in many course books, presenting new vocabulary that belongs to the same semantic set together may cause interference due to cross-association and may even hinder vocabulary learning. Atay and Ozbulgan (2007) investigated the effects of memory strategy instruction along with learning through context on the ESP vocabulary recall of Turkish EFL learners. The study showed that memory strategies or mnemonic strategies can improve vocabulary learning. The result of the study also illustrated that first; strategy instruction should be integrated into contextual vocabulary learning. After discovering the meaning of a word through different contexts, students should be guided to recall it via different memory strategies. Secondly, rather than providing the learners with one or two strategies, the instruction should focus on the whole array of strategies, and students should be asked to choose the most effective one(s) for themselves. To do so teachers should be instructed about the use and instruction of different strategies.

Then finding indicated that mnemonic is effective and supports the second previous research done by GhaffarTajalli, Based upon the results yielded in the study several conclusions are drawn. The overall aim of the present study was to assess whether using mnemonic associations was effective in classroom setting and whether it was suitable for practical use by students as a learning strategy. The data analyzed revealed that using mnemonic associations led to significantly better performance of the adult students when comparison was made with respect to an external control group (rote group) and better performance of both adult and adolescent groups when comparison was made with respect to an internal control group (when students used no association in mnemonic group). Furthermore, the higher performance of mnemonic groups who frequently reported using initial associations revealed that initial associations had a significant role at vocabulary recall of students. According to these findings the mnemonic-based methods may turn out to be useful for different age groups. As it was noted earlier, the most common method of associative mnemonic links is mnemonic keyword method coined by Atkinson (1975). It is used to make meaningful auditory and imagery links to remember a word. Since the keyword method is typically thought of as an imagery technique, one might expect that some kind of individual imagery ability and the quality of keyword image would be quite important for better performance of the students. Individual differences in visual imagery are predicted within dual coding theory in which people are seen to vary in their tendency and capacity to use imagery (Clark & Paivio, 1991). In sum, there are some words and

some individuals for whom the keyword method will work less well than for others. It is obviously important to know for what specific items and learners the keyword method is best suited.

It can be seen in the comparison of pre test and post test score of experimental class and control class. This finding indicated that mnemonic is effective and supports the third previous research done by Ahmad Safa, The inter relationship between vocabulary learning and the second or foreign language learning process is undeniable and the positive impact of rich vocabulary knowledge on the linguistic comprehension and production of the second or foreign language learners is unquestionable. The literature of second language development studies abounds with an increasing number of researches that have put the vocabulary teaching and learning in the spotlight and tried to introduce innovative and efficient techniques for the lexical development of second language learners. Mnemonic key word method of vocabulary instruction, despite its promising perspective at the outset of introduction, has not received the deserving attention in practice and hence has not flourished although many studies have underscored its merits as an effective educational technique. In an attempt to revive the attention and investigate the effects of mnemonic keyword method on vocabulary learning and especially long term retention of the learnt

Vocabulary items, the present study compared this method with vocabulary instruction based on the classic memorization practices in their effects on true beginner EFL learners' vocabulary learning in a classroom context. The results of

the study indicated that using key word method can help students learn vocabulary more effectively and retrieve the learnt vocabulary items much more efficiently than other methods like rote memorization. As the results revealed, the participants in the key word method significantly outperformed the rote memorization group's participants in both of the two delayed tests.

Mnemonic is effective in terms of improving the students' English vocabulary achievement. It can be seen from the improvement of the students' average in the post test. From the mean score of control and experiment were 63.9 and 46.1. It indicated the difference of the students' achievement after getting treatment. In line that using mnemonic as strategy is effective in enhance their vocabulary motivation and encourage them to form a habit of regular vocabulary.