

CHAPTER IV

THE RESULT AND DISCUSSION

A. Description of Data

In this chapter, the researcher explains the result of the research to describe the effectiveness of using problem based learning in enhancing students' reading comprehension. The researcher attempt to submit the data as outcomes of research has conducted at MAN 2 Kabupaten serang. In this research, the researcher used pre-test and post-test design. the aim of the test as an instrument used by researcher is to know the students' reading comprehension. This research used multiple choices, analyze grammatical wrong in the text and essay test. The researcher gave a pre-test before treatment and post-test after treatment to find whether or not significant change in students' reading comprehension using problem based learning method. The researcher used quasi experiment research.

The researcher took 50 students as a subject in this research. It is divided in two classes. They are 25 students from class X MIA as the experiment class and 25 students from class X IIS as a control class. The researcher got the data used test as instrument, the first is result of pre-test and the second is result of post-test.

The result of pre-test in experiment class is named variable (X1) while the result of post-test in experiment class is named variable (X2), the result of pre-test in control class is named variable (Y1) and the result of post-test is named variable (Y2).

The students' reading comprehension at the eleventh grade of MAN 2 Kabupaten Serang has less before using problem based learning method.

They found difficulties to understand the meaning of passages and less of vocabulary, the more of students lazy to read the text. But after using problem based learning, students have better achievement. It can be seen for the result of pre-test and post-test.

To know the result of the test, the researcher explains the process of experiment score and control score as follow:

1. The process of Experimental Class

To know the effectiveness of problem based learning in enhancing students' reading comprehension, the researcher gave the test to students. The test uses in this research divided in two types, there are pre-test and post-test. Pre-test was the test that given before treatment and post-test given after giving treatment.

This is the result of score pre-test and post-test of experiment class. The score of in this test would be describing in table.

Table 4.1
The students' score of the pre-test at the experimental class

No	Name of Students	Criteria			Score
		Multiple Choices	Analysis	Essay	
1	Du	5	16	30	51
2	Ha	6	8	35	49
3	HH	7	32	30	69
4	DF	6	24	25	55
5	ES	6	20	30	56
6	DAA	7	28	30	65
7	FAR	6	20	35	61
8	AS	7	32	30	69
9	LK	6	16	35	57
10	LS	5	24	30	59
11	LPM	7	28	30	65
12	Mu	7	20	35	62
13	Nu	7	20	25	52
14	Nu	7	20	35	62
15	NEY	8	28	40	76
16	Re	5	20	45	70
17	RR	5	20	40	65
18	RFP	7	28	48	83
19	Su	6	36	30	72
20	SM	8	20	40	68
21	SM	5	20	35	60

22	SM	6	28	45	79
23	SL	6	36	40	82
24	SN	8	28	45	81
25	SNH	8	32	40	80
Total Score		1.648			
Average		65,9			

The table above showed the students' pre-test of experiment class. Pre-test was given in the first meeting before giving any treatment. According to table of experiment class, it can be seen the lowest score of ore-test is 51 and the higher score is 83. The total score is 1.648. So, the average score of pre-test was 65,9. While the result of post-test at the experimental class got better score than pre-test. It can be described as follow:

Table 4.2
The students' score of the post-test at the experimental class

No	Name of Students	Criteria			Score
		Multiple Choices	Analysis	Essay	
1	Du	8	32	50	90
2	Ha	9	36	35	80
3	HH	9	36	45	90
4	DF	8	36	45	89
5	ES	7	28	45	80
6	DAA	9	36	45	90
7	FAR	7	28	45	80
8	AS	7	32	42	81
9	LK	9	32	45	86
10	LS	7	32	35	74
11	LPM	8	32	45	85
12	Mu	8	40	45	93
13	Nu	8	36	48	92
14	Nu	8	32	48	88
15	NEY	9	32	45	86
16	Re	7	32	45	84
17	RR	7	32	42	81
18	RFP	8	32	50	90
19	Su	7	40	45	92
20	SM	8	28	45	81
21	SM	9	28	45	82
22	SM	7	32	45	84

23	SL	7	36	45	88
24	SN	9	32	48	89
25	SNH	9	32	45	86
Total Score		2.141			
Average		85,6			

The table above showed the students' post-test of experiment class. Post-test was given after giving treatment. According to table of experiment class, it can be seen the lowest score of post-test is 74 and the higher score is 93. The total score is 2.141. So, the average score of post-test was 85,6.

Based on the explanation above, it showed the result from post-test at experimental class was greatly improved after giving treatment, the result was better than the pre-test (before giving the treatment). It is seen from the average between the post-test and pre-test. Average of post-test was better than the average of pre-test, that's $65,9 < 85,6$.

2. The Process of Control Class

Same with experiment class, in control class the researcher also gave the test to students. There are pre-test and post-test. But the different with experiment class, control class in treatment not taught problem based learning method only taught conventionally.

This is the result of score pre-test and post-test pf control class. The score of in this test would be describing in table.

Table 4.3
The students' score of the pre-test at the control class

No	Name of Students	Criteria			Score
		Multiple Choices	Analysis	Essay	
1	Ad	5	4	35	44
2	AL	7	16	50	73
3	AR	9	16	50	75
4	De	8	28	35	71
5	DP	4	16	30	50
6	Ii	6	24	35	65
7	Ka	3	24	25	52
8	Ne	5	16	40	61
9	Na	8	16	40	64
10	NI	5	28	25	58
11	NPK	3	24	35	62
12	Ri	5	20	35	60
13	Ra	5	8	35	48
14	Re	7	16	45	68
15	Su	5	8	30	43
16	SJ	4	24	35	63
17	SN	2	16	30	48
18	SN	6	16	30	52
19	SH	4	24	25	53
20	SL	4	24	35	63
21	SR	5	8	25	38
22	TR	7	16	30	53

23	Ut	3	24	30	57
24	VHS	5	24	30	59
25	TS	6	32	30	68
Total Score		1.499			
Average		59,9			

The table above shows the students' pre-test of control class was less because in this class not use treatment. It can be seen from the result and pre-test and post-test. The lowest score of pre-test is 38 and the highest score is 75. The total score is 1.499.

Table 4.4
The students' score of the post-test at the control class

No	Name of Students	Criteria			Score
		Multiple Choices	Analysis	Essay	
1	As	6	4	35	45
2	AL	7	16	45	68
3	AR	9	24	45	78
4	De	9	28	35	72
5	DP	6	36	35	77
6	Ii	7	24	35	66
7	Ku	5	24	30	64
8	Ne	3	36	40	79
9	Na	9	16	40	65
10	NI	7	28	30	65
11	NPK	8	24	40	72
12	Ri	7	20	35	62
13	Ra	5	16	35	56
14	Re	8	32	40	80
15	Su	5	8	35	48
16	SJ	5	24	35	64
17	SN	5	16	30	51
18	SN	6	24	45	75
19	SH	6	28	35	69
20	SL	5	24	35	64
21	SR	5	16	25	46
22	TR	8	16	30	54
23	Ut	5	24	30	59

24	VHS	5	24	30	59
25	TS	7	32	30	69
Total Score		1.573			
Average		62,9			

The table above shows the students' post-test of control class was less than experiment class, because in this class not use treatment. It can be seen from the result and pre-test and post-test. The lowest score of post-test is 45 and the highest score is 80. The total score is 1.573.

Based on the explanation above, it showed the result from post-test at experiment class was greatly improved after giving treatment, the result was better than the pre-test (before giving the treatment). It is seen from the average between the post-test and pre-test. Average of post-test was better than the average of pre-test, that's $65,9 < 85,6$.

B. Data Analysis

After giving the data from pre-test and post-test score of two classes then the writing analyzed it by using t-test formula with the degree of significant 5% and 1%, formula as follow:

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

t_o = Nilai "t" yang di cari

M_i = The average score of experiment class

M_2 = The average score of controlclass

$SE_{M_1 - M_2}$ = Standar error rata-rata

X = Sum of the squared deviation score of Experiment class

Y = Sum of the squared deviation score of Control class

To find out the comparison score of pre-test and post-test of experiment and control class. The score in this test would be describing in table.

Table 4.5**The different score between pre-test and post-test at experiment class**

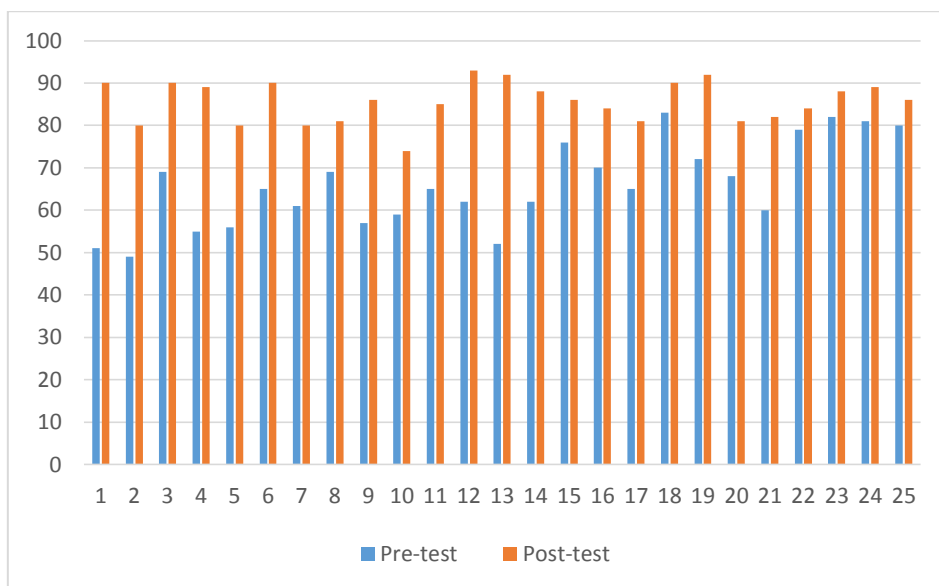
No	Name	Pre-test X_1	Post-test X_2	Deviation ($X=X_2-X_1$)	Squarred Deviation X^2
1	Du	51	90	39	1.521
2	Ha	49	80	31	961
3	HH	69	90	21	441
4	DF	55	89	34	1.156
5	ES	56	80	24	576
6	DAA	65	90	25	625
7	FAR	61	80	19	361
8	AS	69	81	12	144
9	LK	57	86	29	841
10	LS	59	74	15	225
11	LPM	65	85	20	400
12	Mu	62	93	31	961
13	Nu	52	92	40	1.600
14	Nu	62	88	26	676
15	NEY	76	86	10	100
16	Re	70	84	14	196

17	RR	65	81	16	256
18	RFP	83	90	7	49
19	Su	72	92	20	400
20	SM	68	81	13	169
21	SM	60	82	22	484
22	SM	79	84	5	25
23	SL	82	88	6	36
24	SN	81	89	8	64
25	SNH	80	86	6	36
Total		$\sum X_1 =$ 1.648	$\sum X_2 =$ 2.141	$\sum X =$ 493	$\sum (X)^2 =$ 12.303

The data from table above presented into graphic. It has purpose to collect score between pre-test and post-test at the experiment class.

Graphic 4.1

The different score between pre-test and post-test at experiment class



Based on the graphic above showed that the score difference between pre-test and post-test at the experiment class. The difference score was the result from the post-test scores subtract pre-test score. There was significant difference score between pre-test and post-test at the experimental class, the biggest score was 39 and the lowest difference was 5.

Then, the researcher analysis the data by comparing students' score in pre-test and post-test in control class from the lower to the higher and explaining by the table as follow:

Table 4.6**The different score between pre-test and post-test at control class**

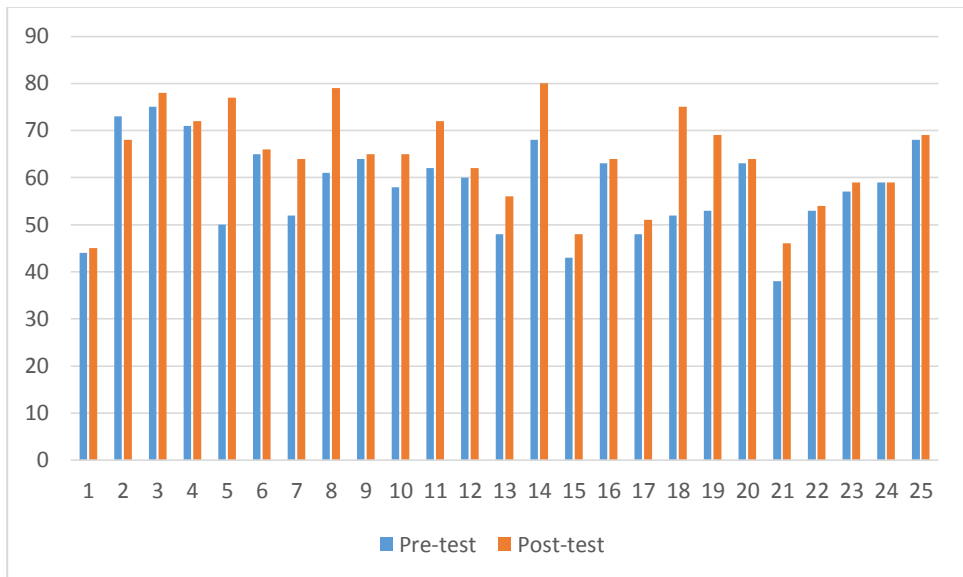
No	Name	Pre-test Y₁	Post-test Y₂	Deviation (Y=Y₂- Y₁)	Squarred Deviation (Y²)
1	As	44	45	1	1
2	AL	73	68	5	25
3	AR	75	78	3	9
4	De	71	72	1	1
5	DP	50	77	27	729
6	Ii	65	66	1	1
7	Ku	52	64	12	144
8	Ne	61	79	18	324
9	Na	64	65	1	1
10	NI	58	65	7	49
11	NPK	62	72	10	100
12	Ri	60	62	2	4
13	Ra	48	56	8	64
14	Re	68	80	12	144
15	Su	43	48	5	25
16	SJ	63	64	1	1

17	SN	48	51	3	9
18	SN	52	75	3	9
19	SH	53	69	16	256
20	SL	63	64	1	1
21	SR	38	46	8	64
22	TR	53	54	1	1
23	Ut	57	59	2	4
24	VHS	59	59	0	0
25	TS	68	69	1	1
Total		$\sum Y_1 =$ 1.448	$\sum Y_2 =$ 1.607	$\sum Y =$ 149	$\sum (Y)^2 =$ 1.967

The data from table above presented into graphic. It has purpose to collect score between pre-test and post-test at the control class.

Graphic 4.2

The different score between pre-test and post-test at control class



Based on the graphic above showed that the score difference between pre-test and post-test at the control class. The difference score was the result from the post-test scores subtract pre-test score. There was significant difference score between pre-test and post-test at the control class, the biggest score was 27 and the lowest difference was 0

From the data above, the researcher t-test calculated using the steps as follow:

1. Determine mean of score experiment class (MX), with formula as follow:

$$\begin{aligned}
 MX &= \frac{\sum X}{N} \\
 &= \frac{493}{25} \\
 &= 19,72
 \end{aligned}$$

the result above showed us about the average score (mean) at the experimental class. The researcher got the data from $\sum X_1$, $\sum X_2$, and $\sum X$. The researcher calculated the data based on the formula above.

2. Determine mean of control class (MY), with formula as follow:

$$\begin{aligned} MY &= \frac{\sum Y}{N} \\ &= \frac{149}{25} \\ &= 5,96 \end{aligned}$$

The result above showed us about the average score (mean) at the control class. The researcher got the data from $\sum Y_1$, $\sum Y_2$, and $\sum Y$. The researcher calculated the data based on the formula above.

3. Determine standard deviation score of experiment class (X^2), with formula as follow:

$$\begin{aligned} SD_x &= \sqrt{\frac{\sum X^2}{N}} \\ &= \frac{\sqrt{12.303}}{25} \\ &= \sqrt{492,12} \\ &= 22,18 \end{aligned}$$

The result above showed about standard deviation score at experiment class. The researcher got the data from $\sum X_1$, $\sum X_2$, $\sum X$ and $\sum (X)^2$. Afterword the researcher calculated the data based on the formula above.

4. Determine standard deviation score of control class (Y^2), with formula as follow:

$$SD_y = \sqrt{\frac{\sum Y^2}{N}}$$

$$\begin{aligned}
&= \frac{\sqrt{1.967}}{25} \\
&= \sqrt{78,68} \\
&= 8,87
\end{aligned}$$

The result above showed about standard deviation score at control class. The researcher got the data from $\sum Y_1$, $\sum Y_2$, $\sum Y$ and $\sum (Y)^2$. Afterword the researcher calculated the data based on the formula above.

5. Determine standard error of mean at experiment class (X) using the formula as follow:

$$\begin{aligned}
SE_{Mx} &= \frac{SD_x}{N-1} \\
&= \frac{22,18}{\sqrt{25-1}} \\
&= \frac{22,18}{\sqrt{24}} \\
&= \sqrt{0,92} \\
&= 0,95
\end{aligned}$$

The result above showed about standard error of mean at experiment class. The researcher got the data from standard deviation of experiment class (X Variable). Afterword the researcher calculated the data based on the formula above.

6. Determine standard error of mean at control class (Y) using the formula as follow:

$$\begin{aligned}
SE_{My} &= \frac{SD_y}{N-1} \\
&= \frac{8,87}{\sqrt{25-1}}
\end{aligned}$$

$$\begin{aligned}
&= \frac{8,87}{\sqrt{24}} \\
&= \sqrt{0,36} \\
&= 0,6
\end{aligned}$$

The result above showed about standard error of mean at control class. The researcher got the data from standard deviation of control class (Y Variable). Afterword the researcher calculated the data based on the formula above.

7. Determine standard error, difference of mean between variable X and variable Y. with the formula as follow:

$$\begin{aligned}
SE_{M_x - M_y} &= \sqrt{SE_{M_x}^2 + SE_{M_y}^2} \\
&= \sqrt{0,95^2 + 0,6^2} \\
&= \sqrt{0,9025 + 0,36} \\
&= \sqrt{1,2625} \\
&= 1,12
\end{aligned}$$

The result above showed about the differences standard error of mean between experiment class and control class. The researcher got the data from standard error of mean at experiment class and control class. Afterword the researcher calculated the data based on the formula above.

8. Determine value of “ t_o ” with using the formula as follow:

$$t_o = \frac{M_x - M_y}{SE_{M_x - M_y}}$$

$$\begin{aligned}
&= \frac{19,72 - 5,96}{0,95 - 0,6} \\
&= \frac{13,76}{0,35} \\
&= 39,3
\end{aligned}$$

The t-test value of 39,3 is called the t_{hitung} value. To determine the significant level of difference it should be used the t_{table} value contained in the table t_{table} values must be found first degree of freedom (df) by using formula:

$$\begin{aligned}
DF &= N_1 + N_2 - 2 \\
&= 25 + 25 - 2 \\
&= 50 - 2 \\
&= 48
\end{aligned}$$

Based on $df = 48$ in table t, with 5% significance level found t_{table} 1,67 and with 1% significance level found t_{table} 2,40. So the result is t_t is 5% $< t_o$, or $t_o > t_t$ 1%. It is mean that t_o (t observation) is higher than t_t (t table).

To know whether it is significant or not we have to look at the t table in appendix. The result of t_t on significant 5% = 1,67 and 1% = 2,40. It indicates that $t_o > t_t$ or $39,3 > 1,67$ and $39,3 > 2,40$ so the zero hypothesis are rejected and the alternative hypothesis is accepted. It means. There is a significant the effectiveness of students' reading comprehension.

C. Hypothesis testing

Before deciding the result of hypothesis the researcher purpose interpretation toward t_o (t observation) with procedure as follow:

1. H_a (Alternative Hypothesis): $t_{\text{observation}} \geq t_{\text{table}}$ it means there is significant difference between the effectiveness of using problem based learning method in enhancing students' reading comprehension at the eleventh grade at MAN 2 Kabupaten Serang.
2. H_o (Null Hypothesis): $t_{\text{observation}} \leq t_{\text{table}}$ it means there is no significant difference between the effectiveness of using problem based learning method in enhancing students' reading comprehension at the eleventh grade at MAN 2 Kabupaten Serang.

D. The interpretation of data

After got the data, the researcher compared it with both in degree of significant 5% and 1%; therefor based on "t" table that there is 48 with df as number 48 is got "t" table as follow: at significant level 5% $t_t = 1,67$ and at significant level 1% $= 2,40$. The researcher compared t_o and t_t that if $t_o > t_t$, H_a is accepted and H_o is rejected. If $t_o < t_t$, it means that H_o is accepted and H_a is rejected.

Based on the data, the value of t_o (t observation) is higher than t_t (t table) from significant 5% $t_{\text{observation}} = 39,3$ $t_{\text{table}} = 1,67$ or $t_{\text{observation}} 39,3 > 1,67$ and significant 1% $t_{\text{observation}} 39,3 > 2,40$ or $t_{\text{observation}} 39,3 > 2,40$, because " t_o " that the researcher got from the calculation is higher than t table both at significant 5% and 1%, so the hypothesis alternative (H_a) is accepted and H_o is rejected.

From the explanation above, the researcher said that the use of problem based learning method in enhancing students' reading comprehension that could be better and more enhance to make understood for students' reading comprehension rather than conventional method or direct instruction. This could be seen after comparing the score of pre-test (before using problem based learning method) and post-test (after using problem based learning method).

According to the data obtained from experiment and control class between the average score and t observation, the researcher summarizes that teaching reading using problem based learning method has significant effect toward students' reading comprehension. By using problem based learning method, students felt more critical and creative thinking and understood in read a text.

So the researcher can summarize that using problem based learning method in enhancing students' reading comprehension is better and more effective without using problem based learning method at the eleventh grade of MAN 2 Kabupaten Serang.

