CHAPTER IV
RESEARCH FINDINGS AND ANALYSIS

A. Description of the Result Research

To find out the difference between the students who were taught by *think pair share* and the students who were not taught by using *think pair share* on quantifier, especially in SMPN 23 Semarang the writer did an analysis of quantitative data. The data was obtained by giving test to the experimental class and control class after giving a different learning both classes.

The subjects of this research were divided into two classes. They are experimental class (VIII D), control class (VIII E) and try out class (VIII G) of SMPN 23 Semarang. Before items were given to the students, the writer gave try out test to analyze validity, reliability, difficulty level and also the discrimination power of each item. The writer prepared 25 items as the instrument of the test. Test was given before and after the students follow the learning process that was provided by the writer.

Before the activities were conducted, the writer determined the materials and lesson plan of learning. Learning in the experiment class used *think pair share*, while the control class without used *think pair share*.

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

B. The Data Analysis and Test of Hypothesis

1. The Data Analysis

a. The Data Analysis of Pre-Test Value of the Experimental class and the Control Class.

Table 3

The list of Pre-Test Value of

The Experimental and Control Classes

No	Code	Experiment	Code	Control
1	E-01	85	C-01	85
2	E-02	70	C-02	80
3	E-03	70	C-03	55
4	E-04	75	C-04	75
5	E-05	55	C-05	80
6	E-06	70	C-06	50
7	E-07	65	C-07	70
8	E-08	80	C-08	80
9	E-09	80	C-09	65
10	E-10	65	C-10	80
11	E-11	85	C-11	80
12	E-12	70	C-12	60
13	E-13	65	C-13	60
14	E-14	65	C-14	55
15	E-15	75	C-15	75
16	E-16	80	C-16	60
17	E-17	60	C-17	55
18	E-18	65	C-18	60
19	E-19	80	C-19	60
20	E-20	80	C-20	80
21	E-21	65	C-21	85
22	E-22	80	C-22	65
23	E-23	55	C-23	75
24	E-24	65	C-24	55
25	E-25	60	C-25	75
26	E-26	80	C-26	85
27	E-27	85	C-27	75
28	E-28	75	C-28	80
29	E-29	60	C-29	85
30	E-30	70	C-30	70
S	=	2135		2115
n_1	=	30		30
x_1	=	71,2		70,5
s_1^2	=	80,489		123,017
s_1	=	8,97		11,09

1) The Normality Pre-test of the Experimental Class

The normality test is used to know whether the data obtained is normally distributed or not. Based on the table above, the normality test:

Hypothesis:

Ha: The distribution list is normal.

Ho: The distribution list is not normal

Test of hypothesis:

The formula is used:

$$X^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i}$$

The computation of normality test:

Length of the class = 5,8745

Maximum score = 85

Minimum score = 50

K / Number of class = 7

Range = 35

Table 4

Distribution value of pre test of experiment class

Class	f_i	X_i	X_i^2	$f_i.X_i$	$f_i.X_i^2$
55 – 60	5	57,5	3306,3	287,5	16531
61 – 66	7	63,5	4032,3	444,5	28226
67 – 72	5	69,5	4830,3	347,5	24151
73 – 78	3	75,5	5700,3	226,5	17101
79 – 84	7	81,5	6642,3	570,5	46496
85 – 90	3	87,5	7656,3	262,5	22969
Total	30			2139	155474

$$\frac{\sum fixi}{\sum fi} = \frac{2139}{30} = 71.3$$

$$s^2 = \frac{n\sum fi.xi^2 - (\sum fixi)^2}{n(n-1)} = \frac{30*155474 - (2139)^2}{30(30-1)}$$

$s^2 = 102.166$

$s = 10.1077$

Table 5

Observation frequency value of pre test

Of experiment class

Class	Bk	Z_i	$P(Z_i)$	Sizes class	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
	0,50	-7,00	-0,500				
55 - 60				0,1426	4,2795	5	0,1213
	60,50	-1,07	-0,357				
61 - 66				0,1748	5,2436	7	0,5884
	66,50	-0,47	-0,183				
67 - 72				0,1353	4,0594	5	0,2179
	72,50	0,12	0,047				
73 - 78				0,2146	6,4385	3	1,8364
	78,50	0,71	0,262				
79 - 84				0,1423	4,2703	7	1,7449
	84,50	1,31	0,404				
85 - 90				0,0670	2,0112	3	0,4861
	90,50	1,90	0,471				
						X^2 =	4,9950

With α = 5% and dk = 6-3 = 3, from the chi-square distribution table, obtained X_{table} = 7,81. Because X^2_{count} is lower than X^2_{table} (4,9950<7,81). So, the distribution list is normal.

2) The Normality Pre-Test of the Control Class

Hypothesis :

Ho: The distribution list is normal.

Ha: The distribution list is not normal.

Test of hypothesis:

The formula is used:

: $\chi^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i}$

The computation of normality test:

Maximum score = 85

Length of the class = 6, 14286

Minimum score = 55

Range = 30

K/ Number of class = 5.875

Table 6

Distribution value of pre test of control class

Class	f_i	X_i	X_i^2	$f_i.X_i$	$f_i.X_i^2$
50 – 56	5	53	2809	265	14045
57 – 63	5	60	3600	300	18000
64 – 70	4	67	4489	268	17956
71 – 77	5	74	5476	370	27380
78 – 84	7	81	6561	567	45927
85 – 91	4	88	7744	352	30976
Jumlah	30		30679	2122	154284

$$\overline{X} = \frac{\sum fixi}{\sum fi} = \frac{2122}{30} = 70.7333$$

$$s^2 = \frac{n\sum fi.xi^2 - (\sum fixi)^2}{n(n-1)} = \frac{30 * 154284 - (2122)^2}{30(30-1)}$$

$s^2 = 144.409$

$s = 12.017$

Table 7

Observation frequency value of pre test

Of control class

Class	Bk	Z_i	$P(Z_i)$	Sizes class	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
	49,50	-1,77	-0,461				
50 - 56				0,0795	2,3851	5	2,8670
	56,50	-1,18	-0,382				
57 - 63				0,1555	4,6647	5	0,0241
	63,50	-0,60	-0,226				
64 - 70				0,2186	6,5592	4	0,9986
	70,50	-0,02	-0,008				
71 - 77				0,2056	6,1670	5	0,2208
	77,50	0,56	0,213				

78 - 84					0,1607	4,8212	7	0,9847
	84,50	1,15	0,374					
85 - 91					0,0840	2,5199	4	0,8694
	91,50	1,73	0,458					
						χ^2_{hitung}	=	5,9645

With α = 5% and dk = 6-3 = 3, from the chi-square distribution table, obtained X_{table} = 7,81. Because X^2_{count} is lower than X^2_{table} (5,9645<7,81). So, the distribution list is normal.

3) The Homogeneity Pre-Test of the Experimental Class

Hypothesis :

$H_o : \sigma_1^2 = \sigma_2^2$

$H_A : \sigma_1^2 \neq \sigma_2^2$

Test of hypothesis:

The formula is used:

$$S^2 = \frac{\sum (n_i - 1) Si^2}{\sum (n_i - 1)}$$

The Data of the research:

Variant	Experiment	Control
Total	2135	2115
n	30	30
$\overline{X}$	71.17	70.50
Variant (S^2)	80.489	123.017
Standard deviasi (S)	8.97	11.09

Tabel Uji Bartlet

Sampel	dk	1/dk	S_i^2	Log S_i^2	dk.Log S_i^2	dk * Si^2
1	29,00	0,0345	80,489	1,906	55,266	2334,167
2	29,00	0,0345	123,017	2,090	60,609	3567,500
Jumlah	58				115,875	5901,667

Based on the formula, it is obtained:

$$S^2 = \frac{\sum (n_i - 1) Si^2}{\sum (n_i - 1)}$$

$$S^2 = \frac{5901.667}{58}$$

= 101.7528736

B = (log S^2) S ($n_i - 1$)

B = 2.0007546683 58

B = 116.4377076

X^2_{hitung} = (Ln 10) { B - S(ni-1) log Si^2 }

X^2_{hitung} = 2.302585093{116.4377076-115.875}

X^2_{hitung} = 1.295001462

With α = 5% and dk = (2-1 = 1) obtained X^2_{table} = 3,84 Because X_{count} is lower than X_{table} (1,295 < 3, 84). So, Ho is accepted and the two groups have same variant / homogeneous.

4) The average of similarity Test of Pre-Test of Experimental and Control Classes.

Hypothesis:

Ho: $\mu_1 = \mu_2$

Ha: $\mu_1 \neq \mu_2$

Test of hypothesis:

Based on the computation of the homogeneity test, the experimental class and control class have same variant. So, the t-test formula:

$$t = \frac{\overline{x_1} - \overline{x_2}}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \qquad S = \sqrt{\frac{(n_1 - 1)S_1^{\,2} + (n_2 - 1)S_2^{\,2}}{n_1 + n_2 - 2}}$$

The data of the research:

Variant	Experiment	Control
Total	2135	2115
n	30	30
$\overline{X}$	71.167	70.500
Variant (S^2)	80.489	123.017
Standard deviasi (S)	8.972	11.091

$$S = \sqrt{\frac{(n_1 - 1)S_1^{\,2} + (n_2 - 1)S_2^{\,2}}{n_1 + n_2 - 2}}$$

$$S = \sqrt{\frac{(30-1)80.489 + (30-1)123.017}{30+30-2}} = 10.087$$

So, the computation t-test:

$$t = \frac{\overline{x_1} - \overline{x_2}}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = 10.087 \frac{71.167 - 70.500}{9{,}23525\sqrt{\frac{1}{30} + \frac{1}{30}}} = 0.256$$

With α = 5% and dk = 30 + 30– 2 = 58, obtained t_{table} = 1,67. Because t_{count} is lower than t_{table} (0.256< 1,67). So, Ho is accepted and there is no difference of the pre test average value from both groups.

b. The Data Analysis of Post-Test Scores in Experimental Class and Control Class.

Table 8

The List of the Post Test Value of the Experimental And Control Classes

No	Code	Experiment class	Code	Controll class
1	E-01	70	Code	60
2	E-02	85	C-01	60
3	E-03	85	C-02	65
4	E-04	75	C-03	50
5	E-05	80	C-04	60
6	E-06	85	C-05	60
7	E-07	80	C-06	65
8	E-08	75	C-07	55
9	E-09	80	C-08	50
10	E-10	70	C-09	60
11	E-11	85	C-10	55
12	E-12	75	C-11	60
13	E-13	80	C-12	75
14	E-14	85	C-13	50
15	E-15	85	C-14	85
16	E-16	90	C-15	85
17	E-17	70	C-16	80
18	E-18	65	C-17	75
19	E-19	65	C-18	75
20	E-20	80	C-19	80
21	E-21	85	C-20	60

22	E-22	85	C-21	80
23	E-23	70	C-22	75
24	E-24	75	C-23	80
25	E-25	60	C-24	70
26	E-26	80	C-25	80
27	E-27	60	C-26	65
28	E-28	80	C-27	80
29	E-29	90	C-28	85
30	E-30	80	C-29	60
S	=	2330		2040
n_1	=	30		30
x_1	=	77,7		68,0
s_1^2	=	68,506		130,345
s_1	=	8,28		11,42

1) The Normality Post-Test of the Experimental Class

Based on the table above, the normality test:

Hypothesis :

Ho : The distribution list is normal.

Ha : The distribution list is not normal.

Test of hypothesis:

The formula is used:

$$\chi^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i}$$

The computation of normality test:

Maximum score = 90

Length of the class = 5.875

Range = 30

Minimum score = 60

K/ Number of class = 6

Table 9

Distribution value Post Test of the Experimental Class

Class			f_i	X_i	X_i^2	$f_i.X_i$	$f_i.X_i^2$
60	–	65	4	62,5	3906,3	250	15625
66	–	71	4	68,5	4692,3	274	18769
72	–	77	4	74,5	5550,3	298	22201
78	–	83	8	80,5	6480,3	644	51842
84	–	89	8	86,5	7482,3	692	59858
90	–	95	2	92,5	8556,3	185	17113

Total	30			2343	185408

$$\overline{X} = \frac{\sum fixi}{\sum fi} = \frac{2343}{30} = 78{,}1$$

$$s^2 = \frac{n\sum fi.xi^2 - (\sum fixi)^2}{n(n-1)} = \frac{30*185408 - (2343)^2}{30(30-1)}$$

$s^2 = 83{,}4207$
$s = 9{,}13349$

Table 10

Observation frequency value of post test

Of experiment class

Class	Bk	Z_i	$P(Z_i)$	Sizes class	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
	0.50	-8.50	-0.500				
60 - 65				0.0839	2.5159	4	0.8754
	65.50	-1.38	-0.416				
66 - 71				0.1511	4.5328	4	0.0626
	71.50	-0.72	-0.265				
72 - 77				0.2389	7.1656	4	1.3985
	77.50	-0.07	-0.026				
78 - 83				0.1966	5.8989	8	0.7484
	83.50	0.59	0.223				
84 - 89				0.1712	5.1359	8	1.5973
	89.50	1.25	0.394				
90 - 95				0.0776	2.3281	2	0.0462
	95.50	1.91	0.472				
						X^2 =	4.7284

With α = 5% and dk = 6-3 = 3, from the chi-square distribution table, obtained X_{table} = 7,81. Because X^2_{count} is lower than X^2_{table} (4.7284<7,81). So, the distribution list is normal.

2) The Normality Post-Test of the Control Class

Hypothesis: Ho : The distribution list is normal

Ha : The distribution list is not normal

Test of hypothesis:

The formula is used:

$$\chi^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i}$$

The computation of normality test:

Maximum score = 85

Length of the class = 5,8475

Minimum score = 50

Range = 35

K/many class interval = 6

Table 11

Distribution value of post test of control class

Class	f_i	X_i	X_i^2	$f_i.X_i$	$f_i.X_i^2$
50 – 56	5	53	2809	265	14045
57 – 63	8	60	3600	480	28800
64 – 70	4	67	4489	268	17956
71 – 77	4	74	5476	296	21904
78 – 84	6	81	6561	486	39366
85 – 91	3	88	7744	264	23232
Total	30		30679	2059	145303

$$\overline{X} = \frac{\sum fixi}{\sum fi} = \frac{2059}{30} = 68{,}6333$$

$$s^2 = \frac{n\sum fi.xi^2 - (\sum fixi)^2}{n(n-1)} = \frac{30*145303 - (2059)^2}{30(30-1)}$$

$s^2 = 137{,}482$

$s = 11{,}7253$

Table 12
Observation frequency value of post test
Of control class

Kelas	Bk	Z_i	$P(Z_i)$	Luas Daerah	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
	49,50	-1,63	-0,449				
50 - 56				0,0990	2,9706	5	1,3864

		56,50	-1,03	-0,350				
57	- 63				0,1804	5,4115	8	1,2381
		63,50	-0,44	-0,169				
64	- 70				0,1060	3,1797	4	0,2116
		70,50	0,16	0,063				
71	- 77				0,2120	6,3597	4	0,8756
		77,50	0,76	0,275				
78	- 84				0,1368	4,1031	6	0,8770
		84,50	1,35	0,412				
85	- 91				0,0624	1,8726	3	0,6788
		91,50	1,95	0,474				
						χ^2_{hitung}	=	5,2675

With α = 5% and dk = 6-3 = 3, from the chi-square distribution table, obtained X_{table} = 7,81. Because X^2_{count} is lower than X^2_{table} (5,2675< 7,81). So, the distribution list is normal.

3) The Homogeneity Post-Test of the Experimental Class

Hypothesis :

$H_o : \sigma_1^2 = \sigma_2^2$

$H_A : \sigma_1^2 \neq \sigma_2^2$

Test of hypothesis:

The formula is used:

$$S^2 = \frac{\sum (n_i - 1) Si^2}{\sum (n_i - 1)}$$

The Data of the research:

Variant	Experiment	Control
Total	2330	2040
n	30	30
$\overline{X}$	77.67	68.00
Variant (S^2)	68.506	130.345
Standard deviasi (S)	8.28	11.42

The Table of Bartlet Test

Sampel	dk	1/dk	S_i^2	Log S_i^2	dk.Log S_i^2	dk * Si^2
1	29,00	0,0345	68,506	1,836	53,236	1986,667
2	29,00	0,0345	130,345	2,115	61,338	3780,000
Jumlah	58				114,574	5766,667

$$S^2 = \frac{\sum (n_i - 1) Si^2}{\sum (n_i - 1)}$$

$$S^2 = \frac{5766,667}{58} = 99,42528736$$

B = (log S^2) S ($n_i - 1$)

B = 1,997496855 58

B = 115,8548176

X^2_{count} = (Ln 10) { B - S(ni-1) log Si^2 }

X^2_{count} = 2.302585093{115,8548176-114,574}

X^2_{count} = 2,949644013

With α = 5% and dk = (2-1=1), obtained X^2_{table} = 3,84. Because X^2_{count} is lower than X^2_{table} (2,95 < 3,84). So, Ho is accepted and the two groups have same variant/ homogeneous.

2. The Hypothesis Test

The hypotheses in this research is a significance difference in grammar test score between students taught using *think pair share* and those taught using non- *think pair share.*

In this research, because $\sigma_1^2 = \sigma_2^2$ (has same variant), the t-test formula is as follows:

$$t = \frac{\overline{x_1} - \overline{x_2}}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \qquad S = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

The data of the research:

Variant	Experimental	Controll
Total	2330	2040
N	30	30
X	77.667	68.000
Varian (S^2)	68.506	130.345
standart deviasi	8.28	11.42

$$S = \sqrt{\frac{(n_1 - 1)S_1^{\ 2} + (n_2 - 1)S_2^{\ 2}}{n_1 + n_2 - 2}}$$

$$S = \sqrt{\frac{(30-1).68{,}506 + (30-1)130{,}345}{30+30-2}} = 10.087$$

So, the computation t-test:

$$t = \frac{\overline{x_1} - \overline{x_2}}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = \frac{77{,}667 - 68{,}000}{9{,}971\sqrt{\frac{1}{30} + \frac{1}{30}}} = 3.755$$

With α = 5% and dk = 30+30-2 = 58, obtained t_{table} = 1,67 Because t_{count} is lower than t_{table} (1.67 < 3.755). So, Ho is accepted and there is no difference of the pre test average value from both groups.

From the computation above, the t-table is 1.67 by 5% alpha level of significance and dk = 30+30-2=58. T-value was 3.755. So, the t-value was higher than the critical value on the table (3.755 > 1.67).

From the result, it can be concluded that using *think pair share* is more effective than without using *think pair share* in teaching quantifier. The hypothesis is accepted.

C. Discussion of Research Finding

The result of the research shows that the experimental class (the students who are taught using *think pair share*) has the mean value pre-test was 71.167 and post-test was 77.667. While the control class (the students

who are taught without using *think pair share*) has the mean value pre-test was 70.500 and post-test was 68.000.

On the other hand, the test of hypothesis using t-test formula shows the value of the t-test is higher than the critical value. The value of t-test is 3.755, while the critical value on $t_{s0,05}$ is 2,00. It means that using *think pair share* more effective than without using *think pair share* in teaching quantifier.

D. Limitation of the Research

The writer realizes that this research had not been done optimally. There were constraints and obstacles faced during the research process. Some limitations of this research are:

1. Relative short time of research makes this research could not be done maximum.
2. The research is limited at SMP N 23 Semarang. So that when the same research will be gone in other schools, it is still possible to get different result.
3. The implementation of the research process was less perfect. Because short time of this research, so the assessment was conducted not only based on the material given in the class but also the assignments or exercises given to students' homework.

Considering all those limitations, there is a need to do more research about teaching quantifier using *think pair share*. So that, the more optimal result will be gained.