CHAPTER IV
RESEARCH FINDINGS AND DISCUSSION

A. Description of the Result Research

To find out the effectiveness of pictionary game, between the students who were taught by using pictionary game and the students who were not taught by using pictionary game on concrete nouns, especially in SDN 01 Donowangun the researcher 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 (IV A) and control class (IV B) of SDN 01 Donowangun. Test was given before and after the students follow the learning process that was provided by the researcher.

Before the activities were conducted, the researcher determined the materials and lesson plan of learning. Learning in the experiment class used pictionary game, while the control class without used pictionary game.

After the data were collected, the researcher 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 1

The list of Pre-Test Value of

The Experimental and Control Classes

No	code	Pre Test		code	Post Test	
		control	experiment		control	experiment
1	E-01	40	40	K-01	67	67
2	E-02	48	52	K-02	67	77
3	E-03	64	60	K-03	70	83
4	E-04	68	60	K-04	81	90
5	E-05	44	52	K-05	75	77
6	E-06	52	44	K-06	73	73
7	E-07	48	48	K-07	70	80
8	E-08	44	48	K-08	63	73
9	E-09	52	56	K-09	73	77
10	E-10	60	48	K-10	63	67
11	E-11	48	64	K-11	67	80
12	E-12	68	68	K-12	70	77
13	E-13	52	64	K-13	84	93
14	E-14	68	64	K-14	73	70
15	E-15	48	44	K-15	81	83
16	E-16	48	44	K-16	84	90
17	E-17	56	56	K-17	75	87
18	E-18	56	52	K-18	75	87
19	E-19	56	68	K-19	78	90
20	E-20	40	40	K-20	78	93
∑	=	**1060**	**1072**		**1467**	**1614**

N	=	**20**	**20**		**20**	**20**
X	=	**53**	**53.6**		**73.35**	**80.70**

Based on the table above were analyzed as follows:

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.

Data normality of Experimental Class:

Max. Score = 68

Min. Score = 40

R = 68- 40 = 28

K = 1+3.3 log 20 = 5.29 or 6

Class length = 28/6 = 4.67 or 5

$\overline{X}$ = 53.6

s^2 = 83.192

s = 9.121

Table 2

Observation frequency value of pre test

Of experiment class

Class interval	BK	Z_i	$P(Z_i)$	Size classes	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
40 -44	39.5	-1.60	0.4452	0.0921	1.842	4	2.52821064
45 - 49	44.5	-1.05	0.3531	0.1616	3.232	4	0.18249505
50 - 54	49.5	-0.50	0.1915	0.1676	3.352	3	0.0369642
55 - 59	54.5	0.06	0.0239	0.2052	4.104	2	1.07865887
60- 64	59.5	0.61	0.2291	0.1479	2.958	4	0.36706018
65 - 69	64.5	1.16	0.377	0.0794	1.588	3	1.2555063
	69.5	1.71	0.4564				
						X² =	5.44889523

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} (5.44889523<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:

Max. Score	= 68	
Min. Score	= 40	
R	= 68- 40	= 28
K	= 1+3.3 log 20	= 5.29 or 6
Class length	= 28/6	= 4.67 or 5

$\overline{X}$ = 53

s^2 = 78. 943

s = 8. 885

Table 3

Observation frequency value of pre test

Of control class

Class interval	BK	Z_i	$P(Z_i)$	Size classes	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
40 - 44	39.5	-1.54	0.4382	0.1042	2.084	4	1.761543186

45 - 49	44.5	-0.97	0.334	0.1786	3.572	5	0.570880179
50 - 54	49.5	-0.40	0.1554	0.0879	1.758	3	0.877453925
55- 59	54.5	0.17	0.0675	0.2029	4.058	3	0.275841301
60 - 64	59.5	0.74	0.2704	0.1345	2.69	2	0.176988848
65- 69	64.5	1.31	0.4049	0.065	1.3	3	2.223076923
	69.5	1.88	0.4699				
						X^2 =	5.885784362

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 $X^2{}_{table}$ (5.885784362<7.81). So, the distribution list is normal.

3) The Homogeneity Pre-Test of Experimental and Control Classes

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:

$$F = \frac{Biggest\ \mathrm{var}iant}{smallest\ \mathrm{var}iant}$$

The Data of the research:

Variant	Experimental Classes	Control Classes
Total	1072	1060
N	20	20
$\overline{X}$	53.6	53
Variant (S^2)	83. 192	78. 943
Standard deviasi (S)	9. 121	8. 885

Based on the formula, it is obtained:

$$F = \frac{83.192}{78.943} = 1.053$$

With α = 5% and dk = (20-1 = 19): (20-1 = 19), obtained F_{table} = 2.15. Because F_{count} is lower than F_{table} (1.053 < 2.15). 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:

$$t = \frac{\overline{x_1} - \overline{x_2}}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

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

The data of the research:

Variant	Experimental Classes	Control Classes
Total	1072	1060
n	20	20
$\overline{X}$	53.6	53
Variant (S^2)	83.192	78.943
Standard deviasi (S)	9.121	8.885

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

$$S = \sqrt{\frac{(20-1)83.193 + (20-1)78.943}{20 + 20 - 2}} = 9.0037$$

So, the computation t-test:

$$t = \frac{\overline{x_1} - \overline{x_2}}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = \frac{53.6 - 53}{9.0037\sqrt{\frac{1}{20} + \frac{1}{20}}} = 0.2107 = 0.211$$

With α = 5% and dk = 20 + 20– 2 = 38, obtained t_{table} = 1.68. Because t_{count} is lower than t_{table} (0.211 < 1.68). 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 Value in Experimental Class and Control Class.

Table 4

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

No	code	Pre Test		code	Post Test	
		control	experiment		control	experiment
1	E-01	40	40	K-01	67	67
2	E-02	48	52	K-02	67	77
3	E-03	64	60	K-03	70	83
4	E-04	68	60	K-04	81	90
5	E-05	44	52	K-05	75	77
6	E-06	52	44	K-06	73	73
7	E-07	48	48	K-07	70	80
8	E-08	44	48	K-08	63	73
9	E-09	52	56	K-09	73	77
10	E-10	60	48	K-10	63	67
11	E-11	48	64	K-11	67	80
12	E-12	68	68	K-12	70	77
13	E-13	52	64	K-13	84	93
14	E-14	68	64	K-14	73	70
15	E-15	48	44	K-15	81	83
16	E-16	48	44	K-16	84	90

17	E-17	56	56	K-17	75	87
18	E-18	56	52	K-18	75	87
19	E-19	56	68	K-19	78	90
20	E-20	40	40	K-20	78	93
∑	=	**1060**	**1072**		**1467**	**1614**
N	=	**20**	**20**		**20**	**20**
X	=	**53**	**53.6**		**73.35**	**80.70**

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:

   Max. Score = 93

   Min. Score = 67

   R = 93- 67 = 26

   K = 1+3.3 log 20 = 5.29 or 6

   Class length = 26/6 = 4.33 or 5

   $\overline{X}$ = 80.70

   s^2 = 69.2224

   s = 8.32

Table 5

Observation frequency value of post test

Of experiment class

Class interval	BK	Z_i	$P(Z_i)$	Size classes	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
67 – 71	66.5	-1.75	0.4599	0.0891	1.782	3	0.832505051
72–76	71.5	-1.13	0.3708	0.1758	3.516	2	0.653656428
77 – 81	76.5	-0.51	0.195	0.1512	3.024	6	2.928761905
82 – 86	81.5	0.11	0.0438	0.2204	4.408	2	1.315441016
87 – 91	86.5	0.72	0.2642	0.1457	2.914	5	1.493272478
92– 96	91.5	1.34	0.4099	0.0651	1.302	2	0.374196621
	96.5	1.96	0.475				
						X^2 =	7.597833

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 $X^2{}_{table}$ (7.597833< 7.81). So, the distribution list is normal.

2) The Normality Post-Test of the Control Class

<u>Hypothesis:</u> Ho : The distribution list is normal

Ha : The distribution list is not normal

<u>Test of hypothesis:</u>

The formula is used:

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

The computation of normality test:

Max. Score = 84

Min. Score = 63

R = 84- 63 = 21

K = 1+3.3 log 20 = 5.29 or 6

Class length = 21/6 = 3.5 or 4

$\overline{X} = 73.35$

$s^2 = 40.1956$

$s = 6.34$

Table 6

Observation frequency value of post test
Of control class

Class interval	BK	Z_i	$P(Z_i)$	Size classes	Ei	Oi	$\frac{(O_i - E_i)^2}{E_i}$
63 – 66	62.5	-1.78697	0.4633	0.0925	1.85	2	0.012162162
67 – 70	66.5	-1.12818	0.3708	0.1936	3.872	6	1.169520661
71 – 74	70.5	-0.46939	0.1772	0.1018	2.036	3	0.45643222
75 – 78	74.5	0.189403	0.0754	0.2269	4.538	5	0.047034817
79- 82	78.5	0.848195	0.3023	0.1322	2.644	2	0.156859304
83 – 86	82.5	1.506986	0.4345	0.0505	1.01	2	0.97039604
	86.5	2.165778	0.485				
						$X^2 =$	2.812405

With $\alpha = 5\%$ and dk = 6-3 = 3, from the chi-square distribution table, obtained X_{table} = 7.81. Because $X^2{}_{count}$ is lower than $X^2{}_{table}$ (2.812405 < 7.81). So, the distribution list is normal.

3) The Homogeneity Post-Test of the Experimental Class

<u>Hypothesis :</u>

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

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

<u>Test of hypothesis:</u>

The formula is used:

$$F = \frac{Biggest\ variant}{smallest\ variant}$$

The Data of the research:

Variant	Experimental Classes	Control Classes
Total	1614	1467
n	20	20
$\overline{X}$	80.70	73.35
Variant (S^2)	69.2224	40.1956
Standard deviasi (S)	8.32	6.34

Biggest variant (Bv) = 69.2224

Smallest variant (Sv) = 40.1956

$n_1 = 20$

$n_2 = 20$

Based on the formula, it is obtained:

$$F = \frac{69.2224}{40.1956} = 1.7221$$

With α = 5% and dk = (20-1 = 19): (20-1 = 19), obtained F_{table} = 2.15. Because F_{count} is lower than F_{table} (1.7221 < 2.15). 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 concrete nouns test score between students taught using Pictionary and those taught using non Pictionary game.

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

$$t = \frac{\overline{x_1} - \overline{x_2}}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

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

<u>The data of the research</u>:

Variant	Experiment	Control
Total	1613	1467
N	20	20
$\overline{X}$	80.70	73.35
Variant (s^2)	69.2224	40.1956
Standard deviasi (s)	8.32	6.34

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

$$S = \sqrt{\frac{(20 - 1)69.2224 + (20 - 1)40.1956}{20 + 20 - 2}} = 7.3966$$

So, the computation t-test:

$$t = \frac{\overline{x_1} - \overline{x_2}}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = \frac{80.70 - 73.35}{7.3966\sqrt{\frac{1}{20} + \frac{1}{20}}} = 3.142$$

From the computation above, the t-table is 1.68 by 5% alpha level of significance and *dk* = 20 + 20– 2 = 38. T-value was 3.142. So, the t-value was higher than the critical value on the table (3.142 > 1.68).

From the result, it can be concluded that using Pictionary game is more effective than without using Pictionary game in teaching concrete nouns. 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 Pictionary game) has the mean value pre-test was 53.6 and post-test was 80.70. While the control class (the students who are taught without using Pictionary game) has the mean value pre-test was 53.0 and post-test was 73.35.

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 3.142, while the critical value on $t_{s0,05}$ is 1.68. It means that using Pictionary game more effective than without using Pictionary game in teaching concrete nouns.

D. Limitation of the Research

The researcher 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 SDN 01 Donowangun Kab. Pekalongan. 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 Pictionary game using Pictionary game. So that, more optimal of the result will be gained.