CHAPTER IV

RESEARCH FINDINGS AND DISCUSSION

This chapter explains the data got by the researcher in several days and discusses the findings. It is described systematically from the presentation of data, data test scores, and documentation which is continued by explaining the validity and reliability of instruments used in collecting of research findings.

A. Research Finding

Before the researcher answer the research problem, the researcher must present the data have been collected during the research process at the 12th of IPA and IPS majors of MA. Al-Djufri Blumbungan Pamekasan to know the result of this research. The research collects the data on Friday, 7th October 2022. The data related to independent and dependent variable. The presentation of data includes the data presentation of test and documentation.

The presentation of data will be started with data presentation of test because test is as main instrument of this research to measure student vocabulary mastery between IPA and IPS majors. The test is multiple choices test and the data will be analysed by using independent t test formula. Then it will be continued by determining the validity and reliability of test.

1. Data Presentation of Test

In chapter III, the researcher stated that the instrument used is multiple choices test. The test is given to compare the student vocabulary mastery between IPA and IPS majors of 12th grade students. The topic give based on the teacher recommendations.

The researcher asked permission to head master on Friday, 7th October 2022. After that on Tuesday, 11th October 2022, the researcher gave the test for XI IPS class students at 10.00-11.30 AM, and on Saturday, 15th October 2022, the researcher gave the test for XI IPA class students at 08.00-09.30 AM. The test consists of twenty question items. The researcher gave ninety minutes to finish the test for each class. The students were don't allowed to open dictionary and cannot cheat each other because the researcher wanted to know the real ability of them. After the students finished doing the test, they submitted them and the researcher gave score for each students. Where every items has five points for true answer, while for false answer has zero point. So the maximum score is one hundred.

In data presentation of test, the researcher presented and described the student score of XI IPA and XI IPS class as the independent variable. The researcher described the students of XI IPA as group (X) and XI IPS as group (Y). Then the score of both groups (X and Y) is analysed by independent t-test, but the researcher also needed to check the validity and measure the reliability of the test.

a. **Validity of Test**

   Validity test is used to test the extent the accuracy of the tool measures whether or not a questionnaire is valid, for a questionnaire can be said to be valid if a statement or the items on the questionnaire are able to reveal something to be measured to the questionnaire. To check the validity of test, the researcher used content validity. The researcher gave the test that contain all topics of vocabulary have been learned by the students. The purpose of validity is to know the test appropriate or not with the topics of subject. In this research the researcher compared student vocabulary mastery between IPA and IPS majors. Before the test give to the students, the researcher showed the test to Mrs. Siti Ruaida, S.S as the English teacher of MA. Al-Djufri Blumbungan Pamekasan. In worksheets is topic vocabulary that has been taught by him at odd semester. In the validity test is calculated by compare the t value with the t table. If t table > t table with a significance level of 0.05, the indicator of the variable the research can be said to be valid. The following is a table of validity test result by using the SPSS application:

Table 4.1 Instrument Item Variance Score of IPA Major

QUESTION ITEMS	VALIDITY
QUESTION 1	0,402
QUESTION 2	0,472
QUESTION 3	0,170
QUESTION 4	0,513

QUESTION 5	0,164
QUESTION 6	0,200
QUESTION 7	0,285
QUESTION 8	0,418
QUESTION 9	0,038
QUESTION 10	0,431
QUESTION 11	0,799
QUESTION 12	0,462
QUESTION 13	0,460
QUESTION 14	0,587
QUESTION 15	0,308
QUESTION 16	0,305
QUESTION 17	0,284
QUESTION 18	0,460
QUESTION 19	0,570
QUESTION 20	0,308

Table 4.1 Instrument Item Variance Score of IPS Major

QUESTION ITEMS	VALIDITY
QUESTION 1	0,170
QUESTION 2	0,611
QUESTION 3	0,312

QUESTION 4	0,585
QUESTION 5	0,511
QUESTION 6	0,200
QUESTION 7	0,652
QUESTION 8	0,472
QUESTION 9	0,215
QUESTION 10	0,493
QUESTION 11	0,343
QUESTION 12	0,472
QUESTION 13	0,140
QUESTION 14	0,643
QUESTION 15	0,580
QUESTION 16	0,313
QUESTION 17	0,438
QUESTION 18	0,313
QUESTION 19	0,218
QUESTION 20	0,251

Based on the table above showed that all t value for questionnaire question items on the research variable used to produce t value is higher than t table. Its mean that, the test in this research is valid.

b. Reliability of Test

Reliability is also needed in this researcher to measure whether the tests are reliable or not. A good test must be both valid and reliable. So after checking the validity, the researcher should measure the reliability. In this research, the researcher used Kuder-Richardson 21 (K-R 21) formula, because the researcher used multiple choices test that consists of twenty question items. Before accounting the reliability of the test, the researcher made table of scores which is presented in table 4.1 as follows:

Table 4.3 Scores of IPA and IPS Students (X and Y)

NO	X	Y	X^2	Y^2
1	16	8	256	64
2	14	7	196	49
3	6	8	36	36
4	15	17	225	289
5	14	8	196	64
6	6	5	36	25
7	7	13	49	169
8	9	15	81	225
9	9	12	81	144
10	12	5	144	25
11	12	9	144	81
12	13	13	169	169

13	9	6	81	36
14	11	9	121	81
15	6	7	36	49
16	14	8	196	64
17	13	5	169	25
18	9	12	81	144
19	17	7	289	49
20	6	9	36	81
	$\sum X = 218$	$\sum Y = 183$	$\sum X^2 = 2,622$	$\sum Y^2 = 1,897$

Based on the table scores of IPA and IPS students above, the highest score in IPA major is 17, which is obtained by 1 student and the lowest score is 6, which is obtained by 6 students. While for the IPS major, the highest score was 15, which was obtained by 1 student and the lowest score was 5, which was obtained by 3 students.

In applying Kuder Richardson 21 (K-R 21) formula, the researcher should count number of variance and total variance of both groups (X and Y) of the students test then followed by analyzing the reliability of both groups to know whether the test is reliable or not.

Below is a table of instrument item variance scores from variable X (IPA). The researcher gave 20 question items and the score is 5 for each item, where the score of 5 was represented with number 1. By calculating the correct answer times 5 with represented number 1 for each answer.

Table 4.4 Instrument Item Variance Score of IPA Major

X	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	Total	Varians total
1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	0	1	1	1	16	
2	1	1	0	0	1	0	1	1	1	0	1	1	0	1	1	1	1	0	1	1	14	
3	0	0	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	6	
4	0	1	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	1	1	1	15	
5	1	1	1	1	1	0	0	1	1	1	0	1	0	1	1	1	1	0	0	1	14	
6	1	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0	6	
7	0	0	0	0	1	1	0	0	1	0	0	0	0	1	1	0	0	1	1	0	7	
8	1	1	0	0	1	1	0	1	1	0	0	0	0	1	1	1	0	0	0	0	9	
9	0	1	0	0	1	0	1	1	0	1	0	1	0	1	1	0	0	0	1	0	9	
10	0	0	1	0	1	1	0	1	0	1	1	1	1	1	1	0	1	1	0	0	12	12,937
11	1	0	0	0	1	0	0	1	1	1	1	1	1	1	0	1	0	0	0	1	12	
12	1	0	1	1	1	1	0	1	1	0	1	0	0	1	1	0	1	0	1	1	13	
13	0	0	0	0	0	0	0	1	1	0	0	1	1	1	1	1	1	1	0	0	9	
14	0	1	0	0	0	0	0	1	1	1	1	0	1	1	1	0	1	0	1	1	11	
15	0	0	0	0	0	0	1	0	1	0	0	1	0	1	1	0	0	0	0	1	6	
16	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	0	14	
17	0	1	0	0	0	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	13	
18	0	1	0	0	1	1	1	1	1	0	0	0	0	1	1	0	0	0	0	1	9	
19	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	17	
20	0	1	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	6	
VARIANS	0,253	0,253	0,239	0,168	0,168	0,239	0,263	0,095	0,095	0,253	0,263	0,261	0,253	0,134	0,134	0,239	0,261	0,253	0,263	0,239		
jumlah varians	4,326																					
Reliabilitas	0,701																					

a) The Analysis Reliability of IPA Major with Manual

The Computing Number of Variance of Variable X (IPA) Number 1 until number 20

a. Question 1

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)^2}{N}}{N} = \frac{8 - \frac{8^2}{20}}{20} = \frac{8 - 3,2}{20} = \frac{4,8}{20} = 0,24$$

b. Question 2

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{12 - \frac{12}{20}}{20} = \frac{12 - 7,2}{20} = \frac{4,8}{20} = 0,24$$

c. Question 3

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{7 - \frac{7^2}{20}}{20} = \frac{7 - 2,45}{20} = \frac{4,55}{20} = 0,23$$

d. Question 4

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{4 - \frac{4^2}{20}}{20} = \frac{4 - 0,8}{20} = \frac{3,2}{20} = 0,16$$

e. Question 5

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{16 - \frac{16^2}{20}}{20} = \frac{16 - 12,8}{20} = \frac{3,2}{20} = 0,16$$

f. Question 6

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{7 - \frac{7^2}{20}}{20} = \frac{7 - 2,45}{20} = \frac{4,55}{20} = 0,23$$

g. Question 7

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{10 - \frac{10^2}{20}}{20} = \frac{10 - 5}{20} = \frac{5}{20} = 0,25$$

h. Question 8

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{18 - \frac{18^2}{20}}{20} = \frac{18 - 16,2}{20} = \frac{1,8}{20} = 0,09$$

i. Question 9

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)_2}{N}}{N} = \frac{18 - \frac{18^2}{20}}{20} = \frac{18 - 16,2}{20} = \frac{1,8}{20} = 0,09$$

j. Question 10

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)_2}{N}}{N} = \frac{8 - \frac{8^2}{20}}{20} = \frac{8 - 3,2}{20} = \frac{4,8}{20} = 0,24$$

k. Question 11

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)_2}{N}}{N} = \frac{10 - \frac{10^2}{20}}{20} = \frac{10 - 5}{20} = \frac{5}{20} = 0,25$$

l. Question 12

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)_2}{N}}{N} = \frac{11 - \frac{11^2}{20}}{20} = \frac{11 - 6,05}{20} = \frac{4,95}{20} = 0,25$$

m. Question 13

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)_2}{N}}{N} = \frac{8 - \frac{8^2}{20}}{20} = \frac{8 - 3,2}{20} = \frac{4,8}{20} = 0,24$$

n. Question 14

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)_2}{N}}{N} = \frac{17 - \frac{17^2}{20}}{20} = \frac{17 - 14,45}{20} = \frac{2,55}{20} = 0,1$$

o. Question 15

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)_2}{N}}{N} = \frac{17 - \frac{17^2}{20}}{20} = \frac{17 - 14,45}{20} = \frac{2,55}{20} = 0,13$$

p. Question 16

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{7 - \frac{7^2}{20}}{20} = \frac{7 - 2,45}{20} = \frac{4,55}{20} = 0,23$$

q. Question 17

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{9 - \frac{9^2}{20}}{20} = \frac{9 - 4,05}{20} = \frac{4,95}{20} = 0,25$$

r. Question 18

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{8 - \frac{8^2}{20}}{20} = \frac{8 - 3,2}{20} = \frac{4,8}{20} = 0,24$$

s. Question 19

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{10 - \frac{10^2}{20}}{20} = \frac{10 - 5}{20} = \frac{5}{20} = 0,25$$

t. Question 20

$$S_i^2 = \frac{\Sigma X^2_i - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{13 - \frac{13^2}{20}}{20} = \frac{13 - 8,45}{20} = \frac{4,55}{20} = 0,23$$

After all the instrument of variance have been found, the researcher sum, so that the result of the number of variance is 4,11.

(1) The Computing Total Variance of Variable X (IPA)

From table 4.1 above, the computation total variance of variable X (IPA) as follows:

$$S_t^2 = \frac{\sum X_t^2 - \frac{(\sum X_t)^2}{N}}{N} = \frac{13 - \frac{13^2}{20}}{20}$$

$$= \frac{2622 - \frac{218^2}{20}}{20}$$

$$= \frac{2622 - 2,376.2}{20}$$

$$= \frac{245.8}{20} \quad = 12.29$$

(2) The Analysis of Reliability of IPA Major

$$r_{11} = \left(\frac{K}{K-1}\right)\left(1 - \frac{\sum S_i^2}{\sum S_t^2}\right)$$

Notes:

r_{11} : Instrument reliability

k : Number of the item on the test

$\sum S_i^2$: Number of variance of variable

$\sum s_t^2$: Total variance of variable

$$r_{11} = \left(\frac{K}{K-1}\right)\left(1 - \frac{\sum S_i^2}{\sum S_t^2}\right)$$

$$= \left(\frac{20}{20-1}\right)\left(1 - \frac{4,11}{12,29}\right)$$

$$= \frac{20}{19}(1 - 0,334)$$

$$= 1,0526.0,666$$

$$= 0,701$$

b) The Analysis of Reliability of IPA Major with SPS

Table 4.5 Reliability Test of IPA Major

Reliability Statistics	
Cronbach's Alpha	N of Items
,701	20

Table 4.6 Instrument Item Variance Score of IPS Major

Y	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	Total	Varians total
1	1	0	1	0	0	0	0	0	1	1	1	0	0	0	1	1	0	1	0	0	8	
2	0	0	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	1	1	1	7	
3	1	0	1	0	1	0	0	0	1	0	0	1	1	0	1	1	0	0	0	0	8	
4	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	17	
5	1	0	1	0	1	0	0	0	1	0	1	0	0	1	1	1	0	0	0	0	8	
6	1	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	5	
7	0	0	1	1	1	1	0	0	1	1	0	0	0	1	1	1	1	1	1	1	13	
8	1	0	1	0	1	1	1	1	1	0	1	1	1	1	1	0	1	0	1	1	15	
9	1	0	1	0	1	1	0	1	1	0	1	1	1	1	1	0	0	0	0	1	12	
10	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	1	5	11,7132
11	0	0	0	0	1	0	0	1	0	1	1	0	0	1	1	0	0	1	1	1	9	
12	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	0	0	1	1	0	13	
13	0	0	1	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	1	6	
14	0	0	0	0	1	1	1	1	1	0	1	0	0	1	1	0	1	0	0	0	9	
15	0	0	1	0	0	0	0	0	1	0	1	1	1	0	0	0	1	0	1	0	7	
16	1	0	1	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	0	1	8	
17	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	5	
18	1	1	0	0	1	0	0	0	1	0	1	1	1	1	1	1	1	0	0	1	12	
19	0	0	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	1	1	0	7	
20	1	0	1	0	1	0	0	1	1	0	0	0	1	1	1	0	0	0	0	1	9	
VARIANS	0,261	0,134	0,261	0,095	0,197	0,261	0,168	0,261	0,095	0,197	0,253	0,261	0,261	0,261	0,197	0,239	0,239	0,239	0,239	0,253		
jumlah varians	4,371																					
Reliabilitas	0,660																					

c) The Analysis Reliability of IPA Major with Manual

(1) The Computing Number of Variance of Variable X (IPA) Number 1 until number 20.

a. Question 1

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)^2}{N}}{N} = \frac{11 - \frac{11^2}{20}}{20} = \frac{11 - 6,05}{20} = \frac{4,95}{20} = 0,25$$

b. Question 2

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)^2}{N}}{N} = \frac{3 - \frac{3^2}{20}}{20} = \frac{3 - 0,45}{20} = \frac{2,55}{20} = 0,13$$

c. Question 3

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)^2}{N}}{N} = \frac{11 - \frac{11^2}{20}}{20} = \frac{11 - 6,05}{20} = \frac{4,95}{20} = 0,25$$

d. Question 4

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)^2}{N}}{N} = \frac{2 - \frac{2^2}{20}}{20} = \frac{2 - 0,2}{20} = \frac{1,8}{20} = 0,09$$

e. Question 5

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)^2}{N}}{N} = \frac{15 - \frac{15^2}{20}}{20} = \frac{15 - 11,25}{20} = \frac{3,75}{20} = 0,19$$

f. Question 6

$$S_i^2 = \frac{\Sigma X_i^2 - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{9 - \frac{9^2}{20}}{20} = \frac{9 - 4,05}{20} = \frac{4,95}{20} = 0,25$$

g. Question 7

$$S_i^2 = \frac{\Sigma X_i^2 - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{4 - \frac{4^2}{20}}{20} = \frac{4 - 0,8}{20} = \frac{3,2}{20} = 0,16$$

h. Question 8

$$S_i^2 = \frac{\Sigma X_i^2 - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{9 - \frac{9^2}{20}}{20} = \frac{9 - 4,05}{20} = \frac{4,95}{20} = 0,25$$

i. Question 9

$$S_i^2 = \frac{\Sigma X_i^2 - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{18 - \frac{18^2}{20}}{20} = \frac{18 - 16,2}{20} = \frac{1,8}{20} = 0,09$$

j. Question 10

$$S_i^2 = \frac{\Sigma X_i^2 - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{5 - \frac{5^2}{20}}{20} = \frac{5 - 1,25}{20} = \frac{3,75}{20} = 0,19$$

k. Question 11

$$S_i^2 = \frac{\Sigma X_i^2 - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{12 - \frac{12}{20}}{20} = \frac{12 - 7,2}{20} = \frac{4,8}{20} = 0,24$$

l. Question 12

$$S_i^2 = \frac{\Sigma X_i^2 - \frac{(\Sigma X_i)^2}{N}}{N} = \frac{9 - \frac{9^2}{20}}{20} = \frac{9 - 4,05}{20} = \frac{4,95}{20} = 0,25$$

m. Question 13

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)2}{N}}{N} = \frac{9 - \frac{9^2}{20}}{20} = \frac{9 - 4,05}{20} = \frac{4,95}{20} = 0,25$$

n. Question 14

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)2}{N}}{N} = \frac{11 - \frac{11^2}{20}}{20} = \frac{11 - 6,05}{20} = \frac{4,95}{20} = 0,25$$

o. Question 15

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)2}{N}}{N} = \frac{15 - \frac{15^2}{20}}{20} = \frac{15 - 11,25}{20} = \frac{3,75}{20} = 0,19$$

p. Question 16

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)2}{N}}{N} = \frac{7 - \frac{7^2}{20}}{20} = \frac{7 - 2,45}{20} = \frac{4,55}{20} = 0,23$$

q. Question 17

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)2}{N}}{N} = \frac{7 - \frac{7^2}{20}}{20} = \frac{7 - 2,45}{20} = \frac{4,55}{20} = 0,23$$

r. Question 18

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)2}{N}}{N} = \frac{7 - \frac{7^2}{20}}{20} = \frac{7 - 2,45}{20} = \frac{4,55}{20} = 0,23$$

s. Question 19

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)2}{N}}{N} = \frac{7 - \frac{7^2}{20}}{20} = \frac{7 - 2,45}{20} = \frac{4,55}{20} = 0,23$$

t. Question 20

$$S_i^2 = \frac{\sum X_i^2 - \frac{(\sum X_i)2}{N}}{N} = \frac{12 - \frac{12^2}{20}}{20} = \frac{122 - 7,}{20} = \frac{4,8}{20} = 0,24$$

After all the instrument of variance have been found, the researcher sum, so that the result of the number of variance is 4,15.

(2) The Computing Total Variance of Variable Y (IPS)

From table 4.1 above, the computation total variance of variable X (IPA) as follows:

$$S_t^2 = \frac{\sum X_t^2 - \frac{(\sum X_t)^2}{N}}{N} = \frac{1,897 - \frac{183^2}{20}}{20}$$

$$= \frac{1897 - 1,674.45}{20}$$

$$= \frac{222.55}{20} \quad = 11.1275$$

(3) The Analysis Reliability of IPS Major

$$r_{11} = \left(\frac{K}{K-1}\right)\left(1 - \frac{\sum S_i^2}{\sum S_t^2}\right)$$

Notes:

r_{11} : Instrument reliability

k : Number of the item on the test

$\sum S_i^2$: Number of variance of variable

$\sum s_t{}^2$: Total variance of variable

$$r_{11} = \left(\frac{K}{K-1}\right)\left(1 - \frac{\sum S_i^2}{\sum S_t^2}\right)$$

$$= \left(\frac{20}{20-1}\right)\left(1 - \frac{4,15}{11,1275}\right)$$

$$= \frac{20}{19}(1 - 0,3729)$$

$$= 1,0526.0,6271$$

$$= 0,660$$

d) The Analysis of Reliability of IPS Major

Table 4.7 Reliability Test of IPS Major

Reliability Statistics	
Cronbach's Alpha	N of Items
.660	20

From the calculating and SPSS above, the researcher consulted the value of K-R 21 reliability in category of coefficient by Cronbach's Alpha. According Cronbach's Alpha, the basis for making decisions in the reliability test are as follows: first, if Cronbach's Alpha value > 0.60 then the test is declared reliable, and second, if Cronbach's Alpha value < 0.60 then the test is declared unreliable.[1] The result of computing of reliability by manual and SPSS application of IPA and IPS Majors test is higher than the concept of reliability, where the score of IPA major test reliability is 0.701, it means that this test is reliable. While the score of IPS majors test is higher

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[1] Dr. Marjoni Rachman and ahmad Jubaedi, "Analisis Faktor-Faktor Yang Mempengaruhi Kinerja Karyawan," n.d.

than the concept of reliability, where the score of IPS major test reliability is 0.660, it means that this test is reliable.

Table 4.8 Reliability Test of IPA and IPS Majors with SPSS

Major	Cronbach's Alpha	alpha	Description
IPA	,701	0,6	Reliabel
IPS	,660	0,6	Reliabel

c. **Normality of Test**

Normality test is important because to assess the distribution of data in a group of data or variables, whether the distribution of the data is normally distributed or not. There are two types of normality test, first is Kolmogrov, which is for large samples > 50, and second is Shapiro-Wilk, which is for small samples < 50. In normality test for normal decision making, there is a test, if the probably value or significance > 0,05, it means that the data is normally distributed, but if the probably value or significance < 0,05, it means that the data is not normally distributed.[2] Below is a normality test table from the IPA and IPS majors.

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[2] "Memahami Uji Normalitas Dalam Model Regresi," accounting.binus.ac.id, *Https://Accounting.Binus.Ac.Id/2021/08/06/Memahami-Uji-Normalitas-Dalam-Model-Regresi/* (blog), June 8, 2021.

Table 4.9 Test of Normality of IPA and IPS Majors

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
X	,151	20	.200[*]	,924	20	,119
Y	,217	20	,014	,910	20	,063

Major	Sig	Alpha	Description
IPA	0,119	0,05	Normal
IPS	0,063	0,05	Normal

The researcher used the basis for making the decision on the normality test from Shapiro-Wilk because the sample was < 50, and probably value > 0,05. The result of normality test of IPA major is higher than the concept of reliability, where the score of IPA major normality test is 0,119, it means that this test is normal. While the score of IPS major normality test is higher than the concept of reliability is 0,063, it means that the test is normal.

d. Homogeneity of Test

In quantitative research, the homogeneity test is only used in parametric tests that test the differences between the two groups or groups with different subjects or data sources, where the homogeneity test is used to find out whether the variance of several populations is the same or not. In this research, there are two groups, namely the IPA and IPS groups. The basis for making decisions on the homogeneity test are, if the significance value is < 0,05, it is said that the variance of two or more data

population groups is not the same. But, if the significance value is > 0,05, then it is said that the variance of two or more data population groups is the same.

Table 4.10 Test of Homogeneity of Variance

Test of Homogeneity of Variances

SCORE

Levene Statistic	df1	df2	Sig.
.475	1	38	.495

The result of homogeneity test of variances of IPA and IPS major is higher than the concept of homogeneity, where the significance of value is 0.495, it means that the variance of two or more data population groups is the same and homogeneous.

e. Data Analysis

After checking the validity, measuring the reliability, normality and also homogeneity of test, the researcher analyzed the vocabulary mastery using statistical analysis and SPSS version 20 application in the formula dependent t-test to know the comparison of IPA (X) and IPS (Y) majors. Before analyzing the data, the researcher presented the score correct answer of IPA and IPS majors students as follows:

Table of 4.11 Counting IPA and IPS Majors Scores

SKOR					
IPA (X)	IPS (Y)	X	Y	X^2	Y^2
16	8	5,1	-1,15	26,01	1,3225
14	7	3,1	-2,15	4,6225	4,6225
6	8	-4,9	-1,15	24,01	1,3225
15	17	4,1	7,85	16,81	61,6225
14	8	3,1	-1,15	9,61	1,3225
6	5	-4,9	-4,15	24,01	17,2225
7	13	-3,6	3,85	12,96	14,8225
9	15	-1,9	5,85	3,51	34,2225
9	12	-1,9	2,85	3,61	8,1225
12	5	1,4	-4,15	1,96	17,2225
12	9	1,4	-0,15	1,96	0,0225
13	13	2,1	3,85	4,41	14,8225
9	6	-1,9	-3,15	3,61	9,9225
11	9	0,1	-0,15	0,01	0,0225
6	7	-4,9	-2,15	24,01	4,6225
14	8	3,1	-1,15	9,61	1,3225
13	5	2,1	-4,15	4,41	17,2225

9	12	-1,9	2,85	3,61	8,1225
17	7	6,1	-2,15	37,21	4,6225
6	9	-4,9	-0,15	24,01	0,0225
$\sum X= 218$	$\sum Y= 183$	$\sum X= 0,9$	$\sum Y= 0$	$\sum X^2=$ 245,05	$\sum Y^2=$ 222,55

Based on the table scores of IPA and IPS students above, the highest score in IPA major is 17, which is obtained by 1 student and the lowest score is 6, which is obtained by 6 students. While for the IPS major, the highest score was 15, which was obtained by 1 student and the lowest score was 5, which was obtained by 3 students.

a) The Analyze The Data of IPA and IPS Majors by formula independent t-test

    (1) Find out the mean score of IPA majors as group X by using formula,

$$M_x = \frac{\sum X}{N}$$

M_x : Mean score of group X

$\sum X$: The sum scores of group X

N : The number of IPA students (group X)

Based on table 4.2, it can be seen that $\sum X$ is 218 and N is 20. So those can be inserted into following computation:

$$M_x = \frac{\sum X}{N}$$

$$= \frac{218}{20}$$

$$= 10,90$$

So, from the calculating above, the mean score of IPA major as group

X (M_X) is 10,90

(2) Find out the mean of IPS students as group (Y) by using formula,

$M_y = \frac{\sum y}{N}$

M_y : Mean score of group Y

$\sum X$: The sum scores of group Y

N : The number of IPS students (group Y)

Based on table 4.2, it can be seen that $\sum Y$ is 183 and N is 20. So those can

be inserted into following computation:

$M_y = \frac{\sum Y}{N}$

$= \frac{183}{20}$

$= 9,15$

So, from the calculating above, the mean score of IPS major as group

Y (M_y) is 9,15

(3) Find out the standard deviation of IPA majors as group X by using

formula

$SD_x = \sqrt{\frac{\sum X^2}{N}}$

SD_x : Standard deviation of group X

$\sum X^2$: The sum scores squared of group X

N   : The number of the respondent

Based on table 4.9, it can be seen that $\sum X^2$ is 245,05 and N is 20. So those can be inserted into following computation:

$$SD_x = \sqrt{\frac{\sum X^2}{N}}$$

$$= \sqrt{\frac{245,05}{20}}$$

$$= \sqrt{12,260}$$

$$= 3,597$$

So, from the calculating above, the standard deviation of group X (M_x) is 3,597

(4) Find out the standard deviation of IPS majors as group Y by using formula

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

SD_y : Standard deviation of group Y

$\sum Y^2$: The sum scores squared of group Y

N   : The number of the respondent

Based on table 4.2, it can be seen that $\sum Y^2$ is 222,55and N is 20. So those can be inserted into following computation:

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

$$= \sqrt{\frac{222,55}{20}}$$

$$= \sqrt{11,1280}$$

$$= 3,422$$

So, from the calculating above, the standard deviation of group Y (M_y)

is 3,422

(5) Find out the standard error of M_x by using formula

$$SEM_x = \frac{SD_x}{\sqrt{N_{x-1}}}$$

SEM_x : Standard error of mean group X

SD_x : Standard deviation of group X

N_x : The number of IPA students (group X)

$$SEM_x = \frac{SD_x}{\sqrt{N_{x-1}}}$$

$$= \frac{3,480}{\sqrt{20-1}}$$

$$= \frac{3,480}{\sqrt{19}}$$

$$= \frac{3,480}{4,358}$$

$$= 0,804$$

So, from the calculating above, the standard error of M_x is 0,804

(6) Find out the standard error of M_y by using formula

$$SEM_y = \frac{SD_y}{\sqrt{N_{y-1}}}$$

SEM_y : Standard error of mean group Y

SD_y : Standard deviation of group Y

N_y : The number of IPA students (group Y)

$$\text{SEM}_y = \frac{\text{SD}_y}{\sqrt{N_{y-1}}}$$

$$= \frac{3,335}{\sqrt{20-1}}$$

$$= \frac{3,335}{\sqrt{19}}$$

$$= \frac{3,335}{4,358}$$

$$= 0,765$$

So, from the calculating above, the standard error of M_x is 0,765

(7) After obtaining the standard error mean X and standard error Y, the next step is to find the standard error of the difference between mean X and mean Y by using formula

$$\text{SEM}_x\text{-M}_y = \sqrt{\text{SEM}_x^2 + \text{SEM}_y^2}$$

$\text{SEM}_x\text{-M}_y$: Standard error from mean of variable X and variable Y

SEM_x^2 : Standard error of M_x

SEM_y : Standard error of M_y

$$\text{SEM}_x\text{-M}_y = \sqrt{\text{SEM}_x^2 + \text{SEM}_y^2}$$

$$= \sqrt{0,804^2 - 0,765^2}$$

$$= \sqrt{0,646416 + 0,585225}$$

$$= \sqrt{1,231}$$

$$= 1,109$$

So, from the calculating above, the standard error from mean of variable X and variable Y is 1,109

(8) Determining the t value or t_0 by using formula

$$t_0 = \frac{M_X - M_y}{SEM_{X-M_Y}}$$

$$= \frac{10,9 - 9,15}{1,109}$$

$$= \frac{1,75}{1,109}$$

$$= 1,576$$

b) The Analyze The Data of IPA and IPS Majors by formula independent t-test with SPSS application

Table 4.12 The Analyze The Data of IPA and IPS Majors with SPSS

Group Statistics						
Class			N	Mean	Std. Deviation	Std. Error Mean
Vocabulary Mastery	Ipa		20	10,90	3,597	,804
	Ips		20	9,15	3,422	,765

Independent Samples Test										
		Levene's Test for		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Differenc	Std. Error Differenc	95% Confidence	
									Lower	Upper
Hasil penguasa an kosa kata	Equal variances assumed	,475	,495	1,576	38	,123	1,750	1,110	-,497	3,997
	Equal variances not assumed			1,576	37,907	,123	1,750	1,110	-,498	3,998

Item	Sig	alpha	Keterangan
Equal variances assumed	0,495	0,05	there is difference

B. Hypothesis Testing

In quantitative research, hypothesis testing is important to know whether the alternative hypothesis (Ha) or null hypothesis (Ho) is accepted or rejected. To prove it the researcher need to consult the t value to t table. If the t value is same or higher than t table, it means that the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted. While the t value is lower than t table, it means that the null hypothesis (Ho) is accepted and the alternative hypothesis (Ha) is rejected.

The null hypothesis (Ho) of this research states that the students IPA and IPS majors do not have significant difference on the vocabulary mastery the 12th grade students of MA. Al-Djufri Blumbungan Pamekasan, and the alternative hypothesis (Ha) that the students IPA and IPS majors have significant difference on the vocabulary mastery the 12th grade students of MA. Al-Djufri Blumbungan Pamekasan. In this research, the researcher used alternative hypothesis (Ha). The researcher uses formula df $= (N_X+N_Y-2)$ to establish the degree of freedom in consulting the t value with the table. Where, N is as the number of students of group X or Y.

$$df = (N_X + N_Y - 2)$$

$$= (20 + 20 - 2)$$

$$= (40 - 2)$$

$$= 38$$

Table 4.13 The Coefficient Value of "t" Test

Df	5%
38	0,495

The significance level of 5% is 0,495. So that, the t value of t obtained is higher than t table on 5% significance level. It means that the alternative hypothesis (Ha) is accepted. The students IPA and IPS majors have significant difference on the vocabulary mastery the 12th grade students of MA. Al-Djufri Blumbungan Pamekasan with the significance 95%.

C. Discussion

This step presents a discussion of the research problem in the first chapter, the researcher would like to explain the result of the research based on the research finding that has been carried out at MA. Al-Djufri Blumbungan Pamekasan. The result showed show that there is difference between students IPA major and IPS

major in vocabulary mastery. After the researcher calculated and analyzed the data, the researcher gets the results.

According to John, vocabulary is knowledge of knowing the meanings of words and therefore the purpose of a vocabulary test is to find out whether the learners can match each word with a synonym, a dictionary-tape definition, or an equivalent word in their own language. Vocabulary mastery is comprehensive knowledge to recognize, to understand, and to produce the stock of words and their meaning.[3] So, vocabulary mastery is important because it is the main capital in aspects of the English language. Mastering a lot of vocabulary will make it easier for someone to read, write, listen and speak English well. Therefore, the researcher wanted to know the vocabulary mastery between students IPA major and IPS major at 12th grades students of MA.Al-Djufri Blumbungan Pamekasan.

The research results showed that the observation result is 1,576 and t table is 0,495 with a significance level of 5% with degrees of freedom (df) 38. Its mean that showed that t value is higher than t table (1,576< 0,495). Its mean that there is a significant difference between students IPA major and IPS major in vocabulary mastery at the 12th grades of MA.Al-Djufri Blumbungan Pamekasan. The statistical findings seem to be in line with the theory that has been mentioned by Dwi Septiani, there is difference in vocabulary mastery of students IPA major and IPS major. It is

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[3] Nurhidayah, "Students' Vocabulary Mastery in Their Descriptive Text Eleventh Grade Students of SMAN 13 Makassar" (Makassar, Makassar Muhammadiyah University, 2018), 10.

suspected that students IPA major have better vocabulary mastery than IPS Major.[4] Another statements are in line with the theory regarding the difference between IPA and IPS majors, such as research by Fatimatus Zehrah that there is a significant difference between IPA and IPS majors in grammar mastery, where students of IPA major have higher than students IPS major on grammar mastery.[5] Then the research by Isnaria Rizki Hayati that there is significant differences between students IPA major and IPS major in learning skills, where students IPA major have higher learning skills than students IPS major.[6] This statement regarding the differences between IPA major and IPS major is also in line with the form of dichotomy that often occurs in society, namely the perception that IPA major is higher quality than other majors. This perception was confirmed by M. Nu, who had served as Minister of Education, that major discrimination was only created. This statement is reinforced by the assumption that IPA majors are smarter than IPS majors.[7]

Based on data analysis using independent t test formula that the researcher did, the researcher can find out that the students IPA major have better vocabulary mastery than IPS major at the 12th grades students of MA.Al-Djufri Blumbungan Pamekasan. So the alternative hypothesis is accepted, there is a significant difference between students IPA major and IPS major in vocabulary mastery.

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[4] Dwi Septiani, "The Mastery of Students on English Vocabulary between Social Science Class and Natural Sciences Class of Eleventh Graders of SMAN 1 Kapuas Hilir" (IAIN Palangka Raya, 2018), 64.

[5] Fatimatus Zehrah, "The Comparative Study on The StudentsS Grammar Mastery between Natural Sciences Class and Social Sciences Class at The Eleventh Grade of Senior High School 1 Galis Pamekasan" (Pamekasan, STAIN Pamekasan, 2018).

[6] Isnaria Rizki Hayati and Eko Sujadi, "Perbedaan Keterampilan Belajar Antara Siswa IPA Dan IPS," *Jurnal Ilmu Pendidikan* 14 (July 2018).

[7] Mu'awanah and Jacky, "Perang Stigma Antara Siswa IPA/IPS Di MAN Lasem," 3.