CHAPTER III

RESEARCH METHOD

This chapter discusses the method used by the researcher in conducting the research. It consists of research design, variable, population and sample, treatment, instrument of the study, criteria of a good test, data collection method, and data analysis.

A. Research Design

The research design in this study categorized as quasi experimental design which used *two group, pre-test post-test design,* to make sure two groups have equivalent ability before the treatment. The research design in this study will be seen in table 3.1

Table 3.1
Design of the Study

GROUP	PRE-TEST	TREATMENT	POST-TEST
Experimental	✓	Cognitive Linguistics	✓
Control	✓	Rote Strategy	✓

B. Variable of Research

A variable is defined as attribute of a person or of an object which "varies" from person to person or from object to object (Fathor Rasyid, 2015: 45-46). In this research, there are two variables; independent and dependent.

a. Independent variable

The independent variable is the major variable which the researcher hopes to investigate. It is the variable which is selected,

manipulated, and measured by the researcher (Fathor Rasyid, 2015: 46). In this study, independent variable is teaching prepositions strategy. Experimental group was taught by using cognitive linguistics. Meanwhile, control group was taught by using rote learning strategy.

b. Dependent variable

The dependent variable is variable which the researcher observes and measures to determine the effect of the independent variable (Fathor Rasyid, 2015: 46). In this study, dependent variable is student's achievement in using preposition correctly.

C. Population and Sample of the Study

The population of the study was the eleventh grade of MIA students at MAN 4 Kediri, aged 16 to 17, which consist of 4 different classes with total 136 students. Their first language are Javanese. Two groups in the study which were selected by using random sampling, control group and experimental group. The control group, XI MIA 1, consisted of 34 students and experimental group, XI MIA 2, also consisted of 34 students.

D. Instrument of the Study

In this study, the researcher used only the test. According to Hung (2018), test is a set of tool, procedure or an activity presented to an individual in order to elicit attitude that give information about the basic of individual knowledge in certain subject. The type of the tests was a paper-and-pencil-test, which was printed on A4 paper.

The test is given in the form fill in the blank with three options (*in/on/at*). This type is chosen because it is economical in term of the number of items that can be answered in a short period of testing time; students' test papers also can be easily and quickly scored. Thus, the students do not confuse in answering the question presented.

The tests are pre-test and post-test. Before the pre-test is given, the researcher conducted the try out first.

a. Pre-test

This test is used to know the students' ability in some question before the researcher gives some treatments. The test is given to both of groups, experimental and control group. In a pre-test, the students is given 45 minutes to answer 27 fill in the blank questions that consist of three domains; spatial, temporal, and abstract. After the treatments in each group, the post-test is conducted.

b. Post-test

The post-test is given to all of sample after both the experimental and control group get the treatments, which is cognitive linguistics strategy for experimental group and rote learning strategy for control group. The post-test also consists of 27 questions in the form of fill in the blank that consist of three domains; spatial, temporal, and abstract, the students given 45 minutes to answer.

E. Criteria of a Good Test

Try out was conducted to make sure the quality of the test is good before it is used into pre-test and post-test. This phase aims to arrange the good items test. Try out was conducted to another class except experimental and control group which has the similar characteristics with both group; experimental and control, that was the students of XI-MIA 3. The subjects of the try out consist of 34 students. There are 50 items fill in the blank with three options (*in,on,at*). The students have 60 minutes to do it. The complete try out can be seen in Appendix 2.

Table 3.2
Items of Questions

No.	Object	Item Number
1.	Spatial preposition domain	3, 4, 5, 6, 16, 17, 21, 22, 23, 28, 31, 39, 40, 41, 48, 49
2.	Temporal preposition domain	7, 8, 9, 10, 11, 18, 19, 20, 24, 29, 32, 34, 35, 36, 44
3.	Abstract preposition domain	1, 2, 12, 13, 14, 25, 26, 27, 30, 33, 37, 38, 45, 46, 47, 50

To know whether the test is good or not, the researcher confirmed it through validity, reliability, level of difficulty, and discrimantion power. The following are the explanation of validity, reliability, level of difficulty, and discrimantion power.

a. Validity of Instrument

Validity is a measurement which shows the grades of number of instrument. The contents of the test items are valid if they are based on the degree to which the test actually measured and simply related to what they are actually designed and planned. Construct validity is used with correlation

between item score and total score. It is computed using *Pearson Product Moment in* SPSS.

The test items were said to be valid if the value of the correlation was greater than the r value of the table, or, in the significance level of 5% or 0.05 (Hatch and Farhady. 1982: 199). R_{table} for N 34 (df-2= 32) is 0.349. The valid items number 3, 6, 7, 9, 10, 14, 15, 18, 21, 25, 27, 28, 32, 33, 34, 35, 36, 37, 38, 39, 41, 43, 45, 46, 47, 49, and 50. For the complete validity output can be seen in Appendix 3.

b. Reliability of Instruments

Reliability can be defined as the extent to which a test produces consistent result when administrated under similiar condition (Fathor Rasyid: 2015). It means the stability of the test scores on repeated trials. The test is reliable if it provides stable and consistent indication of the characteristics being investigated. The standard of reliability coefficient can be seen in table 3.3.

Table 3.3
Table of Reliability Coefficient

Reliability Coefficient	Category
0.800 – 1.000	Very High
0.600 – 0.790	High
0.400 – 0.599	Sufficient
0.200 – 0.399	Low
0.000 – 0.199	Very Low

Table 3.4
Reliability Statistics

Cronbach's Alpha	N of Items
,772	50

Based on Cronbach's Alpha in the reliability statistics table, it can be concluded that the test is high reliability category with result 0.772.

c. The level of difficulty

Level of difficulty is considered to be one of the most important characteristics of test items. Considering the level of difficulty of items is important as it determines the result of tests. An item is considered had a good difficulty level if it is not too easy or too difficult for students. Every item should be analyzed first before it is used in a test. The value of the level of difficulty is computed by using formula:

$$P = \frac{n}{N}$$

P= index of difficulty

n= the number of correct number

N= the number of students' taking the test

Table 3.5
The Standard Level of Difficulty

Interval	Criteria
0.00- 0.30	Difficult
0.31- 0.70	Fair
0.71- 1.00	Easy

From the calculation, the items that belong to fair criteria are 3, 15, 33, 43, 47, 49. Next, the items that belong to easy criteria are 6, 7, 9, 10, 14, 18,

21, 25, 27, 28, 32, 34, 35, 36, 37, 38, 39, 41, 43, 45, 46, 47, 49. Then, the items that belong to difficult criteria is 50.

d. Discrimination Power

The discrimination power of an item indicates the extent to which the item discriminated between the test. The index of discriminating shows whether those students who performed well overall tests tended to do well or badly on each item in test. The formula used to know the discrimination power is:

$$DP = \frac{U - L}{n}$$

DP= index of discrimination power

U= the number of correct answer for upper group

L= the number of correct answer for lower group

n= the number of the upper and lower group

Table 3.6
Index of Discrimination Power

Interval	Criteria
0.00<D≤ 0.20	Poor
0.21<D≤ 0.40	Satisfactory
0.41<D≤ 0.70	Good
0.71<D≤ 1.00	Excellent

From the calculation, the items that belong to excellent criteria are 3, 6, 7, 9, 10, 14, 15, 18, 21, 25, 27, 28, 32, 33, 34, 35, 36, 37, 38, 39, 41, 43, 45, 46, 47, 49. And the items that belong to satisfactory criteria is 50. For the details, see the table below:

Table 3.7
The Result of Index of Difficulty and Index of Discrimination

NO	Item	N	N	Index of Difficulty	Criteria	Discrimination Power	Criteria	Note
1	3	23	34	0.68	Fair	1	Excellent	Used
2	6	29	34	0.85	Easy	1	Excellent	Used
3	7	25	34	0.74	Easy	1	Excellent	Used
4	9	28	34	0.82	Easy	1	Excellent	Used
5	10	32	34	0.94	Easy	1	Excellent	Used
6	14	29	34	0.85	Easy	1	Excellent	Used
7	15	23	34	0.68	Fair	1	Excellent	Used
8	18	30	34	0.88	Easy	1	Excellent	Used
9	21	28	34	0.82	Easy	1	Excellent	Used
10	26	30	34	0.88	Easy	1	Excellent	Used
11	27	31	34	0.91	Easy	1	Excellent	Used
12	28	29	34	0.85	Easy	1	Excellent	Used
13	32	31	34	0.91	Easy	1	Excellent	Used
14	33	20	34	0.59	Fair	1	Excellent	Used
15	34	30	34	0.88	Easy	1	Excellent	Used
16	35	20	34	0.59	Fair	1	Excellent	Used
17	36	25	34	0.74	Easy	1	Excellent	Used
18	37	27	34	0.79	Easy	1	Excellent	Used
19	38	31	34	0.91	Easy	1	Excellent	Used
20	39	29	34	0.85	Easy	1	Excellent	Used
21	41	32	34	0.94	Easy	1	Excellent	Used
22	43	23	34	0.68	Fair	1	Excellent	Used
23	45	27	34	0.79	Easy	1	Excellent	Used
24	46	31	34	0.91	Easy	1	Excellent	Used
25	47	16	34	0.47	Fair	1	Excellent	Used
26	49	15	34	0.44	Fair	1	Excellent	Used
27	50	12	34	0.29	Difficult	0.46	Satisfactory	Used

F. Treatment

In dealing with threats of validity, the researcher proposed some ways in conducting the study. First, the researcher had the role as researcher-teacher in which the researcher also gave the treatment and taught both to the experimental group and control group during the study. Second, the researcher gave similar

teaching materials of prepositions, pre-test, and post-test questions to both experimental and control groups. The researcher gave different strategy in teaching prepositions; cognitive linguistics strategy for experimental group and rote learning strategy for control group. Third, the researcher told the students do not share the test questions to other students from different classes. It used to prevent the experimental group and control group to interact each other.

The difference of activities during treatment can be seen in the table below:

Table 3.8
The Activities During Treatment

TREATMENT	Procedure based on CL strategy	EXPERIMENTAL GROUP	CONTROL GROUP
TREATMENT I (Teaching Spatial Domain)	Selecting information	- The teacher shows sentences complete with picture and the images schemas based on the theory of images schemas in cognitive linguistics strategy	- The teacher asks the students to read the definitions and examples of each preposition in spatial usages
	Organizing the information	- The teacher relates the spatial usages on the sentences by using image schemas	- The teacher tells the students how to distinguish these prepositions: *in*, *on* and *at* in spatial usages
	Activating related prior knowledge	- The teacher explains and gives examples how to analyse the sentences with theory of images schemas in cognitive linguistics strategy	- The teacher asks the students to match every picture with the definitions of prepositions
	Constructing coherence information	- Let the students to analyse the other sentences with the same steps as the teacher explain before	- The teacher asks the volunteer to share their answer
			- The teacher provides some phrases and asks the students to make the sentence based on the phrases provided
			- The students and the teacher discuss together
TREATMENT II (Teaching Temporal Domain)	Activating related prior knowledge	- Elaborates the previous prepositions on spatial usages with new prepositions on temporal usages	- Elaborates the previous prepositions on spatial usages with new prepositions on temporal usages
	Selecting information	- The teacher shows sentences complete with picture and the images schemas based on the theory of images schemas in cognitive linguistics strategy	- The teacher asks the students to read the definitions and examples of each preposition in temporal usages
	Organizing the	- The teacher relates the	- The teacher tells the students

	information	temporal usages on the sentences by using image schemas	how to distinguish these prepositions: *in*, *on* and *at* in temporal usages
	Activating related prior knowledge	- The teacher explains and gives examples how to analyse the sentences with theory of images schemas in cognitive linguistics strategy	- The teacher asks the students to match every picture with the definitions of prepositions
	Constructing coherence information	- Let the students to analyse the other sentences with the same steps as the teacher explain before	- The teacher asks the volunteer to share their answer
			- The teacher provides some phrases and asks the students to make the sentence based on the phrases provided
			- The students and the teacher discuss together
TREATMENT III (Teaching Abstract Domain)	Activating related prior knowledge	- Elaborates the previous prepositions on temporal usages with new prepositions on abstract usages	- Elaborates the previous prepositions on temporal usages with new prepositions on abstract usages
	Selecting information	- The teacher shows sentences complete with picture and the images schemas based on the theory of images schemas in cognitive linguistics strategy	- The teacher asks the students to read the definitions and examples of each preposition in abstract usages
	Organizing the information	- The teacher relates the abstract usages on the sentences by using image schemas	- The teacher tells the students how to distinguish these prepositions: *in*, *on* and *at* in abstract usages
	Activating related prior knowledge	- The teacher explains and gives examples how to analyse the sentences with theory of images schemas in cognitive linguistics strategy	- The teacher asks the students to match every picture with the definitions of prepositions
	Constructing coherence information	- Let the students to analyse the other sentences with the same steps as the teacher explain before	- The teacher asks the volunteer to share their answer
			- The teacher provides some phrases and asks the students to make the sentence based on the phrases provided
			- The students and the teacher discuss together

The research began on March 6th, 2019 and ended on April 10th, 2019.

The researcher conducted 5 meetings. Each meeting was 2x45 minutes.

Table 3.9
The Schedule of the Research

Meeting	Stages	Topic	Experimental	Control
1	Pre-test	Prepositions	March 6th, 2019	March 6th, 2019
2	Treatment 1		March 13rd, 2019	March 14th, 2019
3	Treatment 2		March 20th, 2019	March 21st, 2019
4	Treatment 3		March 27th, 2019	March 28th, 2019
5	Post-test		April 10th, 2019	April 10th, 2019

G. Data Collection Method

This study used the quasi-experimental design. The procedure of data collection method are pre-test, treatment, and post-test. In a pre-test, the students given 45 minutes to answer 27 fill in the blank questions that consist of three domains; spatial, temporal, and abstract. For each correct answer could be scored one points. The researcher supervised the students during the pre-test to make sure it runned well.

After the treatments in each group, the post-test is conducted. The post-test consists of 27 questions, in the form of fill in the blank that consist of three domains; spatial, temporal, and abstract. The researcher also supervised the students during the post-test to ensure the students answer by themselves to get the valid data.

H. Data Analysis

The collected data are input into SPSS 21 for computation. The data analyzes using *ANCOVA* (Analysis of Covariate). The researcher wants to know the effectiveness of cognitive linguistics strategy in teaching prepositions. The researcher did some tests before the hypothesis test such as test of normality, test of homogeneity, test of homogeneity regression, and test of linear relationship. The hypothesis was accepted if *p value* was lower than 0.05.