CHAPTER III
RESEARCH METHODOLOGY

III.1 Research Design

This research was a quasi-experimental design which focused on quantitative research. According to Creswell, J. W (2008:160), quasi-experimental design with nonequivalent pre-test and post-test control-group design is the most frequent used by researchers. It involves selecting two or more groups without random assingment. The groups take a pre-test and a post-test. Only the experimental groups receive the treatment.

In this research, three groups of participants were selected. They referred to an experimental group 1, an experimental group 2, and a control group. A Control group was used because this research compared two strategies that were applied in the experimental classes. To determine whether the strategies applied in the experimental classes were more effective than the conventional way, a control group was required. The function of the control group was to control the strategies applied in the experimental classes and as the comparative group that would compare the effect of the strategies applied. The groups may differ in a number of ways. One group might possess a characteristic that the other might not, one group may possess more characteristic than the other, or the two groups may have had different kind of experiences. This research had 3 variables; Concept Map Strategy (X1) and Anticipation Guide Strategy (X2) were independent variables, while the students' reading comprehension was dependent variable which can be seen in the following table:

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Table III.1 Research Design

EG 1	O 1	X1	O 2
EG 2	O 1	X2	O 2
Control Group	O 1		O 2

Figure (Gay, 2000: 353)

EG 1   : Experimental Group 1

EG 2   : Experimental Group 2

O 1   : Pre-test

O 2   : Post-test

X1   : Independent variable 1 (Concept Map Strategy)

X2   : Independent variable 2 (Anticipation Guide Strategy)

Gay (2000:354) states that definition and selection of comparison group are very important parts of the quasi experimental design procedure. The independent variable which differentiates the groups must be clearly and operationally defined since each group represents a different population. The way in which the group is defined will affect the generalizee ability of the results.

III.2 The Location and the Time of the Research

This research was conducted at SMAN 1 Siak Hulu which is located at No. 10 Depnaker Street in Pangkalan Baru Village, Siak Hulu Sub-district, District of Kampar. The research was conducted for two months from February 2017 through March 2017.

III.3 The Population and Sample of the Research

III.3.1 Population

Population is all members of the research subject or all individuals from whom the data are collected. The population of this research was the eleventh grade students of SMA Negeri 1 Siak Hulu in the academic year 2016/2017 which consisted of five classes with 32 students in each class. The total of the population was 160 students. Three of five classes were chosen as the sample of the research by using cluster sampling technique. Cluster sampling technique was used because the samples were chosen based on the groups, not individual. The groups had the same characteristics and were homogenous. The description of the population is presented in the following tables:

Table III.2. The Population of the Eleventh Grade Students of SMAN 1 Siak Hulu

Class	Total of Students
XI/a	32
XI/b	32
XI/c	32
XI/d	32
XI/e	32
Total Population	**160**

III.3.2 Sample

Best (1981:130) asserts that a sample is a small proportional of population selected for the observation and the analysis. Additionally, Kerlinger (1965:118) states that the sample is a part of population, which is supposed to represent the characteristics of the population. The technique used to select the sample of this study was cluster sampling technique because the sample was select based on group, not individual. Gay (2000:12) states cluster sampling randomly selects groups, not individual. All the members of selected groups have similar characteristics. In this research, of the five classes in the eleventh grade, three classes were taken as the sample of this research (XI/a, XI/b, and XI/c). XI/a participated as an experimental group 1, XI/b participated as an experimental group 2, and XI/c participated as a control group. The sample was selected based on the teacher's information about the students' abilities in English and the results of the pre-test which were tested to the participants to determine whether they were homogenous or not. The sample of the research can be figured out in the following table:

Table III.3 Sample of the research

No	Sample	Male	Female	Total
1	XI/a	12	20	32
2	XI/b	11	21	32
3	XI/c	10	22	32
	Total	**33**	**63**	**96**

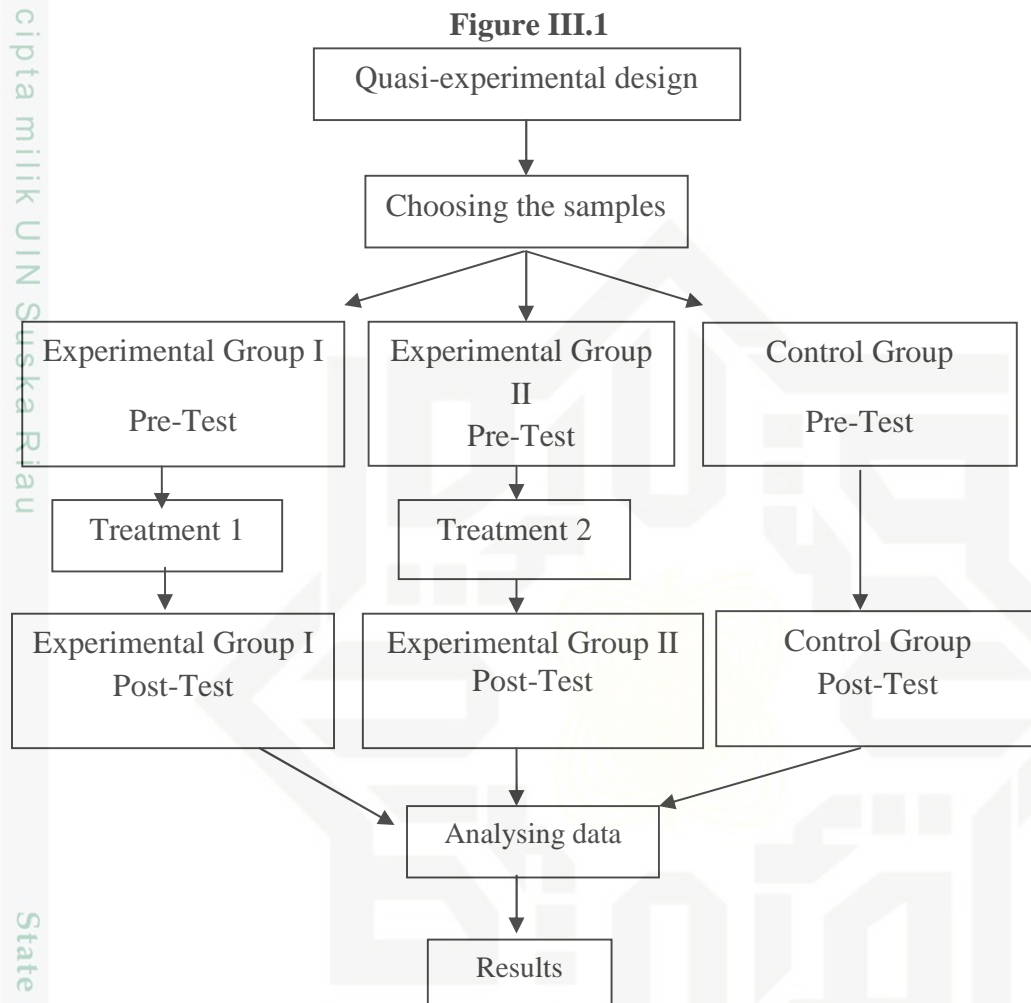## III.4 Research Procedure

Figure III.1

Figure III.1 indicates that some steps were passed through in this research. First of all, a pre-test was administered to both the experimental classes and the control class. It was conducted to see whether or not all groups were homogenous. Afterward, the experimental class 1 was taught by using Concept Maps Strategy and the experimental class 2 was taught by using Anticipation Guide Strategy. Each of the class was taught for four meetings or eight-hours class, while the control class was taught by using non-Concept Maps Strategy and non-Anticipation Guide Strategy. After the treatments were completed, a post-test was

conducted to see the improvement of students' reading comprehension. Finally, the entire data of both pre-test and post-test scores of all classes were analysed by using SPSS 20 Program to answer the research questions mentioned in chapter II.

III.5 Research Instruments

A reading test was administered as the instrument of this study. The pre-test and the post-test were administered to three classes (XI/a, XI/b and XI/c). The pre-test was administered before the treatment to know the students' ability before giving the treatments and to determine whether the students were homogenous or not and the post-test aimed at finding out the students' reading comprehension after the treatment. The treatments were given by teaching the experimental classes using Concept Maps Strategy and Anticipation Guide Strategy. These activities were also intended to find out whether the students could retain their skill after doing the treatment.

III.5.1 Pilot Study

A pilot study is a standard scientific tool for the scientific research that allows the researcher to conduct a preliminary analysis before omitting to a full-blown of study or experiment. It is a small scale preliminary study conducted in order to evaluate feasibility, time, cost, adverse events, and effect size (statistical variability) in an attempt to predict an appropriate sample size and improve upon the study design prior to performance of a full-scale research project (Stephen B, 2007: 168-169).

1. **The Preparations of the Study**

In order to find out an optimal and an accountable results of this research, some preparations were made as illustrated below:

a. **Making Instruments**

Instrument plays an important role in a research in order to collect data required in the experiment. A reading comprehension test was administered in this research. The test was limited to hortatory exposition where 30 items of multiple choice test were tested to the students. The test was classified into six indicators: five items to measure the students' ability in finding the topic of the text, five items to measure students' ability in finding the main ideas of the paragraphs, five items to measure students' ability in finding the detailed information of the text, five items to measure students' ability in determining the references of the words, five items to measure students' ability in determining the antonym/synonym of the words, and five items to measure students' ability in determining the inferences presented in Table III.4:

Table III.4

The Blueprint of Reading Comprehension of Hortatory Exposition Text

No	Reading Comprehension	Items	Total of
1.	The topic of the text	1, 7, 13, 19, 25	5
2.	The main idea of paragraph	2, 8, 14, 20, 26	5
3.	The detailed information of the text	3, 9, 15, 21, 27	5
4.	Synonym/Antonym	5, 11, 17, 22, 29	5
5.	References	4, 10, 16, 23, 28	5
6.	Inferences	6, 12, 18, 24, 30	5
	TOTAL		30

In addition, the students' scores were classified into some levels. They are tabulated in the following table:

Table III.5

The Classification of Students' Reading Comprehension Score

Score	Category
81 – 100	Excellent
61 – 80	Good
41 – 60	Mediocre
21 – 40	Poor
0 – 20	Very poor

b. **Teacher Training**

It was important to train the teacher in order to make the processes of implementing of the treatments run appropriately. The English teacher of class XI/a was trained how to implement Concept Maps Strategy in class, whereas, the English teacher of class XI/b was trained how to implement Anticipation Guide Strategy.

c. **Conducting Try Out**

A try out was administered in order to get realible and valid items which were eligable to use in this research. It was tested to the students who did not participate in this research.

d. Analyzing the Realibility and Validity of the Instrument

The realibility and validity of each item was analysed through SPSS 20 program after conducting the try out. Finally, the realible and valid items were used as the instrument both pre-test and the post-test.

III.6 Data Collection Technique

III.6.1 Observation

Observation lists were used to observe directly how Concept Maps Strategy in the experimental group 1 and Anticipation Guide Strategy in the experimental group 2 were apllied. Further, it was done to see how far or whether or not the indicators of both Concept Maps Strategy and Anticipation Guide Strategy were met the requirements .

Table III.6

Observation List of Concept Maps Strategy

NO	ITEMS OBSERVED	Yes	No
1	The teacher introduced a concept to the students.		
2	The teacher asked the students to read the text for about 10 minutes.		
3	The teacher asked the students to write some other concepts associated with the main concept in group of 2.		
4	The teacher asked the students to rank the concepts from most general to least general.		
5	The teacher asked the students to write the most general concept on the top of the paper.		
6	The teacher asked the students to connect the concepts with directional links.		
7	The teacher gave the students the time to make the concept map.		
8	The eacher checked the students' work.		
9	The teacher asked the students to show their concept maps to their friends.		
10	The teacher collected and reviewed the students' concept maps.		
11	The teacher returned the students' concept maps and asked them to rethink their ideas.		
	TOTAL		
	PERCENTAGE (%)		

Table III.7

Observation List of Anticipation Guide Strategy

NO	ITEMS OBSERVED	Yes	No
1	The teacher chose a topic of a reading text.		
2	The teacher read the major concepts or ideas to which the students would react.		
3	The teacher included 5 to 10 accurate and inaccurate statements related to the content.		
4	The teacher asked the students to react to a series of statements designed by the teacher.		
5	The teacher asked the students to share with their peers about their opinions.		
6	The teacher served as facilitator, giving no hints regarding the correct or incorrect responses.		
7	The teacher asked the students to go back to their initial reactions.		
8	The teacher asked the students to read the selected text to find supporting or contradictory evidence for their responses.		
9	The teacher asked the students to choose to maintain or change their original thoughts by using information from the text to support their position.		
	TOTAL		
	PERCENTAGE (%)		

III.6.2 Test

A reading comprehension test was administered in two stages: a pre-test and post-test to the experimental class 1, the experimental class 2 and the control class. The test consisted of 30 items of multiple choices. It was assumed that each item could be answered for two minutes. A pre-test was administered before the students obtained the treatments. It was done to measure the students' reading comprehension's ability before they were given the treatments. The experimental class 1 was taught by using Concept Maps Strategy and the experimental class 2 was taught by using Anticipation Guide strategy, while the control class was

taught by using non concept maps strategy and non anticipation guide strategy. Afterward, a post-test was given. It was intended to see the students' improvement after getting the treatments. Finally, the results were analyzed to answer the research questions.

III.7 Reliability and Validity Test

III.7.1 Reliability of the Test

Reliability refers to whether the test is consistent in its score and gives us an indication of how the test score is accurate (Shohamy, 1985:70). It is defined as the extent to which a test produces consistent results when it is administered under similar condition (Hatch and Farhady, 1982:243). In addition, Brown (2003) suggests reliability has to do with accuracy of measurement. That is why reliability is important to be measured. The following table is the level of internal consistency of Cronbach Alpha.

Table III.8

The level of internal consistency of Cronbach' Alpha

Cronbach' Alpha	Internal Consistency
.9	Excellent
.9 > .8	Good
.8 > .7	Acceptable
.7 > .6	Questionable
.6 > .5	Poor
.5 >	Unacceptable

To obtain the reliability of the test given, SPSS 20 program was used to find out whether or not the test was reliable.

III.7.2 Validity of the Test

Creswell suggests that validity is the individual's scores from an instrument make sense, meaningful, enable you, as the researcher, to draw good conclusions from the sample you are studying to the population (Creswell 2008:169). It means that validity is the extent to which inferences made from assessment results are appropriate, meaningful, and useful in terms of the purpose of the assessment. To analyse the validity of data, inter item validity was analysed using SPSS 20 program. The following table is the criteria of items validity.

Table III.9

The criteria of items validity

r	Interpretation
$0,80 < r \leq 1,00$	Very High
$0,60 < r \leq 0,79$	High
$0,40 < r \leq 0,59$	Average
$0,20 < r \leq 0,39$	Low
$0,00 < r \leq 0,19$	Very Low

III.8 The Results of Reability and Validity of the Try Out

Try out has been conducted to the students who did not participate in the research to find out the reability and the validity of the test. Try out has been conducted on February 8th, 2017. 26 students were involved in this try out. They were adopted from the second year students of SMAN 1 Siak Hulu. Try out items consisted of 30 items of multiple choices. There were six indicators tested in the try out: (1) Identifying the topic, (2) identifying the main idea, (3) finding the detailed information, (4) determining synonym/antonym, (5) determining

reference, and (6) inference. The results of the try out was shown in the following tables:

Table III.10

Reliability Statistics

Cronbach's Alpha	N of Items
,786	30

Table III.10 indicates that the value of cronbach's alpha is 0.786. It means that the items are reliable, in which the value of internal consistency is .8 > .786 .7. So, it indicites the reliability of test is **Acceptable**.

Table III.11

Validity of Indicator 1 (Identifying the Topic)

Item	r	Interpretation of Validity	Status
1	0.466	Average	Valid
7	0.788	High	Valid
13	0.788	High	Valid
19	0.782	High	Valid
25	0.782	High	Valid

The correlation test shows that item 1 (r=0.466), item 7 (r=0.788), item 13 (r=0.788), item 19 (r=0.782), and item 25 (r=0.782) are valid. It means item 1, item 7, item 13, item 19, and item 25 are able to measure the students' reading comprehension in term of identifying the topic.

Table III.12

Validity of Indicator 2 (Identifying the Main Idea)

Item	r	Interpretation of Validity	Status
2	1.000	Very High	Valid
8	1.000	Very High	Valid
14	1.000	Very High	Valid
20	1.000	Very High	Valid
26	1.000	Very High	Valid

The correlation test determines that item 2 (r=1.000), item 8 (r=1.000), item 14 (r=1.000), item 20 (r=1.000), and item 26 (r=1.000) are valid. It means item 2, item 8, item 14, item 20, and item 26, can be used to measure the students' reading comprehension in terms of identifying the main idea.

Table III.13

Validity of Indicator 3 (finding the Detailed Information)

Item	r	Interpretation of Validity	Status
3	0.834	Very High	Valid
9	0.834	Very High	Valid
15	0.489	Avarage	Valid
21	0.672	High	Valid
27	0.672	High	Valid

The correlation test indicates that item 3 (r=0.834), item 9 (r=0.834), item 15 (r=0.489), item 21 (r=0.672), and item 27 (r=0.672) are valid. Thus, item 3, item 9, item 15, item 21, and item 27 can be used to measure the students' reading comprehension in terms of finding the detailed information.

Table III.14

Validity of Indicator 4 (Determining Synonym/Antonym of the Word)

Item	r	Interpretation of Validity	Status
5	0.786	High	Valid
11	0.577	Average	Valid
17	0.786	High	Valid
22	0.786	High	Valid
29	0.497	Average	Valid

The correlation test shows that item 5 (r=0.786), item 11 (r=0.577), item 17 (r=0.786), item 22 (r=0.786), and item 29 (r=0.497) are valid. Thus, item 5, item 11, item 17, item 22, and item 29 can be used to measure the students' reading comprehension in terms of determining synonym/antonym of words.

Table III.15

Validity of Indicator 5 (Determining Reference)

Item	r	Interpretation of Validity	Status
4	0.681	High	Valid
10	0.864	Very High	Valid
16	0.697	High	Valid
23	0.445	Average	Valid
28	0.864	Very High	Valid

The correlation test indicates that item 4 (r=0.681), item 10 (r=0.864), item 16 (r=0.697), item 23 (r=0.445), and item 28 (r=0.864) are valid. Thus, item 4, item 10, item 16, item 23, and item 28 can be used to measure the students' reading comprehension in terms of determining reference.

Table III.16

Validity of Indicator 6 (Determining Inference)

Item	r	Interpretation of Validity	Status
6	1.000	Very High	Valid
12	1.000	Very High	Valid
18	1.000	Avarage	Valid
24	1.000	High	Valid
30	1.000	High	Valid

The correlation test determines that item 6 (r=1.000), item 12 (r=1.000), item 15 (r=1.000), item 24 (r=1.000), and item 30 (r=1.000) are valid. Thus, item 6, item 12, item 18, item 24, and item 30 can be used to measure the students' reading comprehension in terms of determining inference.

III.9 Data Analysis Technique

A scoring guide was used as the criteria of scoring representing the basic aspects of reading. The reading results were analyzed by considering six aspects and each aspect had a score or a level. The specifications of the aspects were the topic, the main idea, detailed information, synonym/antonym, reference and inference.

In analysing the data, the researcher used the scores of the pre-test and the post-test of the experimental and the control groups. These scores were analyzed statistically for both descriptive and inferential statistics. In this research, the independent sample t-test and paired sample t-test were analyzed by using SPSS 20 version (Statistics package for the Social Sciences).

1. **Independent sample t-test**

Independent Sample t_{test} was used to find out whether there was or there was no significant difference between two or more variables. Gay reveals that the t-test for independent sample is used to determine whether there is probably a significant difference between the mean score of two independent samples.

The t-table had the function to see if there was a significant difference among the mean score of the experimental group 1, the experimental group 2, and the control group. The t-obtained value was consulted with the value of t-table at the degree of freedom (df) = (N1+N2)-2 which was hypothesized

Ha: to > t-table

Ho: to < t-table

Ha was accepted if to > t-table or there was effect after giving the treatment using Concept Maps Strategy and Anticipation Guide Strategy on students' reading comprehension.

Ho was accepted if to< t-table or there was no effect after giving the treatment using Concept Maps Strategy and Anticipation Guide Strategy on reading comprehension.

2. **Paired Sample t-Test**

Paired Sample t-Test is known also as Non-independent sample t-test. Gay (2000: 488) states that t-test for non independent samples is used to compare groups that are formed by some type of matching or to compare a single group's performance on a pre- and post-test or on two different treatments. At this time, paired sample T-test was used to find out whether there was a significant

difference before and after using Concept Maps Strategy and Anticipation Guide Strategy on students' reading comprehension by using the pre-test and post scores of the experimental group 1, the experimental group 2, and the control group

The t-table had the function to see if there was a significant difference among the mean score of both pre-test and post-test. The t-obtained value was consulted with the value of t-table at the degree of freedom (df) N-1 which was statistically hypotheses:

H_o: to < t-table

H_a: to > t-table

H_o was accepted if to< t-table or there was no significant effect after using Concept Map Strategy and Anticipation Guide Strategy on students' reading comprehension.

H_a was accepted if to > t-table or there was a significant effect after using Concept Map Strategy and Anticipation Guide Strategy on the students' reading comprehension.

Afterward, it was better to find the effect size of T-test by following formula[1]:

$$\tilde{\eta}^2 = \frac{t^2}{t^2+n-1}$$

eta squared = $\tilde{\eta}^2$ x 100%

Where:

eta squared   :   Coefficient effect

$\tilde{\eta}^2$:   Coefficient