

## CHAPTER III

### METHODOLOGY

This chapter presents the methodology of the current research. Further explanation regarding the research design, research participants and the site will be provided, along with elaboration on how data for the research will be collected and analyzed.

#### 3.1 Research Design

The objective of this study is to measure how the Directed Reading Thinking Activity (DRTA) as a strategy used inside the classroom might help EFL learners with their reading comprehension. In order to meet the result, this present study would employ a quantitative method with a quasi-experimental design to collect quantitative data. Experimental research assesses a particular variable's impact and tests the hypothesis of a cause-and-effect relationship (Fraenkel et al., H. H, 2012). Quasi-experimental is a research design used to determine the effect of specific treatments on experimental and control groups. Quasi-experimental research designs are frequently employed within the realm of educational research when the execution of authentic randomized controlled trials (RCTs) becomes unviable or ethically challenging due to pragmatic limitations. These limitations often manifest as the impracticability of randomly allocating students to diverse treatments or interventions. In such contexts, quasi-experimental designs emerge as an essential methodological alternative.

Nevertheless, the control group lacks complete control over external variables that could potentially impact the execution of the experiment, as stated by (Sugiyono, 2013). The experimental group is treated with specific treatments with controllable conditions (Rogers et al., A., 2020). This statement means in a quasi-experimental research design, an experimental group is established to receive a specific treatment or intervention. This treatment is intentionally administered with the purpose of carefully examining its effects. Notably, the

researcher has the ability to manage and regulate the conditions surrounding the administration of the treatment. This control ensures a measure of uniformity and comparability among the participants within the group. This approach permits researchers to create a controlled environment in which the outcomes of the treatment can be observed in a systematic manner. While this method lacks the complete randomness associated with a randomized controlled trial, it endeavors to uphold validity and the potential to draw meaningful conclusions within the complexity of the research setting.

Walser also concurs that a quasi-experimental design is appropriate in educational research to which the classes have already been assigned (Walser, 2014). It is difficult to avoid the natural setting of the classroom in educational study. As a result, the quasi-experimental design will be used in this study to accommodate the class participants who are already part of the group due to pre-existing characteristics.

The selection of a quasi-experimental design for this study was influenced by several factors: (a) administrative constraints imposed by the chosen school, which prohibited random selection; (b) the inherent complexity of human behavior and language learning, making it impractical to conduct the study using a true experimental design and define various variables involved in language learning; (c) the ability of quasi-experimental design to reflect real-life settings without disrupting the educational context, thus enhancing ecological validity; (d) the compelling nature of quasi-experimental research results, as emphasized by (Bryman, 2016) in the context of evaluation studies; and (e) the use of intact classes in quasi-experimental designs, which helps mitigate potential threats that can arise when subjects are randomly assigned, as noted by (Brumfit, 1983) in cooperative lesson periods.

The nonequivalent before-after design will be used in this quasi-experimental study. A nonequivalent design is one of the designs in a quasi-experimental. The nonequivalent design is used in this study for several reasons: first, there will be two groups (experimental and control); second, both experimental and control groups will receive the pre-test and post-test; third, the DRTA treatment will be

given only to the experimental groups; and finally, the participants will not be chosen at random. The following is a diagram of this quasi-experimental study.

**Table 3. 1 Quasi-experimental Design**

<b>Groups</b>	<b>Pre-test</b>	<b>Treatment</b>	<b>Post-test</b>
Experimental	O <sub>1</sub>	X	O <sub>2</sub>
Control	O <sub>1</sub>	-	O <sub>2</sub>

*Source: (Cohen et al., K, 2007)*

X: The exposure of a group to an experimental variable

O: The process of observation measurement

According to the table above, both classes will take the same test: pre-test and post-test, but they will be treated differently. In this design, O<sub>1</sub> represents the pretest, X represents the treatment implemented, and O<sub>2</sub> represents the post-test (Cohen et al., K, 2007). Therefore, both experimental and control groups completed the pretest and post-test. Nevertheless, only the experimental receives treatment while the control group uses another method, Genre Based Approach (GBA). Through this design, the sample was taken from two available classes, and each class was assigned to the experimental and control groups. Since this study attempted to find out the significance of the use of the DRTA strategy in experimental and control groups, the researcher believed this design is suitable to use in this research.

### **3.2 Research Variables**

The independent variable of this study was the use of the Directed Reading Thinking Activity strategy. Meanwhile, the dependent variable of this study was students' reading comprehension. The scores of students' pretests and post-tests

are observed and measured in order to determine the effects of independent variables (the DRTA strategy).

### 3.3 Research Hypothesis

A hypothesis is a statement about the possible outcome of the research (Hatch in (Akyel, 1990)). The hypothesis is an important aspect of this study because it can predict or provide a temporary solution to the research problems. There are two hypotheses, namely the null hypothesis and the alternative hypothesis. The null hypothesis ( $H_0$ ) states that there is no significant difference in the total mean score between the experimental and control groups (Kranzler et al., C. J, 2022). The null hypothesis is represented as follows.

$$H_0 : \mu_1 = \mu_2$$

Meanwhile, the alternative hypothesis ( $H_a$ ) states that there is a significant difference in total mean score between the experimental and control groups (Kranzler et al., C. J, 2022). The alternative hypothesis is represented as follows.

$$H_a : \mu_1 \neq \mu_2$$

$H_0$ : null hypothesis

$H_a$ : alternative hypothesis

$\mu_1$ : control group

$\mu_2$ : experimental group

### 3.4 Sample and Population

This study will be conducted inside the EFL classroom in one of the senior high schools in West Java. The targeted site's location is quite nearby the researcher hence, making it accessible and cost-effective. In regards to the research participants, the population of this study is particularly ten-grade students. As for the samples, there are approximately 60 students who are coming from two classes. The researcher assigned class X-3 as an experimental group (which applies the DRTA strategy) and class X-1 as a control group (which does

not apply the strategy) to identify whether the DRTA strategy can help students to master reading comprehension.

Since the study will be conducted during the teaching practice (PPL) program, the accessibility to conduct research in that school was highly considered. Gall, et al., stated that the specific school could be chosen because it is accessible, feasible, and appropriate for conducting this study in terms of time, mobility, and skills (Gall et al., J. P., 1996). The research would be conducted in two classes which are namely the control and treatment groups. The treatment group would experiment with using the DRTA as a strategy inside the classroom. Meanwhile, the control group would receive the GBA as a learning method in a classroom.

### **3.5 Data Collection**

According to (Fraenkel et al., H. H, 2012), "data " refers to the types of information that the researcher obtains on the subject of the research. The data in this research were obtained through a reading comprehension test (pre-test and post-test). The pre-test and post-test were used because it is suitable for the quasi-experimental research design since quasi-experimental designs aim to examine the effect of an intervention or treatment on the outcome variable. Pre-tests provide a baseline measurement, and post-tests assess the outcome after implementing the intervention or treatment. The pretest and post-test were administered to the participants to see whether there were differences in students' reading achievement before and after the treatments were accomplished. By comparing the pre-test and post-test scores, researchers can evaluate the change or improvement that occurred as a result of the intervention.

### **3.6 Research Instrument**

This quasi-experimental research employs research instruments to collect data that are further used to answer the research questions of this study. The research instrument used in this research is a reading comprehension test that is divided into a pretest and a post-test. For assessing reading comprehension there

are some aspects which can be used to make the instrument of the test. The questions was adapted by researchers based on Brown's statement. According to (Brown, 2003), the features of reading comprehension are: 1) main idea, 2) expression/idiom/phrases in context, 3) inference (implied detail), 4) grammatical features detail, 5) stated and unstated details, 6) supporting ideas, 7) vocabulary in context. The reading test given consisted of twenty multiple choices of reading comprehension tests for each pre-test and post-test.

### **3.6.1 Pilot Test**

A Pilot test is pre-testing or trying out a particular research instrument (Baker, 1994). This test was conducted to test the instruments before the instruments were used in the study. The pilot test was done in another class to investigate the instruments' validity and reliability. The test was given to thirty students who were not included in the experimental and control groups but were still at the same grade. In the pilot test, the students were given a reading test that included multiple-choice questions. Below is the assumption for the validity test:

**If the Significance (P-Value) < 0, 05: It means the instrument is valid.**

**If the Significance (P-Value) > 0, 05: It means the instrument is invalid.**

Meanwhile, for the reliability test, the assumption is that Cronbach's alpha coefficient should be greater than 0,70 for good reliability of the scale.

### **3.6.2 Reading Pre-test and Post-test**

The quantitative data will be derived from the students' reading scores. These reading scores will be determined by two tests: the pre-test and the post-test. In regards to the text type used for the pilot test, pre-test, and post-test, this study employed the narrative text since the students are learning this text during the period of the study. Narrative texts are particularly suitable for the Directed Reading-Thinking Activity (DRTA) strategy because inherently contain elements that encourage prediction, reflection, inference, and critical thinking. As for the type of questions, both pre-test and post-test are focusing on three reading micro

skills, they are understanding the meaning and ideas presented in the text, Analyzing and evaluating the text's content and arguments, also drawing conclusions or making the guesses based on the information provided in the text.

The reading pre-test and post-test justification is based on student's weak answers in mentioned micro skill question during the pilot test. Both of the test administered to both the control and experimental groups. The pre-test administered prior to treatment, and the post-test administered following treatment. The reading pre-test will be used to determine whether or not the experimental and control groups have the same ability level. After six weeks of the experiment, there will be a posttest conducted for the participants in order to see the difference that the DRTA strategy could make inside the classroom. The implementation of each meeting was observed to see the implementation procedure of the DR-TA strategy, which was provided by a lesson plan and a procedure. The reading post-test will be used to determine whether or not there is a significant difference in pre-test and post-test scores.

### **3.7 The Procedure**

The research was conducted in one senior high school in Bandung, with one meeting for the pilot test, two meetings for doing the pretest and posttest, and five meetings for implementing the treatment. The time allocation for each meeting is 2x45 minutes. A pretest was administered after the instruments were considered to be valid after the pilot test. Pre-test and post-test were delivered to both experimental and control groups. The experimental group used the Directed Reading Thinking Activity (DRTA) strategy as a treatment. In contrast, the control group did not receive the treatment, yet the researcher used GBA as a method of teaching in a classroom. Further, the data were compared in order to find out whether there was a significant difference in student scores between a group that received the DRTA strategy and a group that did not receive the treatment.

### 3.7.1 Administering Pilot Test

In order to find out whether or not both the pretest and post-test have content validity, the instruments can be tested by administering the pilot test. The pilot test was conducted before giving the pretest. The importance of conducting the pilot test is to help detected any possible flaws at the early stage by identifying potential problems and areas that may require adjustments in the instrument (Van Wijk, E., & Harrison, T, 2013). The pilot test was done in another class to investigate and get the validity and reliability of the instruments. The test was given to thirty students who were not included in the experimental and control groups but were still at the same grade.

### 3.7.2 Administering Pretest

As the first step of the study, a pretest was given before doing the treatment. It was conducted in both experimental and control groups. The pretest was administered by using a reading test. Both experimental and control groups were asked to answer the questions. Furthermore, the pretest aimed at investigating whether or not the students from both groups are equal in terms of test results before receiving the treatment.

### 3.7.3 Conducting Treatment

In this study, the experimental group was treated using directed reading thinking activity techniques, while the control group was not treated using DRTA strategies. The GBA method was implemented in the control group. Even though the methods were different, the teaching materials were similar. This research had two types of lesson plans in this research; the experimental group and the control group. There were four meetings conducted in both experimental and control groups. The duration of each meeting was 90 minutes (2 x 45). The details of each meeting are explained as follows.

**Table 3. 2 The Scheme of the Treatment**

Meeting	Date	Topic
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1	29 March 2023	Pilot Test
2	5 April 2023	Pre-Test
3	3 May 2023	Treatment
4	10 May 2023	Treatment
5	17 May 2023	Treatment
6	24 May 2023	Treatment
7	26 May 2023	Post-Test

*Source: Researcher's Data*

### 3.7.4 Administering Post-test

The post-test was administered to the research participants after the whole treatment had been implemented. The post-test was administered to both experimental and control groups. The test aimed to find out whether or not there were significant differences between scores gained by the students of experimental and control groups after implementing the treatment. Furthermore, the questions used in the post-test have the same quality as the pretest questions.

### 3.8 Data Analysis

The collected data were analyzed to answer the research questions and find out the result of this study. The data analysis included the scoring techniques, the data analysis on the pilot test, and the pretest and post-test data analysis. SPSS 25 was used to analyze the data.

#### 3.8.1 Scoring Technique

Both the pretest and post-test are administered in the form of multiple-choice questions. Pretest and post-test consist of 20 questions. The correct answer for each question is given a 5 score, and the incorrect answer is given a 0 (zero) score.

$$\text{Students' final score} = \text{student's raw score} \times 5$$

After getting all of the students' scores, the researcher compared the result of the pretest and post-test using SPSS to know whether there was any improvement after applying the DRTA strategies.

### **3.8.2 Data Analysis on Pretest and Post-test**

To analyse the data, the researcher employed descriptive statistics and inferential statistics to examine any improvement concerning students' reading comprehension ability or not. Independent and dependent (paired) sample t-tests were used to respond to the research question and reach a conclusion. The Independent sample t-test formula was used to analyse the results of the student's scores on the reading post-test. Therefore, the data will be analysed using normality distribution and homogeneity of variance test. After that, the researcher will continue using independent t-tests, dependent t-tests, and effect size. Then, inferential statistics in the form of a paired-sample t-test was employed to assign meaning to the difference in those means. The SPSS (Statistical Product and Service Solution) for Windows and some statistical formulas will be used to analyze each data set. Following the collection of pre-test scores from the experimental and control groups, some procedures to fulfill the quantitative analysis requirement will be carried out. The first step is to state the normality, homogeneity, and t-test hypotheses. The normality and homogeneity test is computed in the second step. The normality and homogeneity test is used to determine whether the data from the experimental and control groups are normal and homogeneous. When the data findings show that the data is normal and homogeneous, the t-test or pre-test can be computed. The t-test is defined by (Hatch, E & Farhady, H, 1982) as a tool for comparing the means of different groups. In this study, a t-test will be calculated to see if there is a significant difference between the mean scores of students in the pre-test and post-test. Analyzing the reading post-test score follows a similar procedure to analyzing the pre-test score. The t-test can determine whether both the experimental and control groups have the same ability based on pre-test results. On the other hand, the post-

test t-test results could answer the effect of the DRTA method and non-DRTA method treatment on students' reading ability.

### 3.8.3 Normality Distribution Test

This test is performed to determine whether the experimental and control group data are normally distributed. The statistical calculation of the normality distribution test used the Shapiro-Wilk test with SPSS. The Shapiro-Wilk test assumes that the data are independent and come from a normally distributed population. The Shapiro-Wilk test performs well with smaller sample sizes, typically up to around 50 observations, and it's commonly used when testing for normality in parametric statistical analyses, such as t-tests and analysis of variance (ANOVA) (Field, 2013). According to (Chakravarti et al., 1967), this test is used to decide if the sample comes from a population with a specific distribution. The steps are described as follows.

- 1) Setting the level of significance ( $p$ ) at 0.05 and establishing the hypothesis as follows:

$H_0$  : the scores of the experimental and control groups are normally distributed

$H_a$  : the variances of the experimental and control groups are not normally distributed

- 2) Analyzing the normality distribution with Kolmogorov-Smirnov test in SPSS 25 for Windows.
- 3) Comparing the Asymp.sig with the level of significance ( $p$ ) for testing the hypothesis. If the Asymp.sig is more than the level of significance (0.05), the null hypothesis is accepted, while the alternative hypothesis is rejected. It means that the data are normality distributed.

### 3.8.4 Homogeneity of Variance

The variance homogeneity test was conducted to find out whether the two groups in the t-test were equal or approximately equal (Coolidge, 2000). The homogeneity of variance test used the Lavene test in SPSS 25 for Windows. The steps are described as follows.

1. Setting the level of significance ( $p$ ) at 0.05 and establishing the hypothesis as follows:  
 $H_0$  : the variances of the experimental and control groups are homogenous  
 $H_a$  : the variances of the experimental and control groups are not homogenous
2. Analyzing the homogeneity of variance by using the Lavene test.
3. Comparing the Asymp.sig with the level of significance ( $p$ ) for testing the hypothesis. If the Asymp.sig is more than the level of significance (0.05), the null hypothesis is accepted, while the alternative hypothesis is rejected. It means that the scores are homogenous.

### 3.8.5 Independent T-test

The purpose of conducting an Independent t-test is to ascertain if there is a statistically significant difference between the means of two groups, as outlined by (Kranzler et al., C. J, 2022). The purpose of the independent t-test is to determine the significant difference between the experimental and control groups' means on the dependent variable (Coolidge, 2000).

If the probability  $> 0.05$ ,  $H_0$  is accepted

If the probability  $< 0.05$ ,  $H_0$  is rejected

The procedures of testing the independent t-test were as follows.

1. Setting the level of significance ( $p$ ) at 0.05 and establishing the hypothesis as follows:

$H_0$  : There is no significant difference between the means of the two independent group.

$H_1$  : There is a significant difference between the means of the two independent group.

2. Analyzing the independent test by using SPSS 25 for Windows.
3. Comparing the Asymp.sig with the level of significance (p) for testing the hypothesis. If the Asymp.sig is less than the level of significance (0.05), it can be concluded that there is a significant difference between the means of these two samples; on the other hand, the null hypothesis is rejected.

### 3.8.6 Paired Sample T-test

A paired sample t-test is a statistical test used to compare the means of two related or paired groups. It is also known as a dependent sample t-test or a paired difference t-test. The paired sample t-test is used to determine whether there is a statistically significant difference between the means of two related groups on a continuous outcome variable (Field, 2013).

If the probability  $> 0.05$ ,  $H_0$  is accepted

If the probability  $< 0.05$ ,  $H_0$  is rejected

The procedures of testing the independent t-test were as follows.

1. Setting the level of significance (p) at 0.05 and establishing the hypothesis as follows:

$H_0$  : There is no significant difference between students' scores of experimental and control groups

$H_1$  : There is a significant difference between students' scores of experimental and control groups
2. Analyzing the independent test by using SPSS 25 for Windows.
3. Comparing the Asymp.sig with the level of significance (p) for testing the hypothesis. If the Asymp.sig is less than the level of significance (0.05), it

can be concluded that there is a significant difference between the means of these two samples; on the other hand, the null hypothesis is rejected.

### 3.8.7 The Calculation of Effect Size

The effect size here refers to the effect size calculated in the independent t-test of the research. Furthermore, the calculation of the effect size is essential to be administered to determine the effect of the influence of an independent variable upon the dependent variable (Coolidge, 2000). The formula for effect size is as follows.

$$r = \sqrt{\frac{t^2}{t^2 + df}}$$

Where:

$r$  : effect size

$t$  : t obtained from the calculation of independent t-test

$df$  : degree of freedom

(Coolidge, 2000)

After the value of effect size was calculated, the score was matched with the following scale.

**Table 3. 3 Effect Size Value**

Effect Size	r Value
Small	0.100
Medium	0.243
Large	0.371

Source: Coolidge (2000)