

CHAPTER III

RESEARCH METHOD

A. Research Design

The research design refers to a strategy to integrate the various components of a research project cohesively and coherently. According to (Sugiyono, 2019), the research design is a way to collect data systematically where the research has valid data. Valid data is accurate, reliable, and objective, where the researchers manage the data. Research designs include experimental designs, correlations, surveys, reviews, etc. In this research, the researcher used an quasi-experimental design to determine whether or not there was an effect of using TikTok videos as a medium that could improve students' writing skills at MA Negeri 1 Metro. Sugiyono, (2019), states that the experimental research design is a research approach carried out with experiments and is quantitative. The purpose of quantitative research is to ascertain the link between the independent and dependent variables in a population that is utilized to determine how a treatment affects others under restricted circumstances (Faliyanti & Sari, 2018). The design used in this study is a proper experimental design with a pretest-posttest control group design. According to (Sugiyono, 2019), the research design is described in the table below:

Table 3. 1

Table of Research Design

Group	Pre-test	Treatment	Post-test
Experimental Group	O_1	X_1	O_2
Control Group	O_3	X_2	O_4

Source (Sugiyono, 2019)

Note :

$O_{1,3}$ = Pre-test

$O_{2,4}$ = Post-test

X_1 = TikTok Video

X_2 = Conventional Technique

The description above explains that the researcher gives a pre-test for the experimental and control classes. The purpose of providing the pre-test is to

find out the student's ability to write analytical exposition texts. Researchers give tests before treatment in the experimental or control classes. The researcher treated the experimental class X1 Treatment using TikTok video and control class X2 Treatment with conventional technique. After the treatment, the researcher gave a post-test to measure students' scores in writing analytical exposition texts in the experimental and control classes.

B. Research Variables

Hardani et al., (2020) state that variables are characteristics inherent in the population to be studied and recorded or of research concern. Variable comes from the fact that specific elements can vary among objects in a population. In this study, researchers used two kinds of variables, namely:

1. Independent variable

Independent variables are variables that theoretically could have an impact on other variables (Hardani et al., 2020). This variable is the primary variable used by researchers in their research. In this study, the independent party whose variable is using TikTok videos is denoted by "X."

2. Dependent variable

According to (Hardani et al., 2020) , the dependent variable is a variable that can reflect changes in scientific concepts due to changes in other variables or variables that are influenced by the independent variable. Other variables can affect this variable, but the dependent variable itself cannot change other variables. In this study, the related variable is the students' writing ability to write exposition analytical texts, denoted by "Y."

C. Research Population, Sample, and Sampling Technique

a. Research Population

The population is a collection of objects or subjects with the quantity and characteristics determined explicitly by researchers to study and draw conclusions from them (Sugiyono, 2019). According to (Hardani et al., 2020), all individuals, animals, plants, objects, symptoms, test scores, or events that are different but have the same characteristics used as a data source for research are called populations. The subject of this study is

students of class XI MA Negeri 1 Metro for the 2022/2023 school year with 306 students.

b. Research Sample

According to (Sugiyono, 2019), the sample is part of the number and characteristics possessed by the population. Hardani et al., (2020), argue that the sample is a portion of the population taken using a sampling technique. The samples taken must be representative. The conclusions of the research results will be correct if they are correct. In this study, the researcher chose two classes as samples. Researchers used random sampling techniques to select classes.

In the social science class, there are five classes, and in the social science class, there are three classes. To choose the experimental class and the control class the researcher used a random sampling technique, and the selected classes were class XI IPS 1 and XI IPS 2. The specified class was XI IPS 1 as the experimental group and class XI IPS 2 as the control group of MA Negeri 1 Metro, totalling 76 students..

Table 3. 2

Table sample research

Experiment group (IPS 2)	38
Control group (IPS 1)	38
Total	76

Source: Data of students of class XI IPS MAN 1 Metro

3. Sampling Technique

Hardani et al., (2020) stated that technical sampling is the process of selecting a sample that is the right size for the population to be studied so that the sample can accurately represent all the characteristics and distribution of the population. In this research, researchers will use simple random sampling, a sampling technique from a randomly selected population, without looking at the position in that population.

The researcher obtained a sample of two classes, namely class XI IPS 1 as the experimental group and XI IPS 2 as the control group, using a simple random sampling technique, namely by:

- a. The researcher writes the number on the pieces of paper, each paper is written for IPA class 1,2,3,4,5 and IPS class 1,2,3
- b. The paper is rolled up and put in a glass
- c. The glass is shaken until one roll comes out. The first roll is class XI IPS 1 as the experimental group
- d. The second roll of paper is class XI IPS 2 as the control group.

D. Research Instruments

According to (Arikunto, 2021) research instrument is a tool use to measure observed natural and social phenomena. In this research, the researchers use the test as an instrument in the form of a written test. The researcher conduct the test twice, using the pre-test and post-test to collect data.

1. Pre-test

The pre-test is carried out to provide a measure or assess the ability of basic knowledge or topics to be tested by students before they receive treatment (Magdalena et al., 2021). The pre-test is a test given to students to find out how far students are ready to accept learning. The researcher gave a pre-test to class IPS 1 as an experiment and IPS 2 as a control class. In providing the pre-test, the researcher asked the students to write an analytical exposition text.

2. Post-test

The post-test is used to measure how much has changed or to determine the extent to which students understand the trial topic after the treatment is carried out (Magdalena et al., 2021). The post-test was carried out after the treatment was carried out in the experimental class and control class. This treatment was given to experimental class students using TikTok videos, while the control class did not use TikTok videos. The results after the post-test are used to compare the results of the students' pre-test. Post-test to find out students' progress level in writing analytical exposition texts.

E. Validity And Reliability

1. Validity

- a. The Concept of Validity

Instrument validity is a measuring tool used to obtain valid data (Sugiyono, 2019). That means using this validity test will determine whether the test performed is valid or invalid. According to (Middleton, 2020) says that the extent to which the results measure what should be measured. In this case, the content and constructs are used to measure whether or not the test has good validity.

Content validity refers to the extent to which a test can be measured precisely according to the features for which the test was designed. Content validity is based on careful examination of textbooks, syllabus, objectives, and assessments from subject experts according to the curriculum used. In this case, the aim is to check whether the test to be carried out will present the material properly and optimally. In this study, the researcher used material about analytical exposition text taught in eleventh grade in the first semester. The researcher uses the syllabus and lesson plans on the attachment sheet as a reference, and the researcher uses expert assessment to check how well results fit with accepted theories and other indicators of the same concept.

b. Expert Assessment

According to (Middleton, 2020), validity assessment examines how well the results conform to the established theory and other measures of the same concept. Construct validity is focused on what will be measured, namely the ability to write analytical exposition text. This study developed a writing test to measure students' ability to write analytical exposition texts based on the rubric criteria for assessing analytical exposition texts. It consists of text content, grammatical, and punctuation. The instrument was consulted with Mr. Dr. Dedi Turmudi, M.A TESOL, as a writing subject lecturer and Mam Lilis Odiah, S.Pd, as an English subject teacher at MA Negeri 1 Metro to ensure the instrument was valid.

2. Reliability of the Test

Middleton, (2020) argue that reliability is the extent to which results can be reproduced when the study is repeated under the same conditions. It can be interpreted that the reliability of this instrument when

used several times to calculate the same object, will produce the same data.

In this study, the researcher use Spearman Brown (split half) formula. This is used to assess the consistency of a test over time to make it more reliable by taking the following steps:

- a. provide test evaluators to students
- b. average fair assessment results from rater I and rater II
- c. divide the score into the first score and the second score
- d. the correlation between the first and second scores using the product moment.

The formula Spearman Brown (Spilt Half) as follows:

$$r_{xy} = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{(N \sum x^2 - (\sum x)^2) \{N \sum y^2 - (\sum y)^2\}}}$$

Where :

- r_{xy} : item of test reliability
 N : the number of the sample
 $\sum x$: the sum of x score (odd items)
 $\sum y$: the sum of y score (even items)
 $\sum xy$: sum of the result of X and Y for each student
 $\sum x^2$: sum of score X2
 $\sum y^2$: sum of score Y2

The results of the product-moment formula are analyzed using the Spearman-Brown formula as follows:

$$r_{11} = \frac{2(rxy)}{1 + rxy}$$

- r_{11} : coefficient of the reliability of entire test
 rxy :coefficient of the rliability of half test (rxy)

Table 3. 3
Score Criteria

Interval Coefficient	Correlation
0,00-0,199	Very Low

0,20-0,399	Low
0,40-0,599	Medium
0,60-0,799	High
0,80-1,000	Very High

(Sugiyono, 2019)

From the table above, the reliability calculation is known to be 1,000, which means that the reliability is very high so that the test can be used for data collection.

F. Data Collecting Technique

1. Pre-test

- a. Preparing pre-test, treatment, post-test, and research instruments. The researcher choose many test items according to the students' conditions.
- b. Giving pre-tests to students where researchers gave pre-tests to the experimental and control groups.
- c. The test to be given is in writing an analytical exposition text with several criteria, such as at least every generic statement is filled in, the topic given following the title given by the researcher, and students must complete it within 40 minutes.

2. Treatment

- a. Giving treatment to students by using TikTok videos according to the theme given.
- b. For the experimental group:
 - 1) The researcher explaining the analytical exposition text material.
 - 2) The researcher introducing the media used for learning to write.
 - 3) The researcher teaches writing analytical exposition texts to the experimental group.
- c. For the control group:
 - 1) The researcher explaining material about text analytical exposition to students.
 - 2) Researchers teaching writing analytical exposition texts to the control group without using TikTok videos.

3. Post-test

- a. Giving a post-test to students. The researcher gave a post-test after the pre-test and completed treatment.
- b. Giving tests about writing analytical exposition texts with several criteria. At least every generic statement is filled, and the topic is based on the title the researcher gave. Students must complete it within 40 minutes.

G. Data Analyzing Technique

After acquiring the data, the researcher determine the data. The normality test, homogeneity test, and formula hypothesis test were the three tests that were carried out by the researchers. The following are the processes for processing the data that was collected:

1. Normality test

The normality test aims to determine whether the two groups come from normally distributed populations and whether, in a linear regression model, there is a correlation between the confusing error and customarily distributed residuals (Arikunto, 2021). In this normality test, the data must be normally distributed. The t-test and f-test assume the residual values follow a normal distribution. This normality test is used to determine whether the data to be analyzed is normally distributed or not.

The normality test uses the Chi-square formula, which is used to analyze the normality of the distribution.

The hypothesis formula:

Ho: The sample comes from a normally distributed population.

Hi: The sample does not come from a normally distributed population.

Statistic Formula :

(Arikunto, 2021)

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

Notes:

X^2 : Chi-square

O_i : frequency observes

E_i : frequency expectation

k : interval class

The criterion, if Asymp.sig.(2-sided)>0,05 the data is normal.

In practice, the chi-square distribution is applied to the chi-quadrat test. This test is to test the relationship or influence of two nominal variables, measure the strength of the relationship or influence of two nominal variables, and measure the strength of the relationship between one variable and another nominal variable. The conditions for using this test are data in standard form; there are two or more variables, and there are no cells with a real frequency value, also known as the actual count (F0) of 0 (zero).

2. Homogeneity Test

Supena et al., (2021) state that the homogeneity test aims to determine whether the variance between the control and experimental groups is homogeneous or heterogeneous. Homogeneous means that the data of the two groups have the same variance. The homogeneity test is used to determine whether some population variants are identical.

Hypotesis Formula :

$H_0 : \sigma_1^2 = \sigma_2^2$ both sample have the quality of variants.

$H_1 : \sigma_1^2 \neq \sigma_2^2$ both of sample have different variants.

The used statistic formula of the test is:

$$F = \frac{\text{biggestvariants}}{\text{smallestvariants}}$$

The test criterion:

Accepted H_0 if $F_{ratio} \geq F_{\frac{1}{2}a}(V_1-V_2)$, with $V_1 = n_1-1$ and $V_2 = n_2-1$.

In this study, researchers use the F-test because the F-test can carry out the homogeneity test of variance for the two sample groups. The F-test aims to determine whether the independent variables (stimulants) affect the dependent variable. The F-test was conducted to see the effect of all variables on the specified variable.

3. Hypothesis Test

Sugiyono, (2019) state that the t-test with two samples aims to compare the two data and determine whether the variables are the same

or different. The t-test shows how far the influence of one independent variable individually explains the variation of the dependent variable.

In this study, researchers used an independent sample t-test. This test is a statistical test that develops the average of two independent sample groups. An independent sample t-test was used to see if there was a statistically significant difference between the two groups in the means. It should be reminded again that the two groups must be unrelated or called independent. Researchers use this test because the subjects or research samples differ between the control and experimental classes. Therefore the test that is suitable for use is the independent sample t-test.

The hypothesis formula are:

Ha: There is a significant influence of using TikTok video on students' writing ability at the eleventh grade at MAN 1 Metro.

Ho: There is no a significant influence of using TikTok video on students' writing ability at the eleventh grade at MAN 1 Metro.

To decide which hypothesis is accepted or not accepted, use the t-test formula used to compare two samples. The t-test formula is as follows:

$$T - count = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2} \left(\frac{2}{n_1} + \frac{2}{n_2}\right)}}$$

Notes:

\bar{x}_1 : the mean value of the first sample group.

\bar{x}_2 : the mean value of the second sample group.

n_1 : first sample group size.

n_2 : second sample group size.

S_1 : the standard deviation of the first sample group.

S_2 : the standard deviation of the second sample group.

Before using t-test formula the researcher determine the average variant (S^2). The variant (S^2) is calculated by the formula :

$$S^2 = \frac{(N_1 - 1)S_{\frac{1}{2}} + (N_2 - 1)S_{\frac{2}{2}}}{N_2 (N_2 - 1)}$$

Notes:

N_1 : number of students' in the experiment class.

N_2 : number of students' in the control class.

$S_{\frac{1}{2}}$: variant of experiment class.

$S_{\frac{2}{2}}$: variant of control class.

S^2 : variant.

Criteria for acceptance of hypothesis testing there are 2 ways they are as follows:

1. H_0 is accepted if t-ratio < t-table

H_a is accepted if t-ratio > t-table

2. H_0 is accepted if sig.(2-tailed)>0.05

H_a is accepted if sig.(2-tailed)<0.05

In the explanation above, the researcher concludes that the hypothesis is an assumption about population parameters. H_0 stated that the hypothesis was that there was no relationship between two or more variables or no difference at all between one group and another. H_a states that there is a relationship between two or more variables. The expected conclusion is statistical in the form of an accepted alternative hypothesis. The researcher chose to use the independent sample t-test because the sample used by the researcher was divided into two different groups. That is the group that was given the treatment and the group that was not.