CHAPTER III
RESEARCH METHOD

A. Research Design

Research design refers to the overall plan or framework that guides the process of conducting research. “Research designs are plans and techniques for conducting research and they range from general hypotheses to specific approaches to data collecting and analysis” (Creswell, 2009). It outlines the methods, procedures, and techniques to be used in gathering and analyzing data to address a specific research question or objective. The design of the research is Quantitative-Quasi Experimental Design. “The objective of experimental research is to identify whether a particular treatment has an impact on an outcome” (Creswell, 2009). These outcomes are assessed by giving special treatment to one group and not giving special treatment to the other group and then determining how both groups score.

Quantitative research refers to survey and experimental research that identifying samples and populations, choosing investigative strategies, gathering and analyzing data, presenting findings, and providing interpretations. “Quantitative methods involve the processes of collecting, analyzing, interpreting, and writing the results of a study” (Creswell, 2009). The objective of quantitative research is to gather and analyze numerical data to make generalizations and come to conclusions about a population or phenomenon. It entails the utilization of structured data collection instruments, such as surveys, questionnaires, or experiments.

“In experimental research involves two groups, namely experimental groups and control group” (Faliyanti, 2017). In this research, the researcher designed one group as an experimental class and the other group designed as a control class. The researcher utilized the Study Set feature within the ELSA application as a teaching tool in the experimental class, contrasting it with conventional teaching techniques employed in the control class. The table of research design as follows:

Table 1 Research Design

Class	Pre-Test	Treatment	Post-Test
A	O1	X	O2
B	O3	-	O4

(Sugiyono in Asrowi et al., 2019)

Note:

A : Experimental Class

B : Control Class

O1, O3 : Pre-Test

X : Study Set in ELSA App

- : Conventional Teaching Technique

O2, O4 : Post-Test

B. Research Variable

Variables are characteristics, attributes, or properties that can change or be changed. It is a measurable or observable quantity that can take on different values depending on the person, object, event or situation. Variables are used to study and understand relationships, patterns, and influences in research studies. According to Oyebanji (2017) “There are two types of research variables, Independent Variables and Dependent Variables”. An independent variable is an input variable that, in part as a whole, causes a certain result. It is a stimulus that influences a factor that can be manipulated (e.g., under experimental or other conditions) to influence a response, prognostic, or outcome (tied). A dependent variable is an outcome that is influenced, either wholly or partially, by an independent variable. Based on the description, the variables of this research as follow:

1. Independent Variable/(X) will be using Study Set in ELSA App
2. Dependent Variable/(Y) will be Students’ Pronunciation

C. Research Population, Sampling Technique and Sample

1. Population

Population refers to an entire group of individuals, objects, or events that share common characteristics. According to Winarto (2018) “Population can be expressed as a collection of objects or research data sources”. Based on the previous statement, the researcher concluded that the population is defined as a

group of people, objects or events that are used as a source of research data. Therefore, the population in this research is tenth grade students at Madrasah Aliyah Muhammadiyah of Purbolinggo. There are 2 classes, 20 students in 10.1 and 20 students in 10.2. Total the population of this research is 40 students.

2. Sample Technique

In this research, the researcher chose the Total Sampling Technique as a technique in selecting samples. Total sampling technique where the number of samples is the same as the population (Sugiyono, 2013). The selection of this sampling technique is justified by the composition of the population, which comprises 40 students allocated across two classes designated respectively as the experimental and control groups. The steps that used by researcher to determine the experimental class and the control class:

a. Write 10.1 and 10.2 on a piece of paper.
b. The papers roll and then put into the glass.
c. The glass shaken until getting rolling papers out.
d. The experimental class will focus on the roll of paper that comes out first (10.2).
e. The control class will focus on the roll of paper that comes out last (10.1).

3. Sample

“The sample is part of the population that is the focus of our research, within the scope and time that we specify” (Winarto, 2018). Then, determining the sample in research is crucial in research. In this research, the researcher utilized the Total Sampling method to assign the 10.2 class as the experimental group and the 10.1 class as the control group. The experimental class comprised 20 students, while the control class also consisted of 20 students.

D. Research Instrument

A research instrument is a tool used to solve a research question or collect data to achieve a research goal (Winarto, 2018). Research instruments are used to measure the value of research variables (Sugiyono, 2013). Instruments in research refer to the tools, devices, measures, or techniques that are used to collect data or gather information in a systematic and objective manner. These instruments are designed to measure or observe specific variables or phenomena of interest in a research study.

In this research, the research instrument used is a pronunciation test consisting of 30 words using Study Set in ELSA application. “A test is a means or

tool used to gather information in the form of knowledge or skills" (Winarto, 2018). The researcher will conduct the pre-test and post-test in giving the test. A pre-test refers to an initial assessment conducted before the implementation of an intervention or treatment in research. Conversely, a post-test is conducted after the intervention or treatment has been administered to evaluate its effects.

In conclusion, the research instruments is a tools used to obtain data in achieving research objectives. In establishing a research instrument for the students, researchers administered an oral test (pronunciation test) to determine students' pronunciation skills.

E. Validity and Reliability Instrument

1. Validity

"Validity in research refers to the extent to which a study or research instrument measures what it is intended to measure or accurately reflects the construct or phenomenon of interest" (Sugiyono, 2013). It is a critical aspect of research quality and ensures that the findings and conclusions drawn from the study are trustworthy and meaningful. In this research, the researcher used face validity as a validity test. "Face validity is the degree to which a measurement appears related to a particular construct" (Taherdoost, 2017). Face validity is a type of validity assessment that refers to the extent to which a measurement instrument or research method appears, on its face, to measure the construct or phenomenon it intends to measure. It is a subjective judgment made by researchers or experts based on their initial impression or common sense.

Assessing by experts conducted in this validity test to test the validity of the instrument to be used. There are two experts which given the evaluation. The experts reviewed the test instrument on how well the test instrument that given to students. There are five criteria of validation by the experts as follow: (1) Very Poor, (2) Poor, (3) Enough, (4) Good, and (5) Very Good.

2. Reliability

In the other hand the test instrument must be valid; the test instrument must also be reliable. "Reliability in research refers to the consistency and stability of measurements" (Bornstein, 2018) or results obtained from a research study or measurement instrument. Reliability is an essential aspect of research quality because it ensures that the results or measurements obtained are of high quality and can be trusted.

In this research, the reliability that used is internal consistency which uses the Alpha Cronbach with SPSS, while the manual calculation used in the Alpha Cronbach stated by (Nurgiyantoro et al., 2015) as follows:

$$r_i = \frac{k}{(k-1)}\left\{1 - \frac{\sum \sigma i^2}{\sigma^2}\right\}$$

Note:

r_i : The reliability coefficient.

k : The number of questions.

σi^2 : The variant of quentions.

σ^2 : Score variant.

The table of criteria for the Alpha Cronbach reliability test according to (Sutrisno, 2016) as follows:

Table 2 Reliability Criteria

Reliability Index	Criteria
0.81 – 1.00	Very Good
0.61 – 0.80	Good
0.41 – 0.60	Quite
0.21 – 0.40	Poor
0.00 – 0.20	Very Poor

(Sutrisno, 2016, p. 166)

F. Data Collecting Technique

Data collection techniques refer to the methods or approaches used to gather information or data for research purposes. Instruments that have been tested for validity and reliability may not provide valid and reliable data if the Instruments are used incorrectly during data collection (Sugiyono, 2013). The technique is crucial for obtaining relevant and reliable data that can be analyzed to answer research questions or test hypotheses. According to the research design above, this research uses pre-test, treatment, and post-test in data collection techniques.

1. Pre-Test

Before administering treatment to both the experimental and control classes, the researcher conducted a pre-test with the students. A pre-test serves as an initial assessment conducted before treatment is introduced in a research study. Its purpose is to assess the baseline condition of students before any treatment interventions are applied. In the pre-test, students have given (oral test) a pronunciation test consisting of 30 words. In assessing pronunciation, students have given a score 50 - 80 based on pronunciation rubric assessment.

2. Treatment

After conducting a pre-test in experimental class and control class, the researcher will give the treatment to the student in experimental class. The purpose of the treatment is to develop students' pronunciation skills using the Study Set in ELSA. The technique using Study Set in ELSA app and there are three meetings in treatment. Every meeting conducted 45 minutes using Study Set in ELSA app to learning about pronunciation related to the subject in school.

3. Post-Test

A post-test is an evaluation or measurement administered after a treatment has been implemented in this research. It is conducted with students from both the experimental and control classes. The purpose of the post-test is to assess the condition of students after they have undergone the treatment. The questions to be used in the post-test are the same as those used in the pre-test. There are 30 words that must be pronounced by students with the same score calculation as the pre-test.

G. Data Analyzing Technique

Data analysis is a methodology that commonly encompasses various tasks such as data collection, data cleansing, and data organization. “Data analysis mainly includes big data analysis techniques, systematic architecture, data mining and analysis tools” (Abdul-Jabbar & K. Farhan, 2022). The most essential stage in the realm of big data is data exploration, which encompasses the analysis of substantial information, providing suggestions, and utilizing decision support tools that have become increasingly popular, including executive information systems and online analytical processing. In this research, the data analyze using techniques as follows:

1. Data identification. The researcher identified the data based on the students’ score.

2. Calculate the pre-test score.
3. Do the treatment using Study Set in ELSA app to teach pronunciation.
4. Calculate the post-test score
5. Report the result. After conducting all the steps, the researcher makes the conclusion.

The formula that used in the data analyzing technique is normality and homogeneity test.

1. Normality Test

A normality test is employed to assess whether the data collected from a sample originates from a population that follows a normal distribution. In this research, the researchers will use SPSS to test normality. According to (Anwar, 2009) To determine normality, the Sig score can be used which is in the results of the Shapiro-Wilk calculation. The criteria for normality test according to Nurgiyantoro et al., (2015, p. 124) as follows:

a. If the Significant value (Sig) $\geq$ 0.05, the data distribution is normal.
b. If the Significant value (Sig) < 0.05, the data distribution is not normal.

2. Homogeneity Test

Homogeneity test is a type of statistical test used to test whether the variance or distribution of two or more groups or sample data is homogeneous or similar (Widodo et al., 2017). In this research, the researcher used ANOVA with SPSS calculations (Anggara & Anwar, 2017, p. 98) by two criteria as follows:

a. When the significance value is $\geq$ 0, 05 it means homogeneous.
b. When the significance value is < 0, 05 it means not homogeneous.

H. Hypothesis Test

Based on the hypothesis of the research, there are two hypotheses as follows:

1. First Hypothesis

The researcher tested the first hypothesis using the Paired Sample T Test with SPSS. “Paired Sample T Test is a way to test the difference in averages of two samples from the same group and Paired Sample T Test is used when the data is normally distributed” (Anggara & Anwar, 2017). There are two criteria for Paired Sample T Test using SPSS calculation as follows:

a. If the Significant value (Sig) > 0.05, Ho is accepted
b. If the Significant value (Sig) $\leq$ 0.05, Ha is accepted

2. Second Hypothesis

The researcher tested the second hypothesis using the Independent Sample T Test with SPSS. “Independent Sample T Test is a way to test the difference in averages between two samples from different groups and Independent Sample T Test is used when the data is normally distributed and the data is homogeneous” (Anggara & Anwar, 2017). There are two criteria for Paired Sample T Test using SPSS calculation as follows:

a. If the Significant value (Sig) > 0.05, Ho is accepted
b. If the Significant value (Sig) $\leq$ 0.05, Ha is accepted