CHAPTER III

RESEARCH METHODOLOGY

This chapter discusses several things, such as research method and design, data and source data, data collection technique, research instrument, research procedure, and data analysis technique.

3.1. Research Method and Design

In this studied, the experimental design was choosen by the researcher in English class. Because the researcher wanted to gauge the effect of *mentimeter web-based application* to EFL students reading skills. In different aspects, research was essentially a search attempt. Of course, a studied requires a strategy that was suited for achieved a research aim. Overall, the user feedback indicated that research was a process of sought information or knowledge in numerous areas. It recognized that performed a studied necessitates a well-defined approach that was in line with the research objectives. Quantitative was used as an approach in this studied. This studied was conducted in one group, namely an experimental group. This method used a quantitative approach because of the realization and collection of data that could be represented numerically in a structured and detailed manner. The objective is to used this method to obtain accurate measurements and enable statistical analysis. The focus of this quantitative method was on measurable data.

The researcher used pre-experimental design or in another designation was one group pre-test post-test design. Pre-experimental design It's research that gives a pre-test before treatment and a post-test after treatment. With this treatment, researchers can determine whether or not the effect of the variable was being studied by compared the pre-test and post-test averages. These pre-tests and post-tests used the same form of the test but are gave at different times. The differences due to the experimental treatment would be evaluated by compared the pre-test and post-test results. In this studied, the researchers only used one group and used a pre-test and a post-test to evaluate the effectiveness of the treatments. This design was typically represented as follows: O1 X O2 where O1 represented the pre-test, X represents some treatment, and O2 represents the post-test (Salkind, 2010) chart could be described as followed:

Research Design

Pre-test	Treatment	Post-test
O_1	X	O_2

Planning was a group that performs pre-tests, receives treatments, and performs post-tests. The objective of this test was to find out the effects of used *Mentimeter web-based application* to students' reading skills.

3.2. Population and Sample

3.2.1. Population

The population, according to Sugiono (2017:117), "population was a generalization area consisted of objects or subject that has certain qualities and characteristics determined by researchers to studied and then determine conclusions This study's population consists of 97 students. The population in the study was all class X in MA Al-Fatich Surabaya 2023/2024 academic year.

Population of X Students at MA Al-Fatich Surabaya

No	Class	Gender		Total
		Male's	Female's	
1	X-A	30	-	30
2	X-B	-	31	31
3	X-C (integrated)	9	27	36
Total		39	58	97

Source: English education subject teacher

3.2.2. Sample

According to Sugiono, (2017:81) a sample was the portion of the population that was the source of the data in the research, where the population was a part of the number of characteristics possessed by the population. The sampled method was used by researchers used a type of non-probability sampled method with purposive sampled. In this sampled, there were 36 students in one class. Non-probability sampled was a sample-taking technique that does not gave equal chances or opportunities to every

member of the population when they are to be selected as samples (Sugiyono (2018:136)). Meanwhile, purposive sampled techniques are sampled used certain considerations according to the desired criteria to be able to determine the number of samples to be examined (Sugiono (2018:138)).

Sample of Students at MA Al-Fatich Surabaya

Class	The number of students
X-C (integrated)	36

Source: English education subject teacher

3.3. Data Collection Technique

The method used by researchers to obtain research data is known as data collection. Research tools are tools or facilities for data collection. Instrumental research helps researchers in the collection of data, allowing them to be more thorough, complete, and methodical in the processing of their data. In addition, it allows researchers to collect information from larger sample sizes, increasing the generalization of their findings. In this study, one method is used to collect data:

3.3.1. Research Instrument

3.3.1.1. Test

Research instrument refers to any equipment used to collect the data (Arikunto, 2010:262). The researchers used one type of instrument in this research, namely tests. The tests used in this research is a multiple-choice question with a composition of 25 pre-test and post-test questions that have been tested for validity and reliability using SPSS version 23. This test will be offered to evaluate students' ability to read using *mentimeter web-based* learning media.

A test method is a data collection method used to measure a student's skills or abilities by asking questions, doing exercises, or using other tools after the student passes through the learning process. There are pre-tests and post-tests.

A test method is a strategy or tool for conducting research by applying a number questions to be tested or by using other activities that have been chosen well, correctly, and carefully. In this research the test used twenty-five questions recount text with six *mentimeter* models. Multiple choice for number 1-5, open ended models for number

13,14,17,18, and 25, select answer for number 7,12,15,23, and 24, word could for number 8,9,11, and 19, scales for number 10,16,20, and 21, truth or lie for number 6 and 22. Which were designed by researchers to determine student's learning abilities. That is, by multiple-choice, truth or lie, select answer, and open-ended, scales, word could. The test approaches are used to get information about students learning success. This test is also used to determine the impact of using a *mentimeter web-based application* on students learning success.

3.3.1.1.1. Validity Test

According to Ghozali (2019, p. 5) The validity test in a study is used as a measure of whether or not a questionnaire is valid. The validity test is used to find out the measurement level of the instrument's validity. An instrument can be called valid if it is able to determine its level of validity. Instruments are considered valid if they can accurately measure what they intend to measure or disclose data from the variables studied. Validity and reliability tests are used to ensure that the instruments used are able to produce results that are truly accurate and worthy of being used in research. The analysis applied in this study's validity test is to apply a correlation based on people's opinions on each measurement instrument item with a total score that is the sum of each score, and then help to use SPSS Version 23 statistic test. The data is said to be valid if regression correlation value is greather than 0,05.

Item	**R value**	***r* table**	**Category**
1	0.619**	0.312	Valid
2	0.659**	0.312	Valid
3	0.432**	0.312	Valid
4	0.792**	0.312	Valid
5	0.489**	0.312	Valid
6	0.427**	0.312	Valid
7	0.740**	0.312	Valid
8	0.489**	0.312	Valid
9	0.740**	0.312	Valid
10	0.489**	0.312	Valid
11	0.425**	0.312	Valid

12	0.660**	0.312	Valid
13	0.489**	0.312	Valid
14	0.698**	0.312	Valid
15	0.479**	0.312	Valid
16	0.658**	0.312	Valid
17	0.740**	0.312	Valid
18	0.489**	0.312	Valid
19	0.698**	0.312	Valid
20	0.546**	0.312	Valid
21	0.555**	0.312	Valid
22	0.619**	0.312	Valid
23	0.658**	0.312	Valid
24	0.659**	0.312	Valid
25	0.555**	0.312	Valid

This research's implementation begins with a test of 25 questions for samples that have been decided by the researchers. The answers that have been obtained by the researchers at the time of the empirical test, then analyzed their validity and reliability using the SPSS program. Because in this study, the sample used was 40 students using 5% significance, the R-value of the table was 0.312 then a question element is declared valid if the R count value is greater. If the value is less than 0.312, then the question is declared invalid (Results from 25 questions tested resulted in r results getting a score above 0.312 where the minimum value approximately r table is at 0.425 – 0.792 But in conclusion, it's all over the existing limit). Here is the result of calculation of regression correlation with SPSS version 23.

3.3.1.1.2. Reliability Test

Reliability test is used to determine the extent to which the result of a measurement can be trusted. To calculate the reliability test, researcher used *Cronbach's Alpha* using the SPSS version 23 statistical test. The data has a strong confidence level if *Cronbach's Alpha* value is greather than 0.05.

$$rH = \left(\frac{k}{k-1}\right)\left(1 - \sum\frac{\sigma_b^2}{\sigma_1^2}\right)$$

description :

*r*H = instrument reliability

k = number of question items or number of questions

∑ σ 2b = number of variance items

Σ 21 = total variance

Reliability Interpretation Table with Formulas Alpha (Agus Eko Sujianto, Aplikasi Statistik with SPSS 16.0, (Jakarta: PT Prestasi Pustakarya, (2009)).

Here are the results of *Cronbach's Alpha* calculations:

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.903	.932	25

Based on the above reliability test results obtained *Cronbach's Alpha* test value of 0.903. the value of *Cronbach's Alpha* test is more than 0.05 then the data has a high level of trust. Thus in this case the *Cronbach's Alpha* test is more than 0.05, that is 0.903 (Which means that the material can be passed on to the next test to be interpreted, with the result of the interpretation later being considered reliable or can be used as a reference). So it can be concluded that the data has a very high reliability level of confidence.

3.3.1.1.3. Normality Test

The purpose of the normality test in this study is to find out whether the data studied by the researcher is abnormal or not. The method required in the research for the normality test by "Shapiro wilk". A normality test aims to test whether in a regression model, an interfering or residual variable has a normal distribution. A good regressive model is to have a normal or near-normal data distribution. The normal distribution will form a single diagonal straight line and the data ploting will be compared to the diagonal line. If the data distribution is normal, then the actual descriptive line will follow its diagonal line a (Ghozali, 2011: 163).

Researchers used the normality test by Saphiro Wilk because the sample had only 36 participants in the study, which was less than 100 participants. Which means that the pre-test and post-test instruments are normally distributed. In the normality test, the researchers used sig in the Shapiro-Wilk section because the data in the test was less than 50. His test criteria according to Sarjono and Julianto (2011: 64), are as follows:

a) Shapiro Wilk/Kolmogorov-Smirnova test significance sig > 0.05 then shows normal distributed data.

b) The significance of the Shapiro-Wilk/Kolmogorov-Smirnova test sig < 0.05 then shows the data is not normally distributed.

	Shapiro-Wilk		
	Statistic	df	Sig.
PRE-TEST	.944	36	.069
POST-TEST	.947	36	.081

The results of this test show a sig value greater than 0.05, namely pre-test 0.069 and post-test 0.081. Which means that the pre-test and post-test instruments are normally distributed.

3.4. Data Analysis Technique

According to Sugiyono (2011:244) data analysis is the process of searching and compile systematically data obtained from interviews, field notes, and documentation by organizing data into categories, describe into units, synthesize, arrange into the pattern, choose what is important and what will be learned, and make conclusions so easily understood by yourself and others.

The researchers used parametric statistics, Parametric statistics are often used to assess population size as opposed to sample data or to test a population's parametric using statistics. Since the tested data is distributed normally, the statistical tests performed are parametric tests. By knowing the normality test of the data distribution, the statistical determination of the already normally distributed parametric is qualified that the sample distribution is taken from the normal distributed population distribution and the randomly obtained sample. The parametric statistics used are the Student T-

Test, which is a comparative test to assess the difference between a given value and the average of a population group. The test is designed to test a hypothesis, and the obtained data will be statistically examined.

3.4.1. Hypothesis test

In the hypothesis test, the researchers used the T-test to understand the influence of group discussion strategies on the ability of students to read with the IBM SPSS version 23 calculation tool. According to Widiyanto (2013:35), paired sample T-test is one of the test methods used to study the effectiveness of treatment, marked by the difference between the average before and after treatment. Paired sample T-test is a separate test of two pairs of samples. Coupled samples are the same subjects, but are treated differently. This study uses pairs of samples, i.e. we use the same sample, but the tests are done on the samples twice at different times or at certain time intervals. The test was performed using a significant 0.05 (α=5%) between independent variables and dependent variables.

The reason the researcher used this analytical tool was because in this study two pairs of samples were used. These pairs of samples are the same subject but undergo two different treatments or measurements. Here is the paired t-test formula:

$$t \frac{\overline{D}}{\left(\frac{SD}{\sqrt{\overline{N}}}\right)}$$

t = Calculated t value

$\overline{D}$ = Average measurements for samples 1 and 2

SD = Standard deviation of sample measurements 1 dan 2

N = Number of samples

Those variables are said to have interplay factor if t-test value is greater than 0,05. Hypothesis test criteria :

a. Ho is rejected : if test t $>$ 0.05, means Ha accepted.

b. Ho accepted : if test $<$ 0.05, Ha means rejected.

The hypothesis of the research as follows:

a. The null hypothesis (HO) that *mentimeter* application is not effective in enhancing the students reading skill.
b. The alternative hypothesis (H1) that *mentimeter* application is effective in enhancing the students reading skills.