CAPTER III

RESEARCH METHOD

A. Research Design

Quantitative research is used to study large populations and samples. It involves collecting data with statistical tools and analyzing data to test established hypotheses. Research with quantitative methods collects data in the form of numerical values. Next, the data consisting of these angles is examined and processed to extract some intelligence from these angles. This study conducted an associative literature analysis. The purpose of associative research is to find out how two or more variables correlate with each other. The type of research used is Quasi-Experimental research. Quasi Experiments are used to obtain information about the cause-and-effect relationship between factors manipulated by the researcher in situations where it is not possible to control all relevant variables. Research is the effort to collect and analyze data (information) in a clear, thorough, systematic, and accountable manner to obtain facts or principles. In another definition, research is also understood as the researcher's effort to test the data they have and generate new knowledge. Therefore, research is an important part of the development of science. [1]

The use this quantitative research approach is used to measure the influence of the Quizlet application on the improving student vocabulary at SMPN 14 AMBON. In this study, the control class and the experimental class

[1] M. Farhan Arib and others, 'Experimental Research Dalam Penelitian Pendidikan', *Innovative: Journal Of Social Science Research*, 4.1 (2024), pp. 5497–5511 <https://j-innovative.org/index.php/Innovative/article/view/8468>.

were randomly selected. The design used in this study is the Pretest-posttest control group design. The design and layout of the research can be described as follows.

Table 3.1 Design and Research Plan

CLASS	PRETEST	TREATMEN	POSTTEST
EXPERIMENT	O_1	X	O_2
CONTROL	O_3	-	O_4

Where:

X: Treatment implementing of learning media Quizlet Application

O_1: Pre-test of the Experimental class group

O_2 : Post-test of the experimental class group

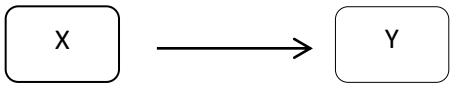
O_3 : Pre-test in the control class group

O_4: Post-test in the control class group

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1. Research Variables

In this study, there are two variables that contain dependent and independent variables, namely:



Explanation:

X: Quizlet Application

Y: English Vocabulary

The two variables in this study are:

a) Independent Variable

Independent variables are also called fundamental variables, namely variables that cause or contribute to the emergence of dependent (bound) variables. In this study, there is one independent variable, namely the Quizlet application as an influencing variable. Indicators for these variables are listed. Can be seen from the following table:

Table 3.2 Indicators of Variable X

NO.	VARIABLES	INDICATOR
1	Quizlet App	1. Use of flashcards, quizzes, and educational games in the learning process 2. How easily students can access and operate the Quizlet application 3. How often and how long students use the application during learning sessions. 4. The alignment of Quizlet content with the vocabulary topics taught in class. 5. The level of enthusiasm and active participation of students while using the application.

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b) Dependent Variable

One type of variable that is often referred to as a "dependent variable" is a variable that is affected or becomes a consequence.[2] There is only one predictor variable in this study, namely the arrival of

[2]Sugiyono, Quantitative, Qualitative and R&D Research Methods, (Bandung: Alfabeta, 2014), p. 61.

interest (Y) which acts as an effect. Indicators for this variable are listed below.

Table 3.3 Indicators of Variable Y

No.	VARIABLES	INDICATOR
1.	English Vocabulary	1.1 Stage of Recognition 1.2 Stage of passive knowledge 1.3 Stage of Active understanding 1.4 Stage of deep mastery 1.5 Stage of flexible usage

B. Data Source

1. Population

Population is a general area consisting of objects or subjects that have certain qualities and characteristics that are recorded by researchers to be studied and followed up. Therefore, the population is not only limited to humans, but also includes animals and other living things. Population also does not refer to the number of individuals in the subject or object being studied, but rather includes all the characteristics or properties possessed by the subject or object.[3] The total number of students at SMPN 14 AMBON is 1380 and the population in this study was an average of 506 eighth grade students at SMPN 14 AMBON.

[3]Sugiyono, Statistics for Education (Bandung: Alfabeta, 2013), p. 61

Table 3.4 Student Population

No	Class VIII	Total
1	VIII1	35
2	VIII2	35
3	VIII3	34
4	VIII4	34
5	VIII5	37
6	VIII6	39
7	VIII7	37
8	VIII8	35
9	VIII9	38
10	VIII10	38
11	VIII11	35
12	VIII12	35
13	VIII13	37
14	VIII14	38

2. Sample

A sample is an example of the entire population that will be studied. Purposive sampling (or purposeful sampling) is a non-probability sampling technique where researchers select respondents or subjects based on specific criteria, such as characteristics, knowledge, or experience relevant to the research objectives. Thus, the sample used in this study consists of all 50 eighth-grade students of SMPN 14 AMBON.[4]

Table 3.5 Number of student samples

No	Class	Total
1	VIII1	25
2	VIII2	25

[4] Sugiyono, 2018

The sample size in the table above was selected based on inclusion criteria relevant to the research to be conducted. These inclusion criteria are:

1. Currently enrolled as 8th grade students at the school where the research is conducted.
2. Have attended English classes for at least one prior semester.
3. Have a minimum attendance rate of 80% in English subject.
4. Have access to a digital device (smartphone/laptop) that can be used to access the Quizlet application (specifically for the experimental group).
5. Willing to participate in the entire research process (including pre-test, treatment, and post-test).

C. Research Location

1. Time

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This research was conducted in the 2025/2026 academic year, precisely in May 2025. This research will be conducted for one month. This research was conducted from May 5 to June 5, 202 Years. Therefore, focus more on the distribution of pre-tests and post-tests, study observations, and documentation as reference materials in thesis writing.

2. Place

This research was conducted at SMPN 14 AMBON which is located Jl. kebun cengkeh, kel. Batu merah kec. Sirimau. The reason the researcher chose this school as the research site is because of its strategic location. The school is also considered an excellent school with various

adequate facilities, which greatly assist in the research. Compared to other schools in the area, it stands out in terms of environment, number of students, and adequate administration. The researcher made this school the research site to provide specific insights into how the Quizlet application as a learning medium affects the improvement of students' vocabulary.

D. Data Collection

1. Pre-Test

A pretest is a measurement or test conducted before an intervention or treatment is administered to research subjects. The purpose is to determine the initial condition, baseline, or the abilities/sub variables that are intended to be changed or observed during the research. With a pretest, researchers can compare the changes after the intervention is given with the initial condition.[5]

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In this study, the pre-test was conducted using multiple-choice test questions designed according to English levels of vocabulary comprehension, ranging from the lowest to the highest.

The pretest was administered to the participants prior to the treatment in order to measure their initial ability in the target skill. The instrument consisted of 20 items, which were systematically divided into 5 levels, each containing 4 items. The test was designed based on the

[5] Capili B, Anastasi JK. An Introduction to Types of Quasi-Experimental Designs. Am J Nurs. 2024 Nov 1;124(11):50-52. doi: 10.1097/01.NAJ.0001081740.74815.20. Epub 2024 Oct 24. PMID: 39446515; PMCID: PMC11741180.

assumption that mastery of higher-level items implies mastery of the lower-level items.[6]

Each correct response was given a raw score of 1, while an incorrect response was scored 0. The total raw score, ranging from 0 to 20, was then converted into an interval scale ranging from 50 to 100 by applying a linear transformation, as follows:

Score = 50 + (Raw/times 2.5)

No	Raw Score(correct Answer	Interval Score (50-100)
1	0	50
2	1	52,2
3	2	55
4	3	57,5
5	4	60
6	5	62,5
7	6	65
8	7	67,5
9	8	70
10	9	72,5
11	10	75
12	11	77,5
13	12	80
14	13	82,5
15	14	85
16	15	87,5
17	16	90
18	17	92,5
19	18	95
20	19	97,5
21	20	100

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[6] Trianto. (2010). *Pengantar Penelitian Pendidikan*. Jakarta: Kencana Prenada Media Group

2. Treatment

Treatment in research refers to the intervention, manipulation, or condition intentionally applied to the independent variable by the researcher to observe its effect on the dependent variable. Treatments can take the form of teaching methods, therapies, strategies, policies, the use of certain tools or technologies, and more. The main goal is to determine whether the manipulation of the independent variable leads to measurable changes in the dependent variable.

This study uses a quasi-experimental design with four main sessions. In the first session, both the experimental and control groups took a pre-test to measure their initial English vocabulary skills on the topic of "Job and Occupation." Next, in the second session, the experimental group received the first treatment by learning through the Quizlet application using features such as Flashcards, Match, and Learn, while the control group studied conventionally by memorizing and discussing vocabulary with the teacher. In the third session, the second treatment was given to the experimental group by continuing to use Quizlet with the Spell, Test, and Vocabulary Quiz features, whereas the control group completed written exercises and took a quiz using traditional methods. Finally, in the fourth session, both groups took a post-test with the same material and format as the pre-test, aimed at measuring the

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improvement in vocabulary mastery after the two treatments were administered.[7]

In this study, the treatment was administered to the experimental class, which was selected based on criteria appropriate for the research objectives. The study was conducted twice with the same material, "job and occupation." This material was chosen based on the subjects in the syllabus, and the learning process was adapted to the lesson plans that had been created. The Quizlet application was used during the exploration phase, where students worked independently and were guided by the researcher. After the treatment was completed, students were then tasked with providing a conclusion.

3. Post-Test

Posttest is a measurement or test administered after an intervention (treatment) has been applied. Its purpose is to determine the state, condition, or level of performance of the subjects after receiving the treatment, so that changes due to the treatment can be assessed.[8]

To ensure that posttest measurement yields valid, reliable insights, these principles should be applied:

a. Consistency in Measurement
b. Proper Timing

[7] White, H., & Sabarwal, S. (2020). *Quasi-experimental design and methods*. UNICEF Office of Research–Innocenti.

[8] Capili B, Anastasi JK. *An Introduction to Types of Quasi-Experimental Designs*. Am J Nurs. 2024 Nov 1;124(11):50-52. doi: 10.1097/01.NAJ.0001081740.74815.20. Epub 2024 Oct 24. PMID: 39446515; PMCID: PMC11741180.

c. Same Subjects / Sample Retention
d. Control or Comparison Group
e. Equivalence at Baseline (Pretest Scores)

In this study, the post-test was conducted after the intervention/treatment was administered, which was useful for comparing the data collected before and after the intervention/treatment. The post-test deliberately used the same questions as the pre-test, including the same multiple-choice format and number of questions. This was done to compare the result of the two tests, and the data from these tests is crucial for the purpose of this research.

E. Data Analysis

Data analysis is a problem-solving method that involves using methods to extract meaningful information from incomplete data. The steps of data analysis are as follows: sorting data by type of respondents and variables; summarizing data by variables from each respondent; analyzing data from each variable analyzed; conducting research to identify underlying problems and conducting research to challenge the proposed hypothesis.[9]

1. Analysis Instrument Test

a. Validity Test

According to Siregar, validity or accuracy indicates the extent to which a measuring instrument is able to measure what it is intended to measure.[10] The validity test in this study uses the Product Moment

[9]Ibid., p. 208
[10] Yusuf Muri. *Metode penelitian kuantitatif, kualitatif dan penelitian gabungan*. Jakarta: kencana, 2014

correlation. An instrument is declared valid if the calculated correlation value (r_{hitung}) is greater than the table value (r_{table}), then the proposed statement items are declared valid. The calculation in the validity test of this instrument was conducted by the researcher using the SPSS for Windows version 20 statistical program. The instrument was given to 50 respondents, using the formula df=n-2, which is df = 50 - 2 = 48, with a significance level of 0.5, resulting in r_{table} 0.278. Thus, the items on the instrument are considered valid, and conversely, if $r_{hitung} < r_{table}$l, then the instrument is considered invalid.

The purpose of this validity test is to determine how good the measuring instrument is, and the questionnaire is the tool used to measure what needs to be measured. Determine the relationship between the total score and each question, use the Pearson Product Moment correlation technique formula. This is done to distinguish valid questions.[11]

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b. Reliability Test

The purpose of reliability is to determine how consistent the measurement results are when the measurement is conducted two or more times on the same symptom using the same measuring instrument.[12] In this study, the Cronbach's alpha formula will be used to determine the reliability of the instrument, because the research

[11] Muri Yusuf, *Metode Penelitian Kuantitatif, Kualitatif Dan Penelitian Gabungan,* (Jakarta: Kencana, 2014), hlm. 239

[12] Syofian Siregar, *Statistik Parametik Untuk Penelitian Kuantitatif*, (Jakarta: Bumi Aksara, 2017), hlm. 57

instrument is in the form of a questionnaire or list of questions with scores ranging from 1-4. The reliability of the instrument is determined using the Cronbach's Alpha formula. The Cronbach's Alpha technique is used in conjunction with the SPSS version 20 for Windows statistical program. The indicators for measuring reliability categorize the level of reliability according to the following criteria:

Table 3.6 Categorize the Level of Reliability

No.	Coefficient Interval	Relationship Level
1.	0,00-0,199	Very low
2.	0,200 - 0,399	low
3	0,400 - 0,599	moderate
4.	0,600- 0,799	strong
5.	0, 800- 1,000	Very strong

2. Analysis Data techniques

Data analysis is a problem-solving technique that encourages the use of techniques to visually represent information derived from incomplete data. The steps in data analysis are as follows: sorting data according to the type of respondents and variables; grouping data according to each respondent's variables; analyzing data from each variable analyzed; conducting research to identify consistent problems; and conducting research to support the proposed hypothesis. Data will be tested using SPSS in the process of calculating data with several stages, namely:

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a. Normality Test

The normality test is a statistical method used to determine whether a sample of data comes from a population that has a normal distribution. The normal distribution, often depicted as a bell curve, has symmetrical characteristics with the same mean, median, and mode. In the context of data analysis, the normality test is very important because many statistical methods, such as regression analysis and the t-test, assume that the data are normally distributed.

b. Homogeneity Test

Homogeneity test is a statistical method used to determine whether two or more groups of data come from populations with the same variance. This test is important as a first step before conducting further analysis, such as T-Test or ANOVA, because the results affect the validity of the analysis. After obtaining the results of the data normality test, then continued with the homogeneity of variance test.

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c. Statistical Hypothesis

Hypothesis testing in this study uses an independent sample t-test. This is done to determine the average difference between the experimental class and the control class. Experimental and control class before and after treatment on the class experiment.

1) Paired Sample T-test

A paired sample test is used when two measurements are taken from the same subject or entity, or when there is a

natural pairing between the two groups. This commonly applies to "before and after" studies.[13]

a) A significance value (2-Tailed) < 0.05 indicates a significant difference between the initial and final variables, showing a meaningful impact of the treatment differences applied to each variable.

b) A significant value (2-Tailed) > 0.05 indicates no significant difference between the initial and final variables. This shows there is no meaningful effect of the treatment given to each variable.[14]

$$t = \frac{d}{s_{d/\sqrt{n}}}$$

Where:

d = mean of the differences between paired observations

s_d= standard deviation of the differences

n = number of pairs

t = t-statistic

Hypotheses:

H_0: There is no difference in means

H_1: There is a difference in means

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[13] Montgomery, D. C., & Runger, G. C. (2014). *Applied Statistics and Probability for Engineers*. Wiley.

[14] Walpole, R. E., Myers, R. H., Myers, S. L., & Ye, K. (2012). *Probability & Statistics for Engineers & Scientists*. Pearson.

2) Independent Samples Test

An independent sample test is used to compare the means of two different and unrelated groups**.** The samples are independent, meaning observations in one group do not affect the other.[15]

a. If Sig. (2-tailed) ≤ 0.05, the difference in means between the groups is significant.
b. If Sig. (2-tailed) > 0.05, the difference in means is not significant.

$$t = \frac{X_1 - X_2}{s_p \cdot \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Where:

X_1, X_2= Sample means

s_1^2, s_2^2 = Sample variances

n_2 = Sample size

s_p = Pooled Standard Deviation

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[15] Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. Sage Publications.