CHAPTER III

METHOD AND PROCEDURES

In this chapter, the researcher would like to describe (A) Research Approach and Design (B) the Population and Sample of the Study, (C) Operational Definition, (D) the Technique for Collecting the Data, (E) Scoring Technique, (F) the Technique for Analyzing the Data, (G) Validity and Reliability

A. Research Approach and Design

The main point of this study is to investigate the use of online media (Cake Application) to increase students' vocabulary. This research uses quantitative methods to process data and to find out the results of this study. The type of research used in this study is quasi-experimental with pre-test and post-test treatments. This design was used to compare student achievement results when using a control group and an experimental group. The flow of this research is first, the control group and the experimental group both get a pre-test to analyze the students' abilities before using the actual treatment. After that, the experimental group learned vocabulary by using the Cake App as a treatment for this study. In the end, the control group and the experimental group were given a post-test to find different significant scores. This study used two classes, namely X1 IPS 2 as the control group and XI IPS 1 as the experimental group.

As stated by Hastjarjo, a quasi-experimental design consists of post-test, treatment and pre-test which has: the following formula:[1]

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[1] Dicky Hastjarjo, Rancangan Eksperimen-Kuasi, *Buletin Psikologi*, 27.2 (2019), 187–203.

Group 1	O_1	x	O_2	
Group 2	O_1		O_2	

where :

Group 1 : Experimental Group

Group 2 : Control group

O1   : Pre-test

O2   : Post-test

X   : Treatment

There are several reasons why this study used quasi-experimental dependent pre-test and post-test. First, quasi-experimental is a nonrandom task,[2] therefore this study uses two classes, there are X I IPS1 and XI IPS2 as participants and ensures students have the same knowledge before the research begins. Secondly, due to the time and cost constraints of using quasi-experimental designs, it is appropriate to use them in this study. Third, according to Sugiyono there are 2 types, namely quasi-experimental, time series and non-equivalent control design group.[3] This study used a non-equivalent control design group where the experimental group and the control

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[2]Hastjarjo Rancangan eksperimen-kuasi, *Buletin Psikologi*, 27.2 (2019), 180-200.

[3] Sugiyono, Metode Penelitian Kuantitatif Kualitatif dan R&D (Vol. 8), Alfabeta. Bandung, 2012.

group were given a pre-test before treatment and post-test was given after the experimental group received treatment to find out whether the Cake Application as a learning medium was effective or not to increase vocabulary.

The use of this media is tested to find out the desired data results. This study held several experimental group meetings to provide treatment teaching students how to increase vocabulary using the Cake App. Hopefully the use of the Cake Application as a treatment can increase students' English vocabulary skills. The research was conducted in class X I IPS1 and XI IPS2 SMA BAKTI Parit Tiga located in Parit Tiga Regency, West Bangka. The school is close to highways and residential areas that are easily accessible. This school has been adequate to support a comfortable teaching and learning process. Schools are also facilitated with projectors and loudspeakers to support the learning process.

B. Population and Sample

1. The Population

Population is a collection of individuals with predetermined qualities and characteristics. Population is not just humans but can be organizations, animals and others that have the qualities and characteristics defined by the researcher to be studied and the draw conclusions.[4]According to Kurniawan population is all respondents who general characteristics that have been identified and used

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[4] Toto Syatori Nasehudin Nanang Gozali, *Metode Penelitian Kuantitatif*, 2015.P.221

by researcher as a more accurate source.[5]

There are 2 types of population used in the study according to Kurniawan which are limited population and unlimited population. This study used a limited population because there were only three classes from SMA BAKTI Parit Tiga which were X1 IPS 1 as a control group and X1 IPS 2 as an experimental group and those two classes have the same characteristics and quantities. The amount of information of students of SMA BAKTI Parit Tiga is shown in table 2.

Table 2

Population

NO	CLASS	Number of Students
1	XI IPA 1	20
2	X1 IPS 1	28
3	XI IPS 2	27
Total		77

Source: SMA BAKTI Parit Tiga

2. The Sample of Study

The sample is part of the population with a limited number of cases. The research sample was divided into an experimental class and a control class, class Total population of 77 students, the author occupies 55 students for example:

[5] Asep Kurniawan, *Metodologi Penelitian Pendidika*n (Remaja Rosda Karya, 2018).P.282

each class consists of 28 and 27 students. The technique to choose the sample is purposive. It means that, the researcher chose purposive sampling because as stated by Fraenkel, purposive sampling is based on prior knowledge about the population and the specific goals of the study, the study uses Personal judgment for sample selection. Purposive sampling means a technique of determining a sample based on a specific objective.[6]

There are several considerations in choosing the sample of this study. So, from the three classes will take two classes as examples. Two classes were selected as samples, namely XI IPS 1 and XI IPS 2. Researcher chose both classes as samples because they have the same characteristics where, the average score of English subjects is almost the same and also both have the same major.

Table 3

The Sample of the Study

No	Class	Group	Number of the Students
1	IPS 1	Experimental	20
2	IPS 2	Control	20
Total			40

Source: SMA BAKTI Parit Tiga

C. Research Variables and Operational Definition

1. Variables

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[6] Hamid Darmadi, Metode Penelitian Pendidikan dan Sosial, *Bandung: Alfabeta*, 123 (2013).

There are two variables in this research. The first variable is independent variable (X) and the second variable dependent variable (Y).

a. Independent variable of this study is Cake Application.

b. Dependent Variable of this study is to increase vocabulary skills.

2. Operational Definition

a. Cake App: Cake App refers to the mobile app used in this study. The operational definition of the app may include a clear description of the app's features and functionality, including the teaching methods used, the user interface, the types of exercises or games provided, and the time students spend using the app.

b. Increase Vocabulary: Increasing vocabulary refers to the goals to be achieved in the use of the Cake application. Operational definitions of vocabulary improvement may include evaluation methods used to measure students' vocabulary improvement before and after application use, such as vocabulary word tests adapted from standardized tests, the number of new words mastered, or the level of understanding and use of words in context. The vocabulary test covers three types of vocabulary, namely nouns, verbs, and adjectives.

c. App Usage: App usage refers to a student's level of participation and interaction with the Cake app. The operational definition of app usage can include the amount of time students spend using the app per day or week, the level of student engagement in exercises or games provided

by the app, and an increase in the frequency of use and intensity of students accessing the app.

D. Technique of Collecting Data

As explained, this research only used test as the way to collect data instrument there was pre-test and post-test. According to Kurniawan test is a component of research that is used in research to indirectly assess ability.[7] In vocabulary test, the research used multiple choice test method. Vocabulary test was focused in word classes especially for nouns, verbs, and adjective in text. The test used are pre-test and post-testto measure students' vocabulary skills with material made from the syllabus that has been determined by the school. The following is an explanation of the process that were carried out in this study:

1. Observation

Cresswell explained that observation is the process of obtaining direct data by observing people and places during research.[8] That is, observations were made to obtain the required information. Researcher collected data by observing classroom situations and conditions during the course of teaching and learning. Researcher focused solely on student attendance, attention,

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[7] Kurniawan, *Metodologi Penelitian Pendidikan* 2018.P.43 https://repository.syekhnurjati.ac.id/3334/1/Buku%20Metodologi-min.pdf (Accessed on march,5th 2023).

[8] Michele Forinash, Qualitative Research Methods, Data Collection and Analysis: Interviews, Observations, and Content Analysis, *Dance/Movement Therapists in Action: A Working Gguide to Research Options*, 2012, 141–66.

and interaction.

2. In this study, researcher used pre-test and post-test. Before using the Cake application as a teaching tool, a pre-test is given to measure students' vocabulary skills. The study used two types of tests: two tests: one before and one after. Before teaching the learning process, a pre-test is given, and after teaching the learning process, a post-test is given. This test measures how well students can improve their vocabulary. Researcher use multiple choice because it is one of the most useful of all types of objective elements that can be built and is easy to evaluate and manage. The test consists of 26 multiple-choice questions. Researcher use nouns, verbs, and adjectives as learning outcomes.

3. Pre-test

In this phase, the pre-test was given as an introduction before using cake application as a treatment for further vocabulary learning. The test of 26 questions about daily conversation with the meaning and students canfound the right answer with 40 minutes allocated time.

4. Treatment

The researcher gave treatment to the students after doing the pre-test. And this treatment required meetings and each meeting lasted about 90 minutes. The following are some steps of the learning process:

   a. At the time before starting to provide subject matter, the researcher conveyed some motivation and reminded the students about how importance it is to learn English.

b. The researcher provided insight into the learning process.

c. The researcher asked the students to introduce themselves in front of the class.

d. The researcher explained the intent or purpose of research.

e. The researcher introduced and showed the Cake Application, then explained the functions, features and how to use the Cake Application to students.

f. The students started to practice and explored cake applications.

g. Students searched for videos related to narrative text, by typing in the keyword "Little Fox Animation".

h. Students were asked to write down and explain in front of the class what they had learned from the video.

5. Post-test

In this phase, post-test was given to students after doing treatment to learn English vocabulary using Cake Application. The results of the pre-test and post-test would be compared to found out the students' ability in learning English vocabulary. The test consists of 26 questions and students can answer question in 40 minutes.

E. Scoring Technique

This study used multiple choice questions for pre-test and post-test which had the same number and types of the question in each session. There are 2 formulas that can be used to process the data: reducing score and without reducing score. This study uses a formula without reducing score on

question that have been wrongly answered by students in pre-test and post-test.[9] The formula is drawn as follows:

$$S = \frac{Right\ answer}{3} \times Total\ score$$

In which:

Right answers = 1

Wrong answers = 0

F. The Technique for Analysis Data

After collecting the data, the next step of the study is analysis. In analyzing the data, the researcher used test, documentation, and observation.

1. Test

Data of test use statistical method. It was used to know whether or not there is a significant difference in students" vocabulary achievement between the experimental and the control group. Statistical method was used to kwon the result of the students" pre-test and post-test. To analyze the data, the researcher used SPSS (Statistical Package for Social Science). The statistical method was used by the writer was matched t-test. It was used to compare the result of post-test score and post-test score.

Husaini defined the formula as follow:[10]

a. Mean

- mean of experimental group

$$Me\ \frac{\Sigma x}{N}$$

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[9] Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R&D*. intro ,Bandung Alf, 2011, P. 143.

[10] Usman Husaini, Pengantar Statistik. (Jakarta: PT. Bumi Aksara, 2009), p. 89.

- Mean of control group

$$Me \ \frac{\Sigma y}{N}$$

- Where :

    Me   : Mean of experimental group

    Me   : Mean of control group

    N   : The number of sample

    Σ : The sum of experimental group score

    Σ :The sum of control group score

b. Standard Deviation

According to Riduwan, the research uses following formula:[11]

- Standard Deviation of experimental group

$$SD = \frac{\sqrt{\Sigma x^2 - \Sigma x)2}}{N-1}$$

- Standard Deviation of control group

$$SD = \frac{\sqrt{\Sigma y^2 - \Sigma y)2}}{N-1}$$

- where :

    Me   : Mean of experimental group

    Me   : Mean of control group

    N   : The number of sample

    Σ : The sum of experimental group score

    Σ : The sum of control group score

2. T- Test

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[11] Usman Husaini, Pengantar Statistic, p. 89.

The formula of match t-test is the following below:

$$t = \frac{\sqrt{x_1 - x_2}}{s_D}$$

- Where:

    t   : the value of t-test

    X_1 : the mean of experimental post-test

    X_2 : the mean of control group

    S_D : standard error

G. Validity and Reliability

Before giving pre-test and post-test, researcher tried out the validity and reliability of the test instrument. The try out test was given to class XI students of SMA Bakti Parit Tiga, to determine the validity and reliability of the test. Data from student trials were assessed by research. Statistical techniques are used to determine students' pre-test and post-test results. Statistical calculations are carried out in stages as follows:

1. Validity

Validity and reliability are important for measuring testing instruments. Validity is the extent to which the measurement procedure represents the concept intended, and only the intended.[12] Validity refers to the appropriateness, meaningfulness, and usefulness of the conclusions made by the study.[13] Researcher use the validity of the content. The content of the test is in accordance with the subject matter according to the syllabus. Content

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[12] Kimberly A Neuendorf, *The Content Analysis Guidebook* (sage, 2017).
[13] Jack R. Fraenkel and Norman E. *Wallen, How to Design* , p. 12.

validity is as important in assessing individual skills and competencies as merit testing.[14] Briefly, a test can be valid if the instrument can measure something according to what it is measuring. This test is used to determine students' vocabulary achievement. Before the actual test is administered, the test instrument must be tried to find out this level of validity. The test trial was conducted on students of SMAN 1 Mendo Barat class with total number of students were 30. Researcher used a try out containing 50 multiple-choice items. The trial was focused on word classes according to the school syllabus with material narrative text. There are nouns, verbs, and adjectives. It was used to identify whether students understood vocabulary achievement in class nouns, verbs, adjectives or not by analyzing test answers.

For the validity of test items, researcher calculate test results by using the Pearson correlation Product Moment formula from SPSS 26. Using the Pearson correlation product moment formula from SPSS 26, researcher must find Rxy. Researcher used the product moment correlation formula or known as the Pearson correlation. The formula is:[15]

$$R_{xy} = \frac{n(XY) - (\Sigma X) \cdot (\Sigma Y)}{\sqrt{\{n. \Sigma x^2 - (\Sigma X)^2\} . \{n. \Sigma Y^2 - (\Sigma x)^2\}}}$$

where :

R_{xy} : Coefficient correlation between variable X and Y

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[14] Ronald C Martella et al., *Comprehensive Behavior Management: Individualized, Classroom, and Choolwide Approaches* (Sage, 2011).
[15] Riduwan, *Metode dan Teknik Menyusun Tesis*, Bandung: Alfabeta, 2010.

ΣX : Item that is analyzed the validity

ΣY : Total score

N : The number of the sample

After the research got the value of *Rxy,* research used t-count formula. The formula is as follow:

$$\mathbf{t}_{\text{count}} = r\frac{\sqrt{n-2}}{\sqrt{n-r^2}}$$

Note:

t = The count score

r = Coefficient correlation of the count

n = Number of respondents

$t_{count} > t_{table}$ it means that the item is valid

$t_{count} < t_{table}$ it means that the item invalid

The result of validity test showed that from 50 questions there were only 26 questions were valid. R-table of critical value for two tailed significances of 30 students was 0,361. If t-count is higher than r-table, it is valid. It is t-count is lower than r-table, it is invalid. Then, the 26 valid test items could be used as the instrument of the test. The efficacy result was 26 valid and 24 invalid out of 50 questions. it was seen in table 4.

Table 4

The Classification of Validity Test

No	Classification	Number of Items
1	Valid	4, 6, 9, 10, 12, 13, 16, 18, 19, 20, 21, 22, 26, 28, 29, 30, 33, 34, 37, 38, 39, 40, 44, 46, 48, 49
2	Invalid	1, 2, 3, 5, 7, 8, 11, 14, 15, 17, 23, 24, 25, 27, 31, 32, 35, 36, 41, 42, 43, 45, 47, 50

2. Reliability

According to Louis, reliability is the consistency with which a measurement device gives the same result when the measurement is repeated. In another word, it is the measurement of the devices trust worthiness or dependability.[16] If the test measurement is accurate and consistent, knowable the test is reliable, a reliable test is conducted to know the consistency of the instrument as the tool of the measurement.[17] A reliable instrument is one that givens consistent results. Holandyah in Fraenkel stated that the score is considered reliable whenever the reliability coefficient of the test score should be at least 0.70 and preferably higher[18] .

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[16] Louis Cohen, Lawrence Manion, dan Keith Morrison, *Research Methods in Education* (routledge, 2017).

[17] Glenn Fulcher and Fred Davidson, The Routledge Handbook of Language Testing, (New York: Taylor & Francis Books, 2012), p. 25

[18] Holandyah, Design and Evaluating Quantitative Research in Education, (Palembang Noer Fikri Offset, 2013), p. 193.

The researcher used KR-21 as formula to find out the reliability. The formula for KR-21 is shown[19].

$$\text{KR}-21 = \frac{K}{K-1}\left[1 - \frac{\bar{x}(K-\bar{x})}{KS^2}\right]$$

This formula is based on the mean of sample and the number of items. Here, K is the number of items in the test, is the mean of sample, and s^2 is the variance of the sample. The score was obtained by using Cronbach Alpha, SPSS 26 (Statistical Package for the Social Science).

The researcher used the reliability category which can be seen in the following table by Cohen, Manion, & Marrison.[20]

Table 5

Reliability Category

NO	Reliability	Category
1	>0.90	Very high reliable
2	0.80-0.90	Highly reliable
3	0.70-0.79	Reliable
4	0.60-69	Minimal reliable
5	<0.60	Unacceptably low reliable

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[19] Riduan, Metode dan Teknik…, p.120.
[20] L Cohen, L Manion, dan K Morrison, Research Methods in Education (Sixth Editionth ed.), *Abingdon, Oxon OX14 4RN: Routledge-Taylor and Francis e-Library. ISBN*, 13 (2007), 970–78.

The test is reliable, if its measurement is consistent and accurate. The researcher computed its reliability by using Statistical Package for Social Science (SPSS 26) with Cronbach Alpha Formula. From the calculation, the result of Cronbach Alpha was 0,821(Highly reliable). This result higher than r table Spearman Rho Correlation = 0,361 it means that the instrument is reliable and could be used for pre-test and post -test.