CHAPTER 3

METHODOLOGY

This chapter presents the methodology of the study which covers research design, population and samples, research hypothesis, research instruments, data collection and data analysis.

This study aimed to disclose the ICT effects on students' vocabulary mastery in junior high school and the study is guided by the following research questions:

1. Does the Wiki affect the students' vocabulary mastery in EFL class?
2. How significant is the effect of ICT based learning on the students' achievement in EFL class in junior high school?

3.1 Research Design

The design of this research is a quasi-experiment study. To investigate whether ICT-based learning affects the students' vocabulary mastery or not, we need two groups. Freankel *et al*., (2012) stated that these two groups are: an experimental group where the treatment was conducted and a control group which was observed whether the class runs on regular course curriculum or not. Also, Hatch & Farhady (1982) said that a pre-test and a post-test are carried out in both groups. The experiment took overall seven meetings (each session 80 minutes).

The frame design of quasi-experimental used in this research is based on freankel *et al.,* (2012):

Table 1 Framework of research

GROUP 1	X	01
GROUP 2	C	01

<div align="right">Freankel <i>et al,</i> (2012)</div>

Group 1= experimental class

Group 2= control class

01= vocabulary ability

01=vocabulary ability

3.2 Population and samples

In the present study, the population was 125 seventh graders covered five classes at a junior high school in Bandung. It was selected due to, based on the curriculum seventh graders starting learning in a very formal way and learning the foundation of English for the first time and hence, involved with the new daily vocabularies.

The samples of the present study covered two classes, e.g. experimental group and control group. According to freankel *et al.,* (2012), a sample in research is the group on which information is obtained, and the population is called sample the interest group which the author like to generalize the result of the study. Hence, these two classes are purposive sampling and have the same proficiency level of the English. Further, they had been chosen based on the teacher recommendations. These two classes are 7C and 7D that both of them are consisting of 25 students. 7C is the experimental class, and 7D is the control class.

3.2.1 Experimental group

According to Freankel *et al.,* (2012) experimental group receives treatment. In this present study, the experimental class was 7C of Lab junior high school in Bandung; the class contained 25 students who had the similar ability in vocabulary with Control class.

To achieve the goal of the study, the experiment took seven sessions (each session 80 minutes). In each session, the teacher called the students at the computer lab to have the lesson. The class ran based on the lesson plan. The researcher played the role of a teacher. The teacher applied ICT-based learning an online learning platform called wiki. Before starting the experiment, the teacher has given the following instructions to the students:

a. Each student should have an email address.
b. Students should sign into the wiki and send the request.
c. Students should read the instruction and guideline given by teacher on the Wiki.
d. Students should come to the computer lab in each session.

Further, in order to learn the vocabulary of the related theme effectively, the teacher applied the Marzano (2004) vocabulary learning strategies (Scurletis, 2009) which include six steps to effective vocabulary instructions:

a. The teacher explains new words-going beyond reciting the definition.
b. Students restate and explain the new word in their words.
c. Students are creating a nonlinguistic representation of the word.

d. Students engage in activity to deepen their knowledge of the new word.

e. Students discuss the new words.

f. Students play games and doing some activities to review new vocabulary.

Besides, the teacher has assigned the students to do homework on the wiki and prepare themselves for the next session.

3.2.2 Control group

In contrast, the control group receives no treatment (freankel *et al.,* (2012). The control class was 7D of Lab junior high school, Bandung. The class took seven meetings similar to the experimental class. A week before starting class, a Pre-test was given to the students and at the end; a post-test was given to them. Similarly, the control class was consisting of 25 students. The class normally performed as a static class that focused on vocabulary improvement of the students. The researcher has observed the class to see whether the class runs on a normal and regular class curriculum or not. The result of the control class in the study is analyzed by comparing the test with the result of the experimental class.

3.3 Research hypothesis

Based on freankel *et al.,* (2012) hypothesis is "a prediction of the possible outcome of the study." Moreover, Hatch & Farhady (1982) said that null hypothesis (H0) prediction is neither negative nor positive between two variables. Hence, the first hypothesis should be null later turn into the alternative. Hypothesis used in this research as follows:

Ho = means there will not be any significant difference between students vocabulary score in pre-test and post-test, this means that ICT will not have any effect on student's vocabulary mastery.

3.4 Research instruments

To answer the research questions, Pre-test and post-test as a vocabulary test were the instruments in this study. While treatment was employed in the experiment class. Control class was observed by the researcher to see whether the class runs on a normal and regular class curriculum or not.

3.4.1 Pre-test

The pre-test was the first step to be applied to both classes in the study. The purpose of the pre-test was to assess students' ability in vocabulary and achieve the data in both classes before employing the treatment to show that students of both groups have the same ability in the vocabulary. The pre-test was multiple choice questions that include 35 questions related to the theme of teaching in the class.

3.4.2 Post-test

Post-test was similar to pre-test. It happened after the treatment at the end of learning sessions in both groups to see and measure students' ability in vocabulary mastery. The post-test intention was to find out the differences between each groups' score. The test included 35 multiple choice questions.

3.4.3 ICT-based learning: Wiki

The teacher applied ICT-based learning which is an online learning platform called Wiki. It is a webpage that can be viewed by everyone and easy access to the internet and possible to extend, open-ended and collaborative group sites and based on (Parker and Chao, in Aydin, 2014) "wikis are dynamic and constantly changing web-based environments where readers are authors and editors, and the format allows multiple users to upload, build, and create content and global communities".

The teacher has given the following instructions to the students before starting the lesson on Wiki:

e. Each student should have an email address.

f. Students should enter to the wiki and send the request.

g. Students should read the instruction and guideline given by teacher on the Wiki.

h. Students should come directly to the computer lab in each session.

Further, to learn the vocabulary of the related theme effectively, the teacher applied the Marzano (2004) vocabulary learning strategies (Scurletis, 2009) which include six steps to effective vocabulary instructions:

a. The teacher explains new words-going beyond reciting the definition.

b. Students restate and explain the new word in their words.

c. Students are creating a nonlinguistic representation of the word.

d. Students engage in activity to deepen their knowledge of the new word.

e. Students discuss the new words.

f. Students play games and doing some activities to review new vocabulary.

Besides, the teacher has assigned the students to do homework on the wiki and prepare themselves for the next session.

3.4.4 Validity and reliability of the tests

The try-out test was conducted to measure the validity, the reliability and difficulty index of the instrument. The try-out test was consisting of fifty multiple choice questions. Besides, the formula applied in scoring system is formula without punishment based on Arikunto (2006). The formula is the following:

S=R

S: Score

R: right answer

According to Hatch & Farhady (1982) validity is used to assess the degree and level of the quality of the instrument. In this research, the data was calculated by using SPSS 16.0 to check the validity of the test. The criteria used for validity are in the following Table below:

Table 2 Category of Coefficient Correlation of validity

Raw Score	Interpretations
0.80-1.00	Very High

0.60-0.80	High
0.40-0.60	Moderate
0.20-0.40	Low
0.00-0.20	Very low
	(Arikunto, 2006)

Based on the Table, the criteria above used for validity expose whether the instrument is valid or not.

Further, According to Hatch and Farhady, (1982) "Reliability is the extent to which a test produces consistent results when administered under similar condition." This study used SPSS 16.0 for windows to expose the items' reliability. It was used to make sure whether or not the test is reliable to be used in Pre-test or Post-test or not. The criteria of reliability are in the below Table.

Table 3 Category of Coefficient Correlation of Reliability

Coefficient Correlation	Interpretation
0.0-0.20	Low
0.20-0.40	Moderate
0.40-0.70	High
Above 0.70	Very High
	(Aritkunto, 2006)

The criteria above used for the reliability reveal whether the instrument is reliable or not.

Moreover, According to Arikunto (2006), the level of difficulty in a research investigates the appropriateness and relevance of the test items to the participants' ability. It means that whether the test is too easy or difficult for the members. The criteria used for the difficulty index are in the Table following:

Table 4 Criteria of Difficulty index

Index of Difficulty	Interpretation
0.00-0.30	Difficult
0.30-0.70	Moderate
0.70-1.00	Easy

3.5 Data collection

Moreover, to collect the data and assess the student's ability in vocabulary mastery, Pre-test and Post-test were given to students' at starting and end of the learning session. The Table below is the diagram:

Table 5 Diagram of the data collection

T1	X	T2
T1	C	T2

Adapted from freankel *et al.,* (2012)

Based on the frame above, both classes were conducted pre-test before the treatment and a post-test after the treatment at the end of learning sessions.

T1= Pre-test for vocabulary mastery.

T1= pre-test for vocabulary mastery.

X= experiment

C= control

T2= Post-test for the Vocabulary mastery.

T2=Post-test vocabulary mastery.

3.6 Data analysis

Relatively, after collecting output data such as pre-test and post-test. The next step is to analyze the data. Normal distribution test and Independent t-test were used to analyze the output data to see whether there is a significant difference between the mean of the participants before and after the treatment or not. It is discussed below in details:

3.6.1 Normal Distribution Test

Beside, to analyze the normal distribution, the data were calculated by using SPSS 16.0 for Windows. In this study, Kolmogorov-Smirnov formula was used. Different steps were followed in testing the normal distribution, for instance:

a. The alpha level was at 0.05 (two-tailed test).

b. The null hypothesis (H0) was that the score of the sample was distributed normally.

c. The alternative hypothesis (HA) was that the score of the sample was not distributed normally.

Furthermore, to compare the significances differences of the result, the level of the significance was 0.05. It means that if the level of the significance>0.05 the distribution of the sample is not significantly different from the normal distribution. In this case, the null hypothesis will not be rejected. Thus, if the significant level is <0.05, then it shows that the distribution is significantly different from the normal distribution (Hatch & Farhady, 1982).

3.6.2 The independent t-test

Besides, the result of pre-test and post-test was analyzed by the dependent t-test. Independent t-test was used to compare the differences in the mean scores of the two tests whether the differences are significant or not (Hatch & Farhady, 1982). Therefore, SPSS 16.0 for windows is used to analyze the independent t-test. In the first step, the t value ($t_{obtained}$) was found. Second, the t value was compared with t ($_{critical}$). Here, if the $t_{obtained} \geq t_{critical}$ at the (p) =0.05, it means that null hypothesis (H_0) is rejected and will accept the alternative hypothesis (H_A). In contrast, if the $t_{obtained} < t_{critical}$, the null hypothesis is not rejected but accepted (Hatch & Farhady, 1982).

3.7 Research Procedure

The research procedure comprised administrating the pilot-test, managing the pre-test, conducting treatment, manage the post-test.

3.7.1 Administrating the pilot-test

Before starting the study, a pilot-test or try-out was managed by the researcher to find out the validity, reliability, difficulty, and discrimination of the instrument items.

Pilot-test included fifty multiple choice items. The test was distributed to one class of grade 7th consist of 25 students of lab school, UPI, Bandung. The respondent of the pilot-test had the same level as experimental and control class.

3.7.2 Conducting the Treatment

The teacher applied ICT-based learning an online learning platform called wiki. The teacher has given the following instructions to the students before starting the lesson on Wiki:

i.   Each student should have an email address.

j.   Students should enter to the wiki and send the request.

k.   Students should read the instruction and guideline given by teacher on the Wiki.

l.   Students should come directly to the computer lab in each session.

Further, to teach the vocabulary of the related theme effectively, the teacher applied the Marzano (2004) vocabulary learning strategies (Scurletis, 2009) which include six steps to effective vocabulary instructions:

a. The teacher explains new words-going beyond reciting the definition.

b. Students restate and explain the new word in their words.

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d.   Students engage in activity to deepen their knowledge of the new word.

e. Students discuss the new words.

f. Students play games and doing some activities to review new vocabulary.

Besides, the teacher has assigned the students to do homework on the wiki and prepare themselves for the next session.

3.7.3 Managing the pre-test and Post-test

The pre-test was given to students to investigate the students' prior knowledge about their vocabulary ability in both groups and to make clarify having the same level of ability. After the pre-test, students were given treatment in experiment group for several meetings; it is to see the ICT based learning effects on students' vocabulary mastery. At the end of the learning sessions, students are given a post-test to both groups to evaluate their ability in vocabulary. Furthermore, the post-test was given to see the significant differences in students' achievement in both classes before and after the treatment. Moreover, the form of the pre-test and post-test was multiple choice questions which were consist of the valid items of the pilot-test.